APPENDIX K.2 **OPERATING UNIT 2 (OU-2) REMEDIAL ACTION PLAN (1 OF 5)**

Geosyntec consultants

engineers | scientists | innovators

FINAL FEASIBILITY STUDY/ REMEDIAL ACTION PLAN (FS/ RAP)

BRISBANE BAYLANDS OPERABLE UNIT 2 BRISBANE, CALIFORNIA

Universal Paragon Corporation
150 Executive Park Boulevard, Suite 4000
San Francisco, California 94134

Prepared by

Geosyntec Consultants, Inc.
1340 Treat Boulevard, Suite 208
Walnut Creek, California 94597

Project Number: WG2556

22 December 2021

Geosyntec consultants

Final Feasibility Study/Remedial Action Plan (FS/RAP)

Brisbane Baylands Operable Unit 2
Brisbane, California

Prepared for

Universal Paragon Corporation
150 Executive Park Boulevard, Suite 4000
San Francisco, California 94134

Prepared by

Geosyntec Consultants, Inc.
1340 Treat Boulevard, Suite 208
Walnut Creek, California 94597

Anthony Smith, Ph.D., P.E. (CA)
Senior Engineer

Krzysztof S. Jesionek, P.E. (CA)
Principal Engineer

Randolph C. Brandt, P.G. (CA)
Senior Principal Geologist





Project Number: WG2556

22 December 2021

Geosyntec consultants

TABLE OF CONTENTS

EXECUTIVE SUMMARY 1

1. INTRODUCTION 1
   1.1 Purpose of this Feasibility Study/Remedial Action Plan 1
   1.2 FS/RAP Organization 1
   1.3 Regulatory Framework 3
      1.3.1 Summary of Orders and NCP Framework 3
      1.3.2 Historical NPL Evaluation (200 Industrial Way) 4
   1.4 Anticipated Brisbane Baylands Development 4
   1.5 Development Project Schedule 4

2. SITE BACKGROUND 5
   2.1 Site Description 5
   2.2 Historical Use Summary 5
      2.2.1 Former Railyard 5
      2.2.2 Industrial Way Properties 6
   2.3 Site Characteristics 8
      2.3.1 Topographic Conditions 8
      2.3.2 Surface Water Hydrology 8
      2.3.3 Local Geology 9
   2.4 Site Hydrogeology 10
   2.5 Groundwater Use 10
   2.6 Former Railyard Investigation History 11
      2.6.1 Environmental Assessment of Fill – 1982 11
      2.6.2 Soil and Groundwater Investigation – 1985 11
      2.6.3 Remedial Action Alternative Feasibility Study: Field Investigations – 1986 12
      2.6.4 Groundwater Monitoring Program – 1989 12
      2.6.5 Groundwater Monitoring – 1989 12
      2.6.6 Remedial Investigation Data Study – 1989 12
      2.6.7 Supplemental Remedial Investigation – 1990 13
      2.6.8 Additional Site Characterization – 1997 14
      2.6.9 Groundwater Plume Stability Evaluation – 1998 14
      2.6.10 Remedial Action Plan – 1999 15
      2.6.11 Supplemental Bunker C Delineation – 2001 16
      2.6.12 Revised RAP – 2002 16
      2.6.13 Chlorinated Solvent Investigation Report – 2002 16
      2.6.14 OU-2 Additional Investigation in Area of CVOC Plume – 2007 17

2.6.15 Groundwater and Surface-Water Monitoring Summary – 2019 17
2.7 Industrial Way Properties Investigation History 18
2.7.1 UST Removal from 250 Industrial Way – 1988 18
2.7.2 UST Removal from 285 Industrial Way – 1991 18
2.7.3 UST Removal from 350 Industrial Way – 1991 18
2.7.4 Soil Investigation – 1991 18
2.7.5 Soil Quality Assessment – 1992 19
2.7.6 Soil and Groundwater Investigation – 2008 19
2.8 Data Gap Investigation – 2019 19
2.9 Site Remediation History 20

3. NATURE AND EXTENT OF CONTAMINATION 21
3.1 Fill Soil 21
3.1.1 Metals 21
3.1.2 Polynuclear Aromatic Hydrocarbons 22
3.1.3 Total Petroleum Hydrocarbons 23
3.1.4 Organochlorine Pesticides 24
3.1.5 Polychlorinated Biphenyls 25
3.1.6 Volatile Organic Compounds 25
3.1.7 Asbestos 26
3.1.8 Pentachlorophenol 26
3.2 Soil Vapor 27
3.3 Groundwater 27
3.3.1 Dissolved Metals 27
3.3.2 Semi-Volatile Organic Compounds 28
3.3.3 Total Petroleum Hydrocarbons 29
3.3.4 Volatile Organic Compounds 29
3.4 Surface Water 30

4. SITE-SPECIFIC HEALTH RISK ASSESSMENT 32
4.1 Baseline HRA 32
4.1.1 Future Commercial/Industrial/Retail Worker 34
4.1.2 Future Resident 35
4.1.3 Future Construction Worker 35
4.1.4 Offsite Receptors 36
4.1.5 Aquatic Receptors 36
4.1.6 HRA Summary 37
4.2 Media-Specific Cleanup Levels 38

4.2.1 Soil....38
4.2.2 Groundwater....39
4.2.3 Soil Vapor....40
4.3 Application of Cleanup Levels....42

5. REMEDIAL ACTION OBJECTIVES....43
5.1 Site Remedial Action Objectives....43
5.2 Applicable or Relevant and Appropriate Requirements....43

6. FEASIBILITY STUDY AND ALTERNATIVES ANALYSIS....45
6.1 Remedial Technology Screening....45
6.1.1 General Response Actions....45
6.1.2 Remedial Technology Screening....46
6.2 Remedial Alternatives Development and Evaluation....47
6.2.1 Description of Evaluation Criteria....47
6.3 Description of Remedial Action Alternatives....49
6.3.1 Alternative 1 — No Action....50
6.3.2 Alternative 2 — Land Use Restrictions / Engineering Controls for Vapor Intrusion Mitigation / Monitored Natural Attenuation....50
6.3.3 Alternative 3 — Land Use Restrictions / Engineering Controls for Vapor Intrusion Mitigation / Soil Capping / Excavation with Relocation and/or Offsite Disposal / In Situ Groundwater Treatment and Monitoring / Optional Ex Situ Soil Treatment....51
6.3.4 Alternative 4 – Land Use Restrictions, Engineering Controls for Vapor Intrusion Mitigation, Complete Excavation with Offsite Disposal and Restoration to Original Grade, and In Situ Groundwater Treatment and Monitoring....53
6.4 Summary Evaluation and Comparative Analysis of Remedial Action Alternatives....54
6.4.1 Threshold Criteria....54
6.4.2 Balancing Criteria....55
6.4.3 Modifying Criteria....58
6.4.4 Additional HSC Criteria....58
6.5 Alternatives Screening Results....58

7. PREFERRED REMEDIAL ALTERNATIVE....59
7.1 Soil Assessment Following Demolition of Existing Buildings....60
7.2 Decommissioning of Existing Groundwater Monitoring Wells....60
7.3 Excavation with Partial Onsite Relocation and Partial Offsite Disposal of Soils....60
7.4 Excavation and Onsite Ex Situ Treatment and Relocation of Soils....61
7.5 Placement of Soil Cap....61

7.6 Groundwater Remediation Program....62
7.7 Groundwater Monitoring Program....62
7.8 Soil Vapor Intrusion Evaluation....62
7.9 Land Use Restrictions....63
7.10 O&M....64

8. SCHEDULE....65

9. REFERENCES....66

LIST OF TABLES

Table 1: Groundwater Well and Piezometer Construction Details

Table 2: Metals Concentrations in Soil

Table 3: Polynuclear Aromatic Hydrocarbon and Total Petroleum Hydrocarbons as Diesel and Motor Oil Concentrations in Soil

Table 4: Organochlorine Pesticides and Polychlorinated Biphenyls Concentrations in Soil

Table 5: Volatile Organic Compounds and Total Petroleum Hydrocarbons as Gasoline Concentrations in Soil

Table 6: Groundwater Elevations in Fill Water-Bearing Zone, December 2018

Table 7: Dissolved Metals Concentrations in Fill Groundwater

Table 8: Polynuclear Aromatic Hydrocarbon and Total Petroleum Hydrocarbons as Diesel and Motor Oil Concentrations in Fill Groundwater

Table 9: Volatile Organic Compounds and Total Petroleum Hydrocarbon Concentrations as Gasoline in Fill Groundwater

Table 10: Potentially Applicable or Relevant and Appropriate Requirements (ARARs)

Table 11: Remedial Technology Screening Matrix

Table 12: Comparative Analysis of Remedial Alternatives

LIST OF FIGURES

Figure 1: Site Location Map

Figure 2: Site Plan and Well Locations

Figure 3a/b: Geologic Cross-Sections

Figure 4: Fill Groundwater Elevation Contours (December 2018)

Figure 5: Soil Sample Locations

Figure 6: Arsenic Concentrations in Soil

Figure 7: Lead Concentrations in Soil

Figure 8: Benzo(a)pyrene Equivalent Total PAHs Concentrations in Soil

Figure 9: Naphthalene Concentrations in Soil

Figure 10: Petroleum Hydrocarbon Concentrations in Soil (TPH-d)

Figure 11: PCB Concentrations in Soil

Figure 12: Maximum Chlorinated VOC Concentrations in Soil

Figure 13: Groundwater Sample Locations

Figure 14: Dissolved Arsenic, Lead, Copper, and Nickel Concentrations in Fill Groundwater

Figure 15: Petroleum Hydrocarbon Concentrations in Fill Groundwater

Figure 16: Benzene, Ethylbenzene, Total Xylenes, and Naphthalene Concentrations in Fill Groundwater

Figure 17: Chlorinated VOC Concentrations in Fill Groundwater

Figure 18: Elements of Alternative 3

Figure 19: Conceptual Cross-Section of Redevelopment with Alternative 3

Figure 20: Soil Excavation Plan – Alternative 4

LIST OF APPENDICES

Appendix A: Information Submittal, Industrial Way Properties
Appendix B: Data from Historical Site Investigations
Appendix C: Brisbane Baylands OU-2 Data Gap Investigation Report
Appendix D: Baseline Health Risk Assessment
Appendix E: Estimated Cost Summary Tables for Remedial Alternatives
Appendix F: OU-2 Soil Import Criteria
Appendix G: Administrative Record List
Appendix H: Responsiveness Summary
Appendix I: Statement of Reasons and Preliminary Non-Binding Allocations of Responsibility

ACRONYMS AND ABBREVIATIONS

µg/kg	micrograms per kilogram
µg/L	micrograms per liter
µg/m^3	micrograms per cubic meter
ARARs	Applicable or Relevant and Appropriate Requirements
ATSDR	Agency for Toxic Substances and Disease Registry
B&M	Burns and McDonnell Waste Consultants, Inc.
BaP	benzo(a) pyrene
BBOU-2	Brisbane Baylands Operable Unit 2
bgs	below ground surface
Brisbane Baylands	see “the Site”
BTEX	benzene, toluene, ethylbenzene, and xylenes
Cal-EPA	California Environmental Protection Agency
Caltrain	The Peninsula Corridor Joint Powers Board
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
cis-1,2-DCE	cis-1,2-dichloroethene
COCs	chemicals of concern
COPCs	chemicals of potential concern
CUL	cleanup level
CVOCs	chlorinated volatile organic compounds
DTSC	California Department of Toxic Substances Control
EPC	exposure point concentration
ESLs	Environmental Screening Levels
FS/RAP	Feasibility Study/Remedial Action Plan
ft/ft	feet per foot
Geosyntec	Geosyntec Consultants, Inc.
GRAs	general response actions
HCI	Hydrologic Consultants, Inc.
HDPE	high density polyethylene
HI	hazard index

HLA	Harding Lawson Associates
HQ	hazard quotient
HRA	Health Risk Assessment
HSC	California Health and Safety Code
HVOCs	halogenated volatile organic compounds
I&SE	imminent and substantial endangerment
LBNL	Lawrence Berkeley National Laboratory
MACTEC	MACTEC Engineering and Consulting, Inc.
MCL	Maximum Contaminant Level
MDL	method detection limit
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
msl	mean sea level
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NGVD29	National Geodetic Vertical Datum of 1929
NPL	National Priorities List
O&M	operations and maintenance
OBM	Old Bay Mud
OBMD	Old Bay Margin Deposits
OBMD-SU	Old Bay Margin Deposit Sand Unit
OCPs	organochlorine pesticides
OEHHA	Office of Environmental Health Hazard Assessment
OPC-SAT	California Ocean Protection Council Science Advisory Team
OSWER	Office of Solid Waste and Emergency Response
OU	operable unit
PAHs	polynuclear aromatic hydrocarbons
PCBs	polychlorinated biphenyls
PCE	tetrachloroethene
PCP	pentachlorophenol
PM_{10}	particulate matter 10 microns or smaller
RAOs	Remedial Action Objectives

RAP	Remedial Action Plan
RCRA	Resource Conservation and Recovery Act
RDIP	Remedial Design and Implementation Plan
RIDS	Remedial Investigation Data Study
RL	reporting limit
RWQCB	San Francisco Bay Regional Water Quality Control Board
Site	Brisbane Baylands Operable Unit 2 (also known as former Southern Pacific Brisbane Railyard Operable Unit 2 and Industrial Way Properties)
SMP	Soil Management Plan
SPTC	Southern Pacific Transportation Company
SRI	Supplemental Remedial Investigation
SVOCs	semi-volatile organic compounds
SWPPP	Storm Water Pollution Prevention Plan
T&R	Treadwell and Rollo
TBC	To-be-Considered Requirement
TCE	trichloroethene
TDS	total dissolved solids
TEQ	toxic equivalency
TPH	total petroleum hydrocarbons
TPH-d	total petroleum hydrocarbons as diesel
TPH-g	total petroleum hydrocarbons as gasoline
TPH-mo	total petroleum hydrocarbons as motor oil
trans-1,2-DCE	trans-1,2-dichloroethene
TSCA	Toxic Substances Control Act
UCL	upper confidence limit
UPC OU-SF	San Francisco County portion of Universal Paragon Corporation Operable Unit
UPC OU-SM	San Mateo County portion of Universal Paragon Corporation Operable Unit
UPC	Universal Paragon Corporation
USEPA	United States Environmental Protection Agency
UST	underground storage tank
UTL	upper tolerance limit

VOCs	volatile organic compounds
Weiss	Weiss Associates, Inc.
YBM	Young Bay Mud
YBMD	Young Bay Margin Deposits

EXECUTIVE SUMMARY

This Feasibility Study/Remedial Action Plan (FS/RAP) was prepared by Geosyntec Consultants, Inc. (Geosyntec) on behalf of Universal Paragon Corporation (UPC) to address soil, soil vapor, and groundwater contamination at the former Southern Pacific – Brisbane South Area site and Industrial Way Properties in Brisbane, California (the Site). The Site is part of a larger group of properties under environmental investigation/remediation that have been designated as operable units (OUs) under agreements with the California Department of Toxic Substances Control (DTSC) and the San Francisco Regional Water Quality Control Board (RWQCB). The Site is referred to as OU-2 and the RWQCB is the lead regulatory agency.

The Site is approximately 130 acres and occupies the southern portion of the former Southern Pacific Transportation Company (SPTC) Brisbane Railyard, which was used as a railroad switching yard from approximately 1907 to 1982 [Lipps, 2013]. After 1982, the railyard was unused. In 1989, Tuntex, USA (now known as UPC) purchased the property. The Site also includes properties along Industrial Way which have been occupied by various commercial/industrial tenants over the last approximately 100 years. The Site is included as a portion of a larger mixed-use development project known as the Brisbane Baylands Development, which will include housing, commercial businesses, civic uses, and public open space. UPC is the master developer for OU-2.

Numerous environmental investigations have been conducted at the Site since 1982 to characterize the presence, nature, and extent of contaminants resulting from historical operations. Investigations have identified metals (primarily arsenic, lead, and mercury); polynuclear aromatic hydrocarbons (PAHs); organochlorine pesticides (OCPs); polychlorinated biphenyls (PCBs); chlorinated volatile organic compounds (CVOCs); and petroleum hydrocarbons, including Bunker C oil, gasoline-range hydrocarbons (TPH-g), diesel-range hydrocarbons (TPH-d), and motor oil-range hydrocarbons (TPH-mo) as chemicals of potential concern (COPCs).

Site remediation completed to date includes the removal of underground storage tanks (USTs) and the safe removal of hydrocarbon-impacted soil associated with the USTs adjacent to Industrial Way.

A Baseline Health Risk Assessment (HRA) for the Site was conducted for the COPCs that were identified during the investigations conducted at the Site. The HRA was prepared under the conservative assumption that no remediation or mitigation would be implemented. The HRA used this assumption to evaluate potential risks to current and future populations that could be exposed to COPCs at the Site under different land use scenarios. The results of the HRA found that present conditions are protective for current Site users, but under different scenarios, future commercial/industrial workers, construction workers, and residents could be at risk if remediation were not conducted. The HRA concluded that action to remediate or mitigate potential exposure to COPCs in soil and soil vapor is warranted to protect future users under a high intensity, mixed-use redevelopment scenario.

The HRA was used as the basis to establish Remedial Action Objectives (RAOs) for the Site. RAOs are site-specific, quantitative goals that define the extent of cleanup required to achieve the

appropriate level of protectiveness for human health and the environment. The RAOs for the Site include:

- Soil – Prevent exposure to soil with COPCs at concentrations exceeding cleanup levels (CULs) by eliminating the exposure pathway for future Site users including the incidental ingestion, inhalation of windblown dust particles, and dermal contact exposure pathways.
- Soil Vapor – Prevent exposure to volatile organic compounds (VOCs) in soil vapor at concentrations that exceed the CULs for soil vapor by blocking or minimizing the vapor intrusion pathway;
- Groundwater – Prevent exposure to VOCs in groundwater by eliminating inhalation risks through the vapor intrusion pathway, preventing ingestion and dermal contact through the use of groundwater for potable and agricultural purposes.

To identify the most appropriate remedy for achieving the RAOs for the Site, four remedial alternatives were developed and analyzed in detail pursuant to the nine criteria of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) and the six criteria of Section 25356.1 of the California Health and Safety Code (HSC). A comparative analysis of the alternatives identified the advantages and disadvantages of each alternative when compared to other alternatives. Redevelopment activities that would serve to eliminate pathways of exposure for future Site users (e.g., the placement of up to 30 feet of fill over existing soils) were integrated into the remedial technology screening and development of remedial alternatives.

Based on the evaluation and comparison of the four alternatives, Alternative 3 was identified as the preferred remedial alternative for implementation at the Site. Alternative 3 includes capping of impacted soils, excavation with partial offsite disposal and partial onsite relocation, and land use controls. More specifically, this alternative includes:

- Capping of soil in portions of the Site that contain COPCs at concentrations exceeding CULs. Capping includes placement of clean soil, building foundations, roads, parking pavement, or other hardscape over the existing or future land surface;
- Excavation of soil in portions of the Site that contains COPCs at concentrations exceeding CULs and where capping is not possible. Some excavated soil will be off-hauled and disposed of offsite and some soil will be relocated onsite and capped. As an option to excavation, onsite treatment and reuse of soil containing potentially mobile petroleum hydrocarbons may be conducted;
- Treatment of CVOC-impacted groundwater and post-remediation groundwater monitoring;
- Land use controls consisting of the following components:
  - Soil vapor mitigation systems as part of future building construction, if required based on a soil vapor intrusion evaluation that will be conducted after mass grading and prior to building construction. This evaluation will consist of a multiple lines of evidence approach, including estimating the time that future soil vapor

concentrations will reach steady state at different depths in the imported soil by the method of Johnson et al. [1999] and field testing to establish a depth-specific soil vapor profile. The evaluation will be conducted in accordance with current RWQCB soil vapor guidance. The detailed evaluation will be specified in the Remedial Design and Implementation Plan (RDIP);

  - Land use restrictions including administrative actions and engineered actions;
- Ongoing operation and maintenance of caps and any engineered systems such as soil vapor mitigation systems.

After approval of the FS/RAP by the RWQCB, UPC will submit for RWQCB review and approval one or more RDIPs. Following completion of remediation activities, which may be completed in phases, UPC will submit to RWQCB one or more Remedial Action Completion Reports documenting the implementation of remediation activities and noting any deviations from the approved plan(s). The completion report(s) will include a post-remediation risk assessment that will evaluate the overall effectiveness of the remediation. The completion reports will also provide the technical basis for any mitigation measures (such as soil vapor mitigation systems) to ensure the long-term protection of human health. Soil vapor assessment and vapor mitigation design and implementation will occur prior to and as part of building construction and will also be conducted with oversight by the RWQCB.

1. INTRODUCTION

This Feasibility Study/Remedial Action Plan (FS/RAP) was prepared by Geosyntec Consultants, Inc. (Geosyntec), on behalf of Universal Paragon Corporation (UPC), for submittal to the California Regional Water Quality Control Board, San Francisco Bay Region (RWQCB) to address the requirements of Imminent and/or Substantial Endangerment (I&SE) Order and Remedial Action Order I&SE 89/90-004, which was issued by the California Department of Toxic Substances Control (DTSC) in 1990 and formally transferred to the RWQCB in 1995. This FS/RAP integrates mixed-use development with site remediation and mitigation elements. Following implementation, these measures will be protective of a high-density residential, commercial/industrial, retail, and recreational open space project.

This FS/RAP describes the preferred remedial actions for soil and groundwater at the Brisbane Baylands Operable Unit 2 (OU-2 or BBOU-2), located in Brisbane, California (the Site) (**Figure 1**). The remedial actions described in this FS/RAP were selected to address contaminated soil and groundwater at the Site and are based on the remedies developed to meet Remedial Action Objectives (RAOs) for redevelopment and occupancy of the Site.

1.1 Purpose of this Feasibility Study/Remedial Action Plan

The purpose of this FS/RAP is to identify the preferred remedies for the Site by assessing Site information and potential remedial alternatives through compliance with the provisions of the California Health and Safety Code (HSC) Section 25356.1. This FS/RAP provides the following components specified in the California Environmental Protection Agency, DTSC Guidance Document No. EO-95-007-PP, Remedial Action Plan Policy [DTSC, 1995a]:

- Site background, including a summary of Site history, Site use, previous investigations, and previous removal actions;
- Summary of Site risks, including an overview of the extent of Site contamination and chemicals of concern (COCs), the risks to human health and/or the environment, and the determination of cleanup levels (CULs);
- Summary and evaluation of remedial technologies considered, the development of remedial action alternatives, a summary of the alternatives evaluated, a description of the preferred remedy, and the basis for the remedy selection; and
- Summary of public relations activities, including a solicitation for public review and comments on the preferred remedies.

This FS/RAP documenting the selection of the remedy was prepared following public review and comment from 28 October to 18 December 2020.

1.2 FS/RAP Organization

This FS/RAP was prepared in accordance with DTSC Guidance Document No. EO-95-007-PP, Remedial Action Plan (RAP) Policy [DTSC, 1995a] and is generally consistent with the United States Environmental Protection Agency's (USEPA's) Guidance for Conducting Remedial Investigations and Feasibility Studies Under Comprehensive Environmental Response,

Compensation, and Liability Act (CERCLA) [1989c] and Guide to Preparing Superfund Proposed Plans, Records of Decision, and Other Remedy Selection Decision Documents [1999]. This report is organized as follows:

- Section 1, Introduction: Discusses the purpose of the document, presents the report organization, outlines the regulatory framework under which this work is being performed, and presents the project schedule;
- Section 2, Site Background: Summarizes and discusses the history of the Site, outlines UPC's redevelopment plans, summarizes the previous investigations and remedial activities, describes regional and Site geology and hydrogeology, and summarizes the results of the OU-2 Data Gap Investigation;
- Section 3, Nature and Extent of Contamination: Summarizes the nature and extent of contamination in soil and groundwater at OU-2 and the Site contaminants retained as chemicals of potential concern (COPCs);
- Section 4, Site-Specific Health Risk Assessment: Includes a Site-specific health risk assessment and summarizes the CULs based on the assessment of Site-specific health risks;
- Section 5, Remedial Action Objectives: Presents potential Applicable or Relevant and Appropriate Requirements (ARARs) for implementation of remedial actions at the Site and RAOs developed for cleanup of the Site;
- Section 6, Feasibility Study and Alternatives Analysis: Describes the screening of the general response actions and corresponding remedial technologies and presents an evaluation and comparison of remedial alternatives;
- Section 7, Preferred Remedial Approach: Summarizes the preferred remedial approach; discusses the excavation and in situ remedial activities; outlines the sampling methodology to confirm cleanup levels have been met following soil and groundwater remedial actions; and outlines post-remediation operation and maintenance (O&M) plans and land use restrictions that will be implemented;
- Section 8, Schedule: Presents the schedule for approval of the FS/RAP, completion of the Remedial Design and Implementation Plan (RDIP), and completion of the remedial actions at the Site;
- Section 9, References: Presents references to documents cited in this FS/RAP;
- **Appendix A** includes information on the Industrial Way properties;
- **Appendix B** includes data from historical site investigations;
- **Appendix C** includes the OU-2 Data Gap Investigation Report [Geosyntec, 2019a];
- **Appendix D** includes an OU-2 Baseline Health Risk Assessment (HRA) report;
- **Appendix E** includes Estimated Cost Summary Tables for Remedial Alternatives, which provides cost estimates for implementation of the remedial action alternatives evaluated for the Site;

- **Appendix F** includes import fill criteria for the Site; and
- **Appendix G** includes the administrative record for the Site.
- **Appendix H** will include a Responsiveness Summary consisting of responses to public comments received on the FS/RAP; and
- **Appendix I** will include a Statement of Reasons and Preliminary Non-Binding Allocations of Responsibility.

1.3 Regulatory Framework

1.3.1 Summary of Orders and NCP Framework

This FS/RAP was prepared to address the requirements of I&SE Order and Remedial Action Order I&SE 89/90-004, which was issued by DTSC in 1990 and formally transferred to the RWQCB in 1995 [DTSC, 1990; 1995b]. DTSC concurrently rescinded the requirements of I&SE 89/90-004 for OU-2 [DTSC, 1995b]. The RWQCB has not issued an order for OU-2 to replace DTSC's I&SE 89/90-004.

This FS/RAP has been prepared pursuant to California HSC Section 25356.1 in accordance with the DTSC Guidance Document No. EO-95-007-PP, Remedial Action Plan Policy [DTSC, 1995a]. The preferred remedial actions meet the requirements specified in the California HSC Chapters 6.5 and 6.8. As provided under Chapter 6.8, the FS/RAP is also consistent with the applicable Federal requirements for the evaluation and selection of a final remedial action as outlined in the USEPA's National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 Code of Federal Regulations (CFR), Part 300.400 [USEPA, 1990]. Although the Site is not listed on the USEPA's CERCLA National Priorities List (NPL), as provided under Chapter 6.8, it is being cleaned up consistent with the NCP, which requires that remedial actions achieve a level of cleanup that is protective of human health and the environment (42.U.S.C. §§9601 et. seq.).

Historical Site documents have been completed that satisfy the NCP framework, including the following:

- Remedial Investigation Data Study Report, which summarized historical Site characterization data [Hydrologic Consultants, Inc. (HCI), 1989];
- Supplemental Remedial Investigation Report, which further characterized the nature and extent of chemicals at the railyard, identified possible source locations, identified potential migration pathways, evaluated potential risks, and collected information necessary for completion of a Feasibility Study and Remedial Action Plan [Levine-Fricke, 1990];
- Feasibility Study Report, which summarized Site characterization data and developed and evaluated possible remedial alternatives for the Site [Levine-Fricke, 1991]; and
- Revised Remedial Action Plan, which presented the results of a Site chemical mobility analysis and described the preferred remedial alternative [Burns and McDonnell Waste Consultants, Inc. (B&M), 2002a]; the Revised Remedial Action Plan was conditionally approved by the RWQCB [2002].

1.3.2 Historical NPL Evaluation (200 Industrial Way)

The former hide and glue plant located at 200 Industrial Way from approximately 1878 to 1962 was evaluated in 1987 by the USEPA. Based on this evaluation, USEPA concluded that the property did not meet the criteria for inclusion on the CERCLA NPL [Ecology & Environment, 1987]. According to the evaluation, there were no documented releases, the quantities of waste generated and discharged were unknown, and there was not a target population that would have been affected by historical releases at the Site. To date, none of the Industrial Way properties have been included on the CERCLA NPL.

1.4 Anticipated Brisbane Baylands Development

The Site is intended to be a portion of a larger mixed-use development project that, following remediation and mitigation described herein in accordance with the above referenced 1990 I&SE Order, will include housing, commercial businesses, civic uses, and public open space. UPC will be the Master Developer of the development. For the purposes of anticipating future uses only, the development would include the following activities:

- Demolition of existing structures excluding historical structures, which would be preserved as part of the redevelopment;
- Decommissioning existing groundwater monitoring wells;
- Scarifying the ground surface to remove all vegetation;
- Import and placement of clean soil fill to alter the ground elevation over a majority of the Site land surface;
- Surface grading to level the ground surface;
- Installation of new utilities; construction of a new network of roads, including the Geneva Avenue extension at the northern Boundary of the Site;
- Construction of a Peninsula Corridor Joint Powers Board (Caltrain) right-of-way flyover for Geneva Avenue;
- Construction of buildings for residential, commercial, and civics uses; and
- Construction of public parks, open space, and greenbelts.

1.5 Development Project Schedule

The goal for the master developer is to initiate vertical development activities by March 2023. The development will proceed in phases that will be completed over a time period of 10 years or more. Some components of Site remediation, as presented in this FS/RAP (e.g., building demolition, vegetation removal, rough grading, clean soil import, and placement), while potentially occurring in phases, may also take place during the initial rough grading such that a majority of the Site will have a clean soil cover over it prior to the commencement of major vertical development construction activities. A specific implementation schedule will be included in one or more RDIPs, which will be developed following approval of this FS/RAP.

2. SITE BACKGROUND

2.1 Site Description

The 1990 I&SE Order was issued by DTSC for the entire Brisbane Railyard property, and in 1995, an amendment to the order divided the Brisbane Railyard into the then OU-1 (portion north of Geneva Avenue) and OU-2 (portion south of Geneva Avenue). OU-2 is approximately 130 acres [UPC, 2011b] and is comprised of the southern portion of the former Southern Pacific Transportation Company (SPTC) Brisbane Railyard and properties fronted on Industrial Way. The Site is bounded to the north by the San Mateo County portion of the Universal Paragon Corporation Operable Unit (UPC OU-SM), which was a portion of the former OU-1; to the west by Bayshore Boulevard; to the southwest by Industrial Way; to the east by the Caltrain railroad tracks; and to the south by Ice House Hill (**Figures 1** and **2**). The former railyard portion of the Site is currently owned by Sunquest Properties, Inc.

The Site, in addition to OU-2, also includes properties fronted on Industrial Way. The Industrial Way properties are located to the southwest of the former railyard and are bound by the railyard to the north and east, by Bayshore Boulevard to the west, and by Ice House Hill to the south. The Industrial Way properties include sites identified on GeoTracker as Kessler and Kessler #1 (250 Industrial Way) and Kessler and Kessler #2 (350 Industrial Way). This portion of the Site is currently owned by Brisbane Bayshore Properties.

Aerial photographs of the Site taken between 1935 and 1991 are provided in **Appendix A**.

2.2 Historical Use Summary

2.2.1 Former Railyard

SPTC acquired the Brisbane Railyard property in 1896 [Levine-Fricke, 1990] and conducted operations on OU-2 from approximately 1907 until 1982, during which time railroad facilities, oil storage tanks, and an area designated as a disposal site were constructed [Lipps, 2013]. The major railyard facilities located within OU-2 consisted of the following (**Figure 2**):

- Machine and Erecting Shop – constructed in 1920, this facility was a machine shop and mechanical construction shop;[1]
- Turntable – constructed in 1908 and retired in 1942, the turntable was used to transfer locomotives to the individual servicing stalls within the roundhouse;
- Roundhouse – constructed in 1908 and now a vacant structure, this was a service area for the locomotives;
- Oil Tank – constructed in 1920, this three-million-gallon above-ground tank stored fuel oil, commonly called Bunker C, for boilers used in the steam locomotives. The tank was dismantled in 1988 and 550,000 gallons of residual oil were recovered and removed for disposal;

[1] Also identified as the "Machine and Electric Shop" in historical figures and demolished after 1969 but before 1993.

- Tank and Boiler Shop – constructed in 1922 and retired in 1963, this shop repaired water tanks and boilers for steam locomotives. The building is still standing and is currently used by Lazzari Fuel Company, a manufacturer of charcoal briquettes;
- Switching Yard – constructed in the early 1900s, the yard consisted of a series of tracks used for organizing and building freight trains. It was the largest part of the yard. Caltrain operates a commuter line including four active tracks with two siding tracks along the eastern edge of the Site; and
- South Disposal Area – a solid waste dump site containing waste imported to and generated at the railyard, and a railcar cleaning area [Levine-Fricke, 1991].

After SPTC's major railyard operation ceased in 1982, the railyard was abandoned and most of the original structures were demolished [B&M, 2002a]. Various foundations and building slab outlines are still present.

Chemicals that may have been used or generated as waste at these facilities include metals, volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), polychlorinated biphenyls (PCBs), and petroleum hydrocarbons, including gasoline-range hydrocarbons (TPH-g), diesel-range hydrocarbons (TPH-d), and polynuclear aromatic hydrocarbons (PAHs). Organochlorine pesticides (OCPs) may have also been used. In contrast, radionuclides are not suspected of being present in Site soil at concentrations exceeding regional background based on the Site history detailed above.[2] Although soil samples have not been previously tested for radionuclides, this is not considered a data gap because radionuclides are not associated with any known Site use and the Site ceased receiving fill material by 1935, whereas the widespread use of radionuclides began with nuclear weapons testing in 1945.

In 1985, the California Department of Health Services, Toxic Substances Control Division, determined that "*There has been a release of hazardous substances on, or into the land on the Southern Pacific Bayshore Yard site located east of the intersection of Bayshore Boulevard and Geneva Road, Brisbane.*" Therefore, DTSC issued an "Order to Post and Fence", which required SPTC "*… to post the site with signs and enclose portions of the site with fences…*" [DTSC, 1985].

2.2.2 Industrial Way Properties

The Industrial Way properties, which are located outside of the former railyard, include three former underground storage tank (UST) sites located at 250, 285, and 350 Industrial Way, in addition to other properties as discussed below that are not known to be impacted. The USTs located at 250, 285, and 350 Industrial Way were thought to have once been used in support of the

[2] Natural and anthropogenic sources may contribute to regional background radioactivity in soil; natural sources include primordial radionuclides originally present in bedrock, atmospheric deposition of cosmogenic radionuclides, and primordial radionuclides present in seawater which may accumulate in soils and sediments along ocean margins. Large-scale anthropogenic activities also contribute to regional background radioactivity in soil, including atmospheric deposition of radionuclides released during nuclear weapons testing (i.e., nuclear fallout) and nuclear disasters (e.g., Fukushima Daiichi) which can be transported large distances by atmospheric and oceanographic processes.

former railyard operations and were adjacent to buildings historically related to railyard activities [Weiss Associates, Inc. (Weiss), 2008].

Historical activity at Industrial Way also included the manufacture of glue and fertilizer by Consolidated Chemical/Stauffer Chemical and previous tenants between approximately 1878 and 1963 [Ecology & Environment, Inc., 1987; Treadwell & Rollo (T&R), 1993]. Historical industrial operations prior to 1990 were reportedly conducted at the following approximate locations [Levine-Fricke, 1990]:

- 21 to 27 Industrial Way – automobile refinishing;
- 55 and 55A Industrial Way – Moore Manufacturing Company;
- 60 to 130 Industrial Way – fertilizer plant;
- 250 Industrial Way – glue works;
- 285 Industrial Way – hide and glue plant;
- 290 to 295 Industrial Way – Consolidated Chemical Industries; and
- 300 to 312 Industrial Way – bone storage.

A summary of historical uses of Industrial Way properties from 1977 through 1993 is provided in **Appendix A** [T&R, 1993]. Briefly, the properties at 21 through 27 and 55 through 400 Industrial Way comprise the Industrial Way properties included in the Brisbane Baylands development; the properties at 10, 36, and 40 Industrial Way are excluded (refer to Figure 2 of **Appendix A**). The tenant site history is provided in Table 2 of **Appendix A**. The longest-tenured operation appears to be a hide and glue plant, which occupied the northern portion of the Industrial Way properties between approximately 1878 and 1962 and was owned successively by Pacific Bone, Coal, and Fertilizing Company; Consolidated Chemical Industries, Inc.; and Stauffer Chemical Company.

Historical chemical use at the Industrial Way Properties from 1977 through 1993 is provided in Table 7 of **Appendix A.** In addition to chemicals potentially used in the railyard, historical activities at Industrial Way properties may have included the use of the following hazardous materials:

- Acids and bases;
- Gasoline and oils used in vehicle maintenance;
- Santobrite™, a product containing pentachlorophenol used as a preservative for wood and glue products [T&R, 1993]; and
- Solvents used in printing, painting, dyeing textiles, and cleaning.

T&R noted that chemicals in use at the time of Site inspection in 1993 involved small quantities that appeared to be properly used, stored, and disposed or recycled [T&R, 1993].

The former rail yard buildings have since been replaced by more modern buildings. Land uses at these properties currently include automobile garages, storage warehouses, and a boxing ring. Aside from the UST cases at 250, 285, and 350 Industrial Way, no chemical releases to the

environment requiring regulatory response are documented in the RWQCB's and DTSC's electronic document repositories GeoTracker and EnviroStor, respectively.

2.3 Site Characteristics

2.3.1 Topographic Conditions

The Site lies at the base of the Visitacion Valley between Candlestick Point to the north and Visitacion Point to the south. The Site is situated on a low-lying flatland that was formed by filling a former embayment located along the western margin of San Francisco Bay. The current land surface has been largely formed by filling of the area in the early 1900s. The Site is relatively flat, excluding drainage ditches and delineated wetlands, and ground surface elevations range from approximately 7 to 10 feet above mean sea level (msl) relative to the National Geodetic Vertical Datum of 1929 (NGVD29). A steep incline known as Ice House Hill is in the southwest corner of the Site adjacent to Bayshore Boulevard (**Figure 2**).

2.3.2 Surface Water Hydrology

Surface water at the Site and vicinity primarily moves as overland flow that drains into catch basins and drop inlets to the local storm sewer system that drains to San Francisco Bay. A drainage ditch, which is also referred to as Visitacion Creek, is located east of the Site within the Brisbane Landfill, and the Brisbane Lagoon is south of the Site. Jurisdictional freshwater marsh wetlands occupying approximately 1.4 acres are located in the central portion of the Site (**Figure 2**) [B&M, 2004]. The area is characterized by depressions and man-made drainages which conveyed stormwater out of the railyard. The drainage swale, north ditch, and middle ditch are lined with polyethylene and the adjacent area is dominated by non-native, emergent wetland flora [B&M, 2004; 2019].

The eastern edge of the Site is located approximately 2,000 feet west of the San Francisco Bay shoreline. In March 2018, the County of San Mateo issued its Sea Level Rise Vulnerability Assessment [County of San Mateo, 2018]. The assessment did not identify the Site as being vulnerable to inundation from sea level rise based on then current projections. Also in March 2018, the California Ocean Protection Council Science Advisory Team (OPC-SAT) issued The State of California Sea Level Rise Guidance report that provided an update to the sea level rise projections, based on current and best available science at that time [California Natural Resources Agency, 2018]. Based on the OPC-SAT analysis and recommendations, sea level rise elevations for a high emissions scenario are projected to rise 1.9 feet by the year 2050 and 6.9 feet by the year 2100. Based on the conclusions of the County of San Mateo assessment and given that the Site is 2,000 feet inland and is separated from the San Francisco Bay by Highway 101, the Brisbane Landfill, and the Caltrain railroad right of way, impacts to the Site from sea level rise are expected to be minimal, if any. A comprehensive final analysis will be prepared as part of the RDIP. The RDIP will include an updated sea level rise vulnerability assessment and adaptive management plan to address any impacts that may be identified. The Sea Level Rise Vulnerability Assessment report for the Site will be consistent with State of California Sea-Level Rise Guidance, San Francisco's Bay Conservation and Development Commission's Bay Plan, and the RWQCB guidance. Several engineering measures are available to mitigate any potential impacts, including raising the development grade, constructing protective berms, constructing seawalls, and constructing living

shorelines, among others, and will be incorporated into the adaptive management plan as appropriate.

2.3.3 Local Geology

Site stratigraphy has been extensively investigated and characterized as part of the Schlage OU site investigation. The Site is underlain by Quaternary-age alluvial deposits, dune sediments, estuarine sediments, and anthropogenic fill [MACTEC Engineering and Consulting, Inc. (MACTEC), 2009; B&M and T&R, 2002]. The Site is underlain by five distinct geological units that are summarized in the updated Hydrogeologic Framework prepared by MACTEC for the Schlage OU [MACTEC, 2010] as follows:

- **Fill**: a heterogeneous mixture of clay, silt, sand, gravel, and building debris that is exposed at ground surface and extends for a thickness of 10 to 15 feet below ground surface ("Fill" zone). At the time SPTC acquired the property in 1896, the northern half of the railyard consisted of fill from undocumented sources that had been placed into the tidal flats of San Francisco Bay. Between 1896 and 1935, fill was placed on most of the remaining area between Bayshore Boulevard and Tunnel Avenue. In 1935, fill activity apparently ceased, and the Site achieved its current topography. Sources of the fill reportedly include pulverized Franciscan bedrock derived from the surrounding hills, rubble from the 1906 San Francisco earthquake, and soil, debris, and rubble from other possible undocumented sources [DTSC, 1993].
- **Young Bay Margin Deposits (YBMD):** High-plasticity and low-permeability clay known as Young Bay Mud (YBM), and some interbedded silty sand layers and organic material that underlies the Fill and extends for a thickness of 5 to 20 feet below the Fill.
- **Colma Formation:** The upper portion of the formation consists of yellow to brown, fine- to medium-grained sand with some silt and clay which underlies the YBMD and extends for a thickness of approximately 30 feet. The lower portion of the formation consists of an approximately 10 to 20 feet thick layer of Old Bay Margin Deposits (OBMD), including yellow to brown, stiff, low-plasticity clay known as Old Bay Mud (OBM) that is considered to be an aquitard that separates the Colma Formation from the underlying Merced Formation. The Old Bay Margin Deposit Sand Unit (OBMD-SU) is a sand layer located within the OBM aquitard and has been documented as a laterally discontinuous layer beneath the Schlage OU north of the Site. It is uncertain whether the OBMD-SU extends beneath the Site.
- **Merced Formation:** Weakly consolidated sandstone with secondary siltstone and claystone. The thickness of the Merced Formation is unknown beneath the Site but reportedly extends to the Franciscan Bedrock [MACTEC, 2010].
- **Franciscan Assemblage bedrock**: Occurs at a depth of 50 to 60 feet below ground surface (bgs) beneath the Schlage OU site [MACTEC, 2010]. The Franciscan bedrock consists of partially metamorphosed, weathered, and sheared greenstone, interbedded chert and shale, and interbedded sandstone and shale. Prior to infilling beginning in the early 1900s, the Site was part of San Francisco Bay. Quaternary sediments, derived from erosion of the valley headlands, were deposited on slopes, in ravines, and in the

topographic lows of Visitacion Valley. Franciscan Assemblage bedrock is exposed in ridges to the south, west, and north of the Site. The Franciscan bedrock consists of partially metamorphosed, weathered, and sheared greenstone, interbedded chert and shale, and interbedded sandstone and shale. These sediments have formed interlayered beds generally composed of poorly to moderately sorted unconsolidated carbonaceous silt and clay. Near the bay, the carbonaceous silt and clay are overlain by the YBM Formation [B&M, 2002a].

A geologic cross-section prepared for the Schlage OU is provided in Appendix A of the Data Gap Investigation Report (**Appendix C**) [MACTEC, 2010]. Cross-sections of the sediments beneath the Site are illustrated in **Figures 3a** and **3b**.

2.4 Site Hydrogeology

The water-bearing zones at the Site are the Fill, the Colma Formation, and the Merced Formation. The YBM constitutes an aquitard that separates the Fill from the Colma Formation and confines the underlying Colma Formation. A deeper aquitard separates the Colma Formation from the Merced Formation and confines the underlying Merced Formation.

The Site groundwater monitoring network consists of 44 wells and piezometers screened in the three water-bearing zones (**Figure 2**). Construction details for the wells are summarized in **Table 1**. The depth to first encountered groundwater (Fill water-bearing zone) at the Site was approximately 4 to 10 feet bgs in August 2018 [B&M, 2019].

Historically, wells that penetrate the Colma Formation exhibit artesian conditions. This unit is recharged by groundwater flow from below and from Visitacion Valley sediments to the north and west. Groundwater potentiometric elevations increase with depth, and differences in hydraulic head between water-bearing zones of approximately 5 feet between the Fill and the Colma Formation have been observed. The differences in hydraulic pressure (head) result in strong upward vertical gradients between each water-bearing zone.

Figure 4 illustrates the potentiometric surface in the Fill water-bearing zone based on the most recent semi-annual groundwater monitoring report [B&M, 2019]. In the Fill, the lateral hydraulic gradient is generally flat with a historical magnitude of approximately 0.0005 feet per foot (ft/ft). The horizontal groundwater flow in the Fill is generally toward the east with localized gradients toward the center of the Site, caused by higher topography and groundwater elevations to the north, south, east, and west. Monitoring wells completed in the Colma and Merced Formations at the Site are not monitored routinely, but at the adjacent UPC OU-SM, hydraulic gradients in the Colma Formation are approximately 0.01 ft/ft toward the northwest. The direction of the lateral hydraulic gradient in the Merced Formation is predominantly to the southeast with historical magnitudes that range from 0.007 ft/ft to 0.025 ft/ft.

2.5 Groundwater Use

Groundwater at the Site is not used for domestic or industrial purposes. The City of Brisbane provides the Site and surrounding residences and businesses with public water. Water service originates from the Hetch Hetchy Reservoir in the Sierra Nevada Mountains.

Total dissolved solids (TDS) concentrations, and corresponding electrical conductivity, in the Fill groundwater are elevated because this groundwater zone was originally saturated with the saline waters of San Francisco Bay. The Fill water-bearing zone is primarily recharged by local surface water infiltration. Evapotranspiration appears to be a dominant process that imposes an inward gradient toward vegetated areas where evapotranspiration is greatest, particularly in the dry season. For these reasons, the RWQCB concluded that the Fill zone groundwater at UPC OU-SM meets exceptions to State Water Resources Control Board Resolution No. 88-63 and is not likely to be used as a potential drinking water source [RWQCB, 2019b].

Wells screened in the deeper water-bearing units (i.e., Colma and Merced Formations) do not exhibit high electrical conductivity values. These water-bearing units are recharged from offsite sources to the north and west and are under hydrostatic pressure. Based on the notable differences in groundwater quality and hydrostatic pressure differentials, it appears that the YBM layer acts as a competent aquitard that separates the Fill water-bearing zone from the underlying Colma formation.

2.6 Former Railyard Investigation History

Numerous remedial investigations have been conducted to date at the Site and at the neighboring UPC OU-SM and the San Francisco County portion of Universal Paragon Corporation Operable Unit (UPC OU-SF), previously referred to collectively as the Brisbane Railyard. Many of those investigations involved characterizing the distribution in groundwater of chlorinated VOCs from the Schlage OU. Investigations of the distribution of contaminants at the former Brisbane Railyard, including OU-2, are listed below, and available data from historical investigations are provided in **Appendix B**. Investigation results prior to 1989 were summarized in the Remedial Investigation and Data Study [HCI, 1989].

2.6.1 Environmental Assessment of Fill – 1982

In 1982, Harding Lawson Associates (HLA) conducted an environmental assessment of the Brisbane Railyard, which consisted of drilling and collecting soil samples from 25 shallow boreholes and installing monitoring wells in 24 of the boreholes.[3] The objective of this assessment was to assess the presence of contaminants in the former railyard [B&M, 2002a]. Groundwater samples were collected from these wells and one deep production well. Ten soil samples, 24 groundwater samples, and one oil sample from the vicinity of the oil tank were collected and submitted for chemical analysis [Levine-Fricke, 1990].

2.6.2 Soil and Groundwater Investigation – 1985

In 1984, Ecology & Environment, Inc. conducted a two-phase environmental investigation at the Brisbane Railyard. The first phase of the investigation included measuring water levels in 24 of the HLA wells and collecting groundwater samples from 18 of the wells. The second phase of the investigation, undertaken in 1985, included abandoning and sealing all the HLA wells due to problems with their construction, drilling and collecting soil samples from 41 soil borings, and installing and collecting soil and groundwater samples from 14 new A-Zone wells and 13 new B-

[3] The investigation was conducted in both the northern and southern portions of the former Brisbane Railyard.

Zone wells.[4] A total of 136 soil samples and 46 groundwater samples were collected and analyzed. The results of soil samples were not discussed in the recent reports. Groundwater levels were measured and the flow direction was evaluated [Levine-Fricke, 1990]. Groundwater samples were analyzed for VOCs and metals. Samples from monitoring well MW-4A had detections of metals including arsenic, barium, chromium, copper, lead, and zinc. The maximum concentrations were 1.90 milligrams per liter (mg/L) for arsenic, 2.93 mg/L for barium, 2.84 mg/L for lead, 1.56 mg/L for copper, 1.81 mg/L for chromium, and 4.88 mg/L for zinc.

2.6.3 Remedial Action Alternative Feasibility Study: Field Investigations – 1986

In 1985 and 1986, the Mark Group performed a Remedial Action Alternative Feasibility Study for the Brisbane Railyard, which included drilling and collecting soil samples from 21 soil borings, nine A-Zone wells, and five B-Zone wells. Four of the A-Zone wells were installed next to existing Ecology & Environment, Inc. wells screened in the B-Zone. Five A-Zone and B-Zone well pairs were installed in new locations. A total of 69 soil samples were collected from soil borings and well borings, and 41 groundwater samples were collected and analyzed. The Mark Group also surveyed measuring points and measured water levels in all the wells, performed some small-scale aquifer tests to estimate hydraulic conductivities and aquifer interconnections, and made limited measurements of tidal fluxes [Levine-Fricke, 1990]. Groundwater samples were analyzed for metals and VOCs.

2.6.4 Groundwater Monitoring Program – 1989

In 1989, S.S. Papadopoulos & Associates, Inc. developed and implemented a semi-annual groundwater monitoring program for the Brisbane Railyard. Under the monitoring plan, S.S. Papadopoulos & Associates, Inc. sampled groundwater and measured water levels in 40 wells [Levine-Fricke, 1990]. The groundwater samples were analyzed for VOCs; benzene, toluene, ethylbenzene, and xylenes (collectively, BTEX); and metals.

2.6.5 Groundwater Monitoring – 1989

HCI conducted a second groundwater sampling event in June 1989. Water levels were measured, and samples were collected from 31 wells. HCI also removed 11,500 gallons of oil-contaminated water and sediments from the drainage ditch for offsite treatment and recycling [Levine-Fricke, 1990].

2.6.6 Remedial Investigation Data Study – 1989

In May 1989, HCI [1989] completed a Remedial Investigation Data Study (RIDS) report for the Brisbane Railyard (referred to in their report as “SPTCO Bayshore Facility”). The purpose of the RIDS was to (1) review and interpret data generated in the previous investigations; (2) identify data gaps and additional work needed to allow better definition of the nature and extent of contamination and the potential risks associated with the Site; and (3) design effective remedial

[4] The designations “A-“ and “B-zone” wells, used in historical Site documents, correspond to the Fill zone and Colma formation, respectively.

actions. To meet these objectives, HCI developed a Supplemental Remedial Investigation (SRI) Work Plan [Levine-Fricke, 1990]. In summary, HCI [1989] concluded the following:

- Low to moderate concentrations of metals were found in soils at many locations across the Site; maximum concentrations were as follows:
  - Arsenic − 120 milligrams per kilogram (mg/kg);
  - Barium − 600 mg/kg;
  - Chromium − 120 mg/kg;
  - Copper − 5,700 mg/kg;
  - Lead − 16,000 mg/kg; and
  - Zinc − 3,400 mg/kg.
- Oil and/or fuel type organic materials have been observed in the soils underlying the Turntable and former Oil Tank areas by all the previous investigators; and
- The presence of VOCs in soils appears to be limited to low levels of chlorinated hydrocarbons in the northwest corner of the railyard (i.e., UPC OU-SM), where they are closely related to the extent of the Schlage OU VOC plume.

2.6.7 Supplemental Remedial Investigation – 1990

In 1990, Levine-Fricke [1990] implemented the SRI Work Plan for the Brisbane Railyard prepared by HCI in 1989. The field work and laboratory analyses included a soil-gas/groundwater survey, soil characterization from shallow trenches and deeper borings, surface soil sampling, air sampling, piezometer and monitoring well installation, groundwater and surface-water sampling, hydraulic testing, and tidal fluctuation monitoring. The majority of work was performed in the OU-2 area. Forty shallow borings were drilled to collect samples and make visual observations to identify the lateral and vertical extent of chemical-affected soils at the site. The analytical results and visual observations of the soil samples collected from the borings were also used to refine the locations for the eight new wells and 10 piezometers identified in the SRI Work Plan [HCI, 1989]. Additionally, eight groundwater monitoring wells were installed in the B-Zone to better characterize quality and flow of the deeper water bearing unit. Data collected through these activities, along with soil and groundwater data previously collected, were summarized and evaluated to characterize the extent of chemicals at and in the vicinity of the Brisbane Railyard.

The SRI [Levine-Fricke, 1990] identified two general areas of concern at OU-2:

- The Turntable and Oil Tank Areas – Petroleum hydrocarbons, primarily heavy, viscous Bunker C oil, were observed in the soil throughout this area. Other lighter-fraction oils were also identified in the TT Area. Bunker C oil extends offsite to properties along Industrial Way.
- The South Disposal Area – Metals were detected in soil at concentrations above regulatory standards in this area. The principal metals of concern in this area are arsenic, copper, mercury, and lead, though other metals have also been detected. The maximum concentrations were as follows:

- Arsenic – 18 mg/kg;
- Copper – 3,500 mg/kg;
- Mercury – 7.4 mg/kg; and
- Lead – 6,700 mg/kg.

2.6.8 Additional Site Characterization – 1997

The 1997 investigation at the Brisbane Railyard was designed to collect data regarding soil and groundwater quality that could be used to establish risk-based cleanup goals [B&M, 1997]. Fifty-seven borings were installed at the Brisbane Railyard and soil and groundwater samples were collected for analytical testing between August and October 1997. Soil samples were analyzed for the presence of TPH (diesel and Bunker C ranges), SVOCs, and metals. The testing program results indicated that TPH was the primary COPC in soil in the Turntable/Oil Tank Area and the former UST Area just west of the railroad tracks (Figure 2). The maximum concentrations of TPH-d and Bunker C in the Oil Tank/Turntable Area were 41,000 mg/kg and 120,000 mg/kg, respectively. In the former UST area, the maximum concentrations of TPH-d and Bunker C were 1,500 mg/kg and 2,600 mg/kg, respectively. In the South Disposal Area, TPH-d was found at concentrations up to 6,100 mg/kg and Bunker C at concentrations up to 24,000 mg/kg. Additionally, a number of SVOCs were detected in the Turntable/Oil Tank and former UST areas, including pyrene (13,000 micrograms per kilogram [µg/kg]) and fluoranthene (11,000 µg/kg). In the South Disposal Area, metals were identified as COPCs. In particular, copper and lead were found at maximum concentrations of 18,000 mg/kg and 13,000 mg/kg, respectively.

Based on 19 groundwater samples obtained from the Oil Tank/Turntable area wells, TPH-d and Bunker C were present at concentrations up to 2,700 mg/L and 11,000 mg/L, respectively. TPH-d and Bunker C were also found in the former UST area at maximum concentrations of 4.3 mg/L and 12 mg/L, respectively. One groundwater sample collected from the South Disposal Area indicated the presence of TPH-d at 10 mg/L and Bunker C at 43 mg/L. No SVOCs were found in the UST area groundwater sample. SVOCs were also detected in the Turntable/Oil Tank Area at a maximum concentration of 590 micrograms per liter (µg/L) (phenanthrene). In general, copper and lead concentrations were elevated relative to other metals detected in groundwater samples. Total copper and lead concentrations ranged from 18 µg/L to 4,500 µg/L, and 110 µg/L to 12,000 µg/L, respectively [B&M, 1997].

2.6.9 Groundwater Plume Stability Evaluation – 1998

The main objective of this work was to evaluate the groundwater plume stability [B&M; 1998a, 1998b]. In addition to analytical evaluation, historical trends in annual precipitation amounts and laboratory analytical methods were evaluated for the potential to affect plume stability. B&M [1998b] concluded that Bunker C concentrations were generally steady or decreasing over time. Further, the groundwater plume evaluation indicated that the plume was relatively stable and contaminant distribution patterns remained relatively consistent since 1995.

2.6.10 Remedial Action Plan – 1999

Additional soil characterization was conducted in June 1999 [B&M, 1999]. This additional characterization consisted of 20 soil borings located north of the Turntable Area and scattered at roughly equal spacing across the eastern half of OU-2. In general, soil borings were advanced to 6 to 9 feet bgs or several feet below groundwater level, whichever was first encountered. The report concluded that:

- The Roundhouse/Turntable/Oil Tank Area was primarily contaminated with Bunker C oil;
- The Bunker C oil was adsorbed to soil and dissolved in groundwater, and throughout much of the area, present as free product;
- The free-phase Bunker C oil extended a short distance north of the Roundhouse, southwest of the former Turntable area, and in an elongated area underneath and to the south of the former Oil Tank;
- The Bunker C oil was generally present from several feet below the surface, through the Fill to the top of the YBM;
- In some areas, such as in the vicinity of the former Oil Tank, Bunker C oil was also present at or near the ground surface;
- With the exception of benzo(a)pyrene, all analytical results for SVOCs did not exceed proposed cleanup criteria; and
- Elevated concentrations of metals (including arsenic, barium, chromium, copper, lead, and zinc) were also detected in soil and groundwater in these areas, but not at concentrations exceeding proposed cleanup criteria.

Soil in the vicinity of the South Disposal Area contained metals, primarily lead, at concentrations exceeding proposed cleanup criteria. Metals concentrations in soil are generally highest at or near the surface and decrease with depth. The maximum concentration of arsenic was 99 mg/kg, barium was 1,100 mg/kg, copper was 580 mg/kg, lead was 7,600 mg/kg, and zinc was 2,100 mg/kg. Groundwater in this vicinity also contained lead. The drainage ditch transecting both the Oil Tank/Turntable area and the South Disposal Area was also evaluated. Surface water in the northern and middle sections of the ditch had a petroleum sheen or free product present, while surface water in the southern section of the ditch had low concentrations of dissolved Bunker C oil. The ditch also received storm-water runoff, which may have mobilized both dissolved and soil-sorbed contaminants. Low levels (i.e., below 50 µg/kg) of PCBs were detected in three of the eight soil samples collected with a maximum concentration of 28 µg/kg. However, since the detected concentrations were below the residential preliminary remediation goals at that time, they were not considered COPCs.

The 1999 RAP was not approved by the RWQCB and was followed by the Revised RAP described in Section 2.6.12 below.

2.6.11 Supplemental Bunker C Delineation – 2001

As proposed in an Addendum to the 1999 RAP [B&M, 2000], a soil investigation was performed in May-June 2000 [B&M, 2001] to further delineate the nature and extent of petroleum hydrocarbon impacts in the Southern Area of the Brisbane Railyard. The work included drilling 110 soil borings and collecting and analyzing soil samples for petroleum products (i.e., TPH-d, Bunker C oil, motor oil, gasoline, and Stoddard solvent), VOCs, SVOCs, select metals, herbicides, pesticides, and PCBs. The report concluded that the primary COPC in the OU-2 area is Bunker C oil. The report estimated that the total area of impact above 46,000 mg/kg was approximately 6.5 acres, while the area of impact between 20,000 mg/kg and 46,000 mg/kg was approximately 3.1 acres.

Two metals, arsenic and lead, were detected above their respective commercial maintenance worker cleanup criteria of 19 mg/kg and 2,464 mg/kg. The maximum concentration of lead was 13,000 mg/kg. Further, a limited area of CVOC[5] impacts was discovered in the Oil Tank Area with maximum trichloroethene (TCE) and tetrachloroethene (PCE) concentrations of 170 mg/kg and 2,500 mg/kg, respectively. The report also concluded that SVOCs were not COPCs. No PCBs, pesticides, or herbicides were detected in any of the tested samples; therefore, they were not considered COPCs at the time [B&M, 2001].

2.6.12 Revised RAP – 2002

The OU-2 Revised RAP [B&M, 2002a] proposed to cap all soils at the Site rather than attempt to excavate soil with Bunker C concentrations exceeding 46,000 mg/kg, due to testing indicating that: (1) historical Bunker C impacts to soil were more widespread than previously thought; and (2) the mobility in soil of weathered Bunker C is low. The Revised RAP also proposed specific plans to close the drainage ditch and to excavate the small CVOC-impacted area near the former Oil Tank. The RWQCB conditionally approved the Revised RAP, concurring with the results of analysis demonstrating that weathered Bunker C oil is immobile because it is too viscous to flow and exists as a semi-solid at typical Site temperatures [RWQCB, 2002]. The RWQCB further concluded "*Bunker C oil free product does not impose unacceptable risk to human health and the environment when proper risk management procedures are followed*."

2.6.13 Chlorinated Solvent Investigation Report – 2002

A chlorinated solvent investigation was conducted at OU-2 in November 2000 and June 2001 to further delineate the extent of CVOC impact in the Southern Area [B&M, 2002b]. A total of 20 soil borings were completed to depths of 6 to 12 feet bgs and groundwater samples were collected from six of the 20 borings for VOC analyses. The highest CVOC concentration in soil was 4,500 mg/kg of PCE in a sample from 1 foot bgs. The maximum groundwater concentrations were TCE at 960 µg/L, PCE at 1,200 µg/L, cis-1,2-dichloroethene (cis-1,2-DCE) at 44,000 µg/L, trans-1,2-dichloroethene (trans-1,2-DCE) at 700 µg/L, and vinyl chloride at 9,700 µg/L [B&M, 2002b].

[5] This area was identified as impacted by halogenated VOCs (HVOCs) by B&M [2001]. However, the detected chemicals are chlorinated VOCs, and are referred to as CVOCs henceforth.

2.6.14 OU-2 Additional Investigation in Area of CVOC Plume – 2007

Additional soil and groundwater sampling for CVOCs was conducted in 2006, confirming the previously observed extents of CVOC impacts in soil and groundwater [B&M, 2007]. As part of this investigation, six borings were advanced to the top of the YBM (approximately 6 to 12 feet bgs), and two soil samples and two grab groundwater samples were collected from each boring at various depths for VOC analyses. Four CVOCs were detected in shallow boring samples collected from depths of 3 to 6.5 feet bgs, including cis-1,2-DCE (with a maximum concentration of 490 mg/kg), TCE (40 mg/kg), PCE (4,200 mg/kg), and vinyl chloride (2.3 mg/kg). The same four CVOCs were also identified in deeper samples from each boring obtained from depths of 4.5 to 8.5 feet bgs at the following maximum concentrations: cis-1,2-DCE (960 mg/kg), TCE (860 mg/kg), PCE (9,400 mg/kg), and vinyl chloride (3.1 mg/kg).

2.6.15 Groundwater and Surface-Water Monitoring Summary – 2019

Groundwater monitoring in OU-2 has been conducted since the mid-1990s by various consultants on behalf of the owner. Currently, groundwater level measurement and sampling for water quality analysis (TPH, VOCs, and metals) are conducted semi-annually. Construction details for wells located in OU-2 are provided in **Table 1**. In addition to groundwater sampling, surface-water samples from the drainage ditch are collected and analyzed for TPH as part of this semi-annual event.

During the August 2019 semi-annual monitoring event [B&M, 2020], 15 samples from A-Fill zone monitoring wells were analyzed for TPH, five groundwater samples were analyzed for VOCs, one groundwater sample was analyzed for BTEX, and two groundwater samples were analyzed for metals. Results were as follows:

- TPH-g was detected in all 15 samples at concentrations ranging from 0.0315 mg/L (LF-5A) to 0.116 mg/L (MW-15A);
- TPH-d was detected in eight wells at concentrations ranging from 0.0527 mg/L (LF-3A) to 7.48 mg/L (MW-15A);
- TPH-mo was detected in seven wells at concentrations ranging from 0.0553 mg/L (LF-4A) to 2.11 mg/L (MW-11AR);
- Target COPCs including PCE, TCE, 1,1-dichloroethene, trans-1,2-DCE, and vinyl chloride were not detected at or above the method detection limit (MDL). Cis-1,2-DCE was detected only in well MW-15A, which is located in the turntable area, below the reporting limit at 0.320 µg/L;
- Antimony, arsenic, barium, cadmium, chromium, cobalt, copper, lead, molybdenum, nickel, selenium, and zinc were detected in at least one of the two groundwater monitoring wells at relatively low concentrations;
- Surface water stations were dry this monitoring event, but samples were collected from all four locations (i.e., North Ditch, Middle Ditch, South Ditch, and Outfall) in February 2019. TPH-g was detected at all four locations, all below reporting limits, at estimated concentrations ranging from 0.0349 mg/L (South Ditch) to 0.0371 mg/L (Middle

Ditch). TPH-d and TPH-mo were only detected in the North Ditch below the reporting limit at 0.0836 mg/L and 0.0485 mg/L, respectively [B&M, 2020].

2.7 Industrial Way Properties Investigation History

Historical investigations conducted at the Industrial Way Properties are summarized below.

2.7.1 UST Removal from 250 Industrial Way – 1988

A 500-gallon gasoline UST was removed in 1988. Groundwater from the tank excavation was sampled and analyzed for TPH-g and BTEX. TPH-g was detected at a concentration of 9.4 mg/L and BTEX compounds were detected at a maximum concentration of 0.92 mg/L. A groundwater well, originally identified as well W-1 but later designated K-1, was installed at this location [T&R, 1993].

2.7.2 UST Removal from 285 Industrial Way – 1991

One 2,000-gallon underground fuel storage tank, which had reportedly been used for leaded gasoline and diesel, was removed [Geomatrix Consultants, 1991a]. Two soil samples and one groundwater sample were collected from the tank excavation; the soil samples were analyzed for BTEX, TPH-d, TPH-g, and lead, and the groundwater sample was analyzed for BTEX and TPH-g. Analytes were not detected in any of the samples.

2.7.3 UST Removal from 350 Industrial Way – 1991

One 1,000-gallon gasoline UST was removed [Geomatrix Consultants, 1991b]. A 1/2-inchdiameter hole was observed near the north end of the tank. Approximately 20 cubic yards of discolored soil was excavated and stockpiled. Two soil samples were collected, one from each end of the tank excavation, and analyzed for TPH-g, soluble lead (i.e., leaching of lead into water), and BTEX. TPH-g and soluble lead were detected at maximum concentrations of 4,900 mg/kg and 0.45 mg/L, respectively, and BTEX concentrations ranged from 15 to 160 mg/kg. The stockpiled soil had concentrations of TPH-g of 3,900 mg/kg, benzene of 4.1 mg/kg, ethylbenzene of 75 mg/kg, toluene of 22 mg/kg, xylenes of 120 mg/kg, and soluble lead of 0.49 mg/L. The stockpiled soil was aerated and resampled. The composite sample was analyzed for TPH-g and BTEX, and all analytes were below detection limits (1 mg/kg for TPH-g and 0.005 mg/kg for BTEX). The aerated soil was placed as fill at a neighboring parcel at 55 Industrial Way. One groundwater monitoring well, identified as MW-1, was installed in 1992 and screened in the Fill zone [Weiss, 2006]. The monitoring well was destroyed in 2006 [Weiss, 2006].

2.7.4 Soil Investigation – 1991

Geomatrix Consultants drilled eight boreholes and analyzed seven soil samples for BTEX, TPH-g, lead, and copper [T&R, 1992]. A groundwater monitoring well (MW-1) was constructed in one of the boreholes. Benzene, TPH-g, lead, and copper were detected at maximum concentrations of 0.5 mg/kg, 33 mg/kg, 19,000 mg/kg, and 5,200 mg/kg, respectively.

2.7.5 Soil Quality Assessment – 1992

An investigation to assess the possible presence of Bunker C oil and metals in the soil at the Industrial Way properties was conducted [T&R, 1992].

2.7.6 Soil and Groundwater Investigation – 2008

A soil and groundwater investigation was conducted at the locations of the two former USTs at 250 and 350 Industrial Way in Brisbane, California, in 2008 by Weiss Associates [Weiss, 2008]. During the investigation, 13 borings were advanced using direct-push drilling methods for collection of soil and groundwater samples. Because soils in the tank vicinity were impacted historically by TPH-g, TPH-d, and BTEX, samples were analyzed for TPH (gasoline, diesel, and motor oil ranges)[6, 7] and VOCs [Weiss, 2008].

At the 250 Industrial Way location, the following analytes and maximum concentrations were detected in the three soil samples: TPH-d (8.9 mg/kg) and total petroleum hydrocarbons as motor oil (TPH-mo) (21 mg/kg). In the eight groundwater samples collected from temporary wells at this location, the analytes and maximum concentrations detected included TPH-g (2.2 mg/L), TPH-d (2.3 mg/L), TPH-mo (7.2 mg/L), benzene (2.1 µg/L), toluene (35 µg/L), ethylbenzene (2.2 µg/L), and xylenes (11 µg/L).

At the 350 Industrial Way location, the analytes and maximum concentrations detected in the three soil samples included TPH-g (140 mg/kg), TPH-d (310 mg/kg), TPH-mo (71 mg/kg), benzene (0.11 mg/kg), ethylbenzene (0.0055 mg/kg), and xylenes (0.074 mg/kg). In the five groundwater samples collected from temporary wells at this location, the analytes and maximum concentrations detected included TPH-g (1.9 mg/L), TPH-d (3.7 mg/L), TPH-mo (1.9 mg/L), benzene (15 µg/L), toluene (16 µg/L), ethylbenzene (15 µg/L), and xylenes (23 µg/L).

Based on the results of this investigation, the extent of TPH and VOCs was found to be limited and the RWQCB issued a “No Further Action” letter for the USTs in 2008 [RWQCB, 2008].

2.8 Data Gap Investigation – 2019

Between November 2018 and February 2019, over 1,100 Fill soil samples were collected from 551 soil borings and grab groundwater samples were collected from the Fill water-bearing zone in 138 soil borings. Groundwater samples were also collected from 16 existing groundwater monitoring wells. Results from the investigation were documented in the report provided in **Appendix C**.

For purposes of managing data and information, the Site was divided into six investigation zones. The zones were established based on functional activities that were historically associated with the former railyard operations and Industrial Way properties. Investigation zones were established as follows (**Figure 2**):

- Zone 1: Former switching yard north;

[6] TPH-d and TPH-mo were processed using a silica gel cleanup to remove polar organics.
[7] Gasoline carbon range – C6-C10, diesel carbon range – C10-C28, and motor oil carbon range – C28-C40.

- Zone 2: Former switching yard south;
- Zone 3: Former Machine and Erecting Shop;
- Zone 4: Turntable and oil tank area;
- Zone 5: South Disposal Area; and
- Zone 6: Industrial Way properties.

Historical activities at former Site facilities were described in Section 2.2.

2.9 Site Remediation History

In 1998 and 2002, as part of development of a RAP, development-specific cleanup goals were calculated for OU-2 using a risk-based approach for protection of human health and the environment. RAOs contemplated as part of the development of these cleanup goals included the following [B&M, 2002a]:

- Prevention of human contact with Bunker C oil, metals, and CVOCs;
- Prevention of migration of Bunker C oil, metals, and CVOCs to the bay;
- Removal of free product to the extent practicable; and
- Prevention of ecological impacts to surface water at the drainage ditch.

In 2006, the northern portion of the drainage ditch on OU-2 (i.e., the drainage swale, north ditch, and middle ditch; **Figure 2**) was reconstructed. The work included excavation of the root zone, backfilling, and installation of a high-density polyethylene liner in various portions of the work area [B&M, 2005]. Surface water in the drainage ditch in this area of the Site is reportedly no longer in contact with COPCs in the soil.

3. NATURE AND EXTENT OF CONTAMINATION

A summary of the nature and extent of contamination in soil and groundwater at the Site is presented below based on results from the Data Gap Investigation. For comparison purposes, the concentrations of the detected constituents were screened against several published screening criteria, as appropriate. Screening criteria included:

- Mean regional arsenic background concentration of 19 mg/kg [Lawrence Berkeley National Laboratory (LBNL), 2009];[8]
- Environmental Screening Levels (ESLs) for residential, commercial/industrial, and construction worker land uses [RWQCB, 2019a];
- Benzo(a)pyrene equivalent for ambient concentrations in northern California of 0.9 mg/kg [DTSC, 2009a];[9]
- Aquatic habitat goal levels for saltwater ecotoxicity [RWQCB, 2019a].

A summary of the analytical results and screening level comparisons are presented in the following sections.

3.1 Fill Soil

A detailed compilation of Fill soil sampling results at OU-2 is presented in the OU-2 Data Gap Investigation Report in **Appendix C**. Soil samples were collected from 551 locations shown in **Figure 5** at depths ranging from 0.5 to 20 feet bgs.

Soil constituents with concentrations exceeding screening levels in one or more samples were tentatively identified as COPCs and evaluated further in the health risk assessment discussed in Section 4 and provided as **Appendix D**. Based on the analysis in the health risk assessment, the list of risk-driving COCs was generated for the various receptor and exposure pathway combinations (see Section 4.1).

3.1.1 Metals

Metals results of Fill soil samples are presented in **Table 2**. In general, metals were detected at most sample locations at most depths sampled. In general, metals concentrations were greatest in the South Disposal Area, where "*a substantial amount of metal debris and metals 'slag' was observed in the fill materials*", according to historical documents [Levine-Fricke, 1991]. A summary of the notable findings is as follows:

Arsenic (**Figure 6**): Arsenic was detected in all Zones with an apparently higher frequency in Zones 1, 2, and 5. Arsenic was detected at a maximum concentration of 1,400 mg/kg at borings

[8] The proposed arsenic background concentration of 19 mg/kg is consistent with the Schlage OU, UPC OU-SF, and UPC OU-SM, which are all under DTSC oversight. The background value of 19 mg/kg is only applicable for evaluating existing soil at the Site and would not be used for evaluating import fill.

[9] The proposed benzo(a)pyrene equivalents background concentration is consistent with the UPC OU-SM, would be applicable only for evaluating existing soil at the Site, and would not be used for evaluating import fill.

AE5 (Zone 1) and AV5 (Zone 2; 3.5 to 4 feet bgs). For comparison purposes, the arsenic concentrations were compared to the mean regional arsenic background concentration of 19 mg/kg [LBNL, 2009]. Approximately 35% of samples exceeded the 95% upper tolerance limit (UTL)[10] of the mean regional arsenic background concentration of 19 mg/kg. Background exceedances for arsenic were observed at all sample depths; particularly in the northeast portion of the switchyard (Zone 1), concentrations of samples from multiple depths from the same borehole exceeded the background screening criterion. Arsenic is therefore considered a COPC for the Site.

Lead (**Figure 7**): Elevated concentrations of lead were detected in all Zones throughout the Site. The maximum lead concentration detected was 28,000 mg/kg at location AM7 (Zone 2; 7.5 to 8 feet bgs). Lead concentrations exceeded the ESL of 80 mg/kg in approximately 56% of samples. Therefore, lead is considered a COPC for the Site.

Antimony: Antimony was present in a smaller subset of samples and predominantly in Zone 5 (South Disposal Area) with a maximum concentration of 4,300 mg/kg in sample O10 (Zone 3) at a depth of 0.5 to 1 foot bgs. Antimony exceeded the residential ESL in 16% of the soil samples. Therefore, antimony is considered a COPC for the Site.

Maximum concentrations of other metals detected and the percent of samples exceeding the residential ESLs in parenthesis were as follows:

- AN5 (Zone 2) from 0.5-1 foot bgs: 23,000 mg/kg barium (0.1%), 120 mg/kg beryllium (0.1%), 4,400 mg/kg cobalt (3%), and 45,000 mg/kg vanadium (0.1%);
- S15 (Zone 3) from 0.5-1 foot bgs: 120,000 mg/kg copper (2%);
- N15 (Zone 3) from 0.5-1 foot bgs: 22 mg/kg mercury (1%);
- AV10 (Zone 5) from 14.5-15 feet bgs: 3,400 mg/kg nickel (1%); and
- W10 (Zone 1) from 0.5-1 foot bgs: 110 mg/kg thallium (2%).

Based on the concentrations, barium, beryllium, cobalt, copper, mercury, nickel, thallium, and vanadium are considered COPCs for the Site. Chromium, molybdenum, silver, and zinc are not considered COPCs for the Site since no concentrations exceed the residential ESLs. This is consistent with historical site investigations discussed in Section 2.6.

3.1.2 Polynuclear Aromatic Hydrocarbons

PAH concentrations are summarized in **Table 3**. All 17 PAHs in the analytical method were detected in one or more samples. Maximum concentrations of these constituents were detected at the following locations with percent exceeding direct exposure or leaching to groundwater ESLs in parenthesis as applicable:

[10] A tolerance interval is a statistical interval within which, with a specified confidence level, a specified proportion of a sampled population falls. Tolerance intervals are statistical ranges typically constructed from onsite background data. Tolerance limits define the range of data that fall within a specified percentage with a specified level of confidence. The UTL has been commonly used to establish a background threshold value.

- AB13 (Zone 3) from 3.5-4 feet bgs: 14,000 µg/kg benzo(a)pyrene (28%), 8,400 µg/kg benzo(b)fluoranthene (3.2%), 4,700 µg/kg benzo(k)fluoranthene, 76,000 µg/kg 2-methylnaphthalene (4.0%), 25,000 µg/kg acenaphthene (0.3%), 32,000 µg/kg anthracene (2.7%), 19,000 µg/kg benzo(a)anthracene (3.2%), 31,000 µg/kg chrysene (0.5%), 33,000 µg/kg fluorene (0.3%), and 13,000 µg/kg naphthalene (2.4%);
- AS7 (Zone 2) from 0.5 to 1 foot bgs: 7,900 µg/kg benz(a)pyrene, 13,000 µg/kg benzo(b)fluoranthene, 5,000 µg/kg benzo(k)fluoranthene, 12,000 µg/kg benzo(a)anthracene, 14,000 µg/kg chrysene, 980 µg/kg dibenzo(a,h)anthracene (3.0%), 29,000 µg/kg fluoranthene, 2,200 µg/kg indeno(1,2,3-cd)pyrene (1.1%), and 26,000 µg/kg pyrene (0.3%); and
- X1 (Zone 1) from 0.5 to 1 foot bgs: 5,200 µg/kg benzo(a)pyrene, 6,800 µg/kg benzo(b)fluoranthene, 2,300 µg/kg benzo(k)fluoranthene, 4,400 µg/kg benzo(a)anthracene, 6,100 µg/kg chrysene, 1,100 µg/kg dibenzo(a,h)anthracene, 2,600 µg/kg fluoranthene, 3,100 µg/kg indeno(1,2,3-cd)pyrene, 350µg/kg naphthalene, and 6,600 µg/kg pyrene.

Benzo(a)pyrene (BaP) toxicity equivalents (TEQ) were calculated by Geosyntec for each sample and the distribution is presented in **Figure 8**. Concentrations were screened against the 95th percentile BaP equivalent for ambient concentrations in northern California of 0.9 mg/kg [DTSC, 2009a]. Exceedances of the ambient concentration occur in deep samples within the former Oil Tank Area (Zone 4), in several shallow and mid-depth samples in the former Turntable Area (Zone 4), and sparsely throughout the railyard predominantly in shallow samples with a few exceedances in mid-depth and deep samples.

Naphthalene was detected in Fill soil samples at relatively low concentrations across the Site (**Figure 9**). Comparison of the naphthalene concentrations to the residential ESL indicates that screening level exceedances were observed in a limited area in deep samples within the former Oil Tank Area (Zone 4) and at a few locations north of the former Turntable Area (Zone 4). The exceedances of BaP equivalents and naphthalene in the former Oil Tank Area and former Turntable Area correlate with the delineated area of Bunker C Oil impacts in Fill soil (see Section 3.1.3 and B&M, 2002a) suggesting that the Bunker C Oil is the source of the PAH detections in Zone 4.

Based on the concentrations discussed above, acenaphthene, anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(a)fluoranthene, chrysene, dibenzo(a,h)anthracene, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, 2-methylnaphthalene, naphthalene, phenanthrene, and pyrene are COPCs for the Site. Benzo(g,h,i)perylene and benzo(k)fluoranthene are not considered COPCs at the Site since no concentrations exceeded residential ESLs. This is consistent with historical site investigations discussed in Section 2.6.

3.1.3 Total Petroleum Hydrocarbons

TPH concentrations are summarized in **Table 3** and the distribution of TPH-d is shown in **Figure 10**. Based on historical Site characterization, TPH-d (reported by TestAmerica Laboratories, Inc. as carbon chain lengths between C10-C28) and TPH-mo (reported as chain lengths C24-C36) are generally indicative of Bunker C oil (carbon chain lengths C9-C36) rather than diesel or motor oil products as reported by the laboratory.

Maximum concentrations of TPH-d and TPH-mo were 94,000 and 86,000 mg/kg, respectively, at boring AB13 (in Zone 3, the former Oil Tank Area) from 13.5-14 feet bgs. This boring location also had the maximum concentrations of TPH-g (2,400 mg/kg) and 8 of the 17 PAHs quantified. The percent of samples exceeding the residential direct exposure ESL were 28% and 2.4% for TPH-d and TPH-mo, respectively. Concentrations of TPH-d and TPH-mo exceed residential ESLs and are therefore COPCs for the Site. TPH-g did not exceed the residential ESL and is therefore not a COPC for the Site.

TPH-d exceedances are located throughout Zones 3, 4, and 5 (**Figure 10**) and are attributed to the railyard operations within the former Oil Tank Area, the former Turntable Area, the former Machine and Erecting Shop area, and the South Disposal Area, though exceedances were also observed at lower frequency in the former switchyard. Comparison of the current distribution of TPH-d with that interpreted in 2002 (B&M, 2002a) suggests that concentrations have decreased somewhat but the areal extent of TPH-d impacts across the Site has become larger.

3.1.4 Organochlorine Pesticides

OCP concentrations in Fill soil are summarized in **Table 4**. OCPs were detected in approximately 21% of the samples collected. ESLs for groundwater protection were exceeded for dieldrin (six samples) and endrin (four samples). All exceedances except one for dieldrin were in the shallow soil sample, and all exceedances had deeper soil samples that were below residential ESLs indicating that the vertical extent of OCP compounds are limited to the upper few feet of Fill soil

Maximum concentrations of OCPs detected at elevated concentrations and the percent exceeding the leaching to groundwater or resident direct exposure ESLs in parenthesis, if any, were as follows:

- AV9 (Zone 5) from 0.5-1 foot bgs: 120 µg/kg dichlorodiphenyldichloroethane (4,4-DDD), 280 µg/kg dichlorodiphenyldichloroethene (4,4-DDE), 220 µg/kg dichlorodiphenyltrichloroethane (4,4-DDT), 61 µg/kg alpha-chlordane, 340 µg/kg chlordane, and 51 µg/kg gamma-Chlordane;
- AD9 (Zone 1) from 3.5-4 feet bgs: 1.0 µg/kg alpha-BHC,
- AU7 (Zone 2) from 3.5-4 feet bgs: 2.5 µg/kg beta-BHC;
- AM7 (Zone 2) from 0.5-1 foot bgs: 28 µg/kg dieldrin (1.7%);
- AK7 (Zone 2) from 0.5-1 foot bgs: 30 µg/kg endrin (0.9%);
- AT12 (Zone 6) from 3.5-4 feet bgs: 6.6 µg/kg endrin aldehyde;
- Z17 (Zone 4) from 0.5-1 foot bgs: 0.7 µg/kg endrin ketone; and
- X9 (Zone 1) from 3.5-4 feet bgs: 20 µg/kg gamma-BHC (0.3%).

Therefore, dieldrin, endrin, and gamma-BHC are considered COPC and the remaining OCPs are not considered COPCs for the Site.

3.1.5 Polychlorinated Biphenyls

PCB results are summarized in **Table 4** and **Figure 11**. Of the six Aroclors reported, only Aroclor 1254 and Aroclor 1260 were detected above MDLs. Total detected Aroclor concentrations equaled or exceeded the residential ESL of 230 µg/kg in the following shallow (0.5-1 foot bgs) samples:

- In Zone 1, S7 (380 µg/kg), AA7 (710 µg/kg), and AF5 (600 µg/kg); and
- In Zone 2, AI7 (1,500 µg/kg), AJ5 (320 µg/kg), AJ9 (820 µg/kg), AK7 (940 µg/kg), AM7 (430 µg/kg), AO7 (440 µg/kg), and AV5 (740 µg/kg).

Residential ESL exceedances at the 3.5-4 foot bgs depth interval were observed in the following samples:

- In Zone 1, Q7 (520 µg/kg), and S7 (5,300 µg/kg); and
- In Zone 6, AU11 (1,320 µg/kg).

A deeper sample at AU11 (9.5-10 feet bgs) did not exceed the residential ESL; per the Data Gap Investigation Work Plan, deeper samples were not collected at locations Q7 and S7. Three samples (AI7 and AU11 at 0.5 to 1 foot bgs and S7 at 3.5 to 4 feet bgs) exceeded a concentration of 1,000 µg/kg.

The percent of samples to exceed the residential direct exposure ESL was 4.5%. These appear to be isolated detections that are statistically insignificant findings for the Site as a whole. The detections do not correlate to any apparent PCB sources at those locations but could be a legacy of the historical fill material placed at those locations. Fill placement concluded in 1935 and major railyard operations ceased in 1982. The maximum total PCBs concentration during historical investigations was 28 µg/kg. Based on the concentrations, PCBs as Aroclor 1254 and Aroclor 1260 are considered COPCs and the remaining PCBs are not considered COPCs for the Site.

3.1.6 Volatile Organic Compounds

VOC results are summarized in **Table 5** and CVOC results are shown in **Figure 12**. Exceedances of the lowest ESL (i.e., direct contact or leaching to groundwater) were as follows:

- Benzene: AH13 (Zone 4) from 7.5 to 8 feet bgs (82 µg/kg), R13 from 0.5 to 1 foot bgs (2,300 µg/kg), and T17 (Zone 3) from 0.5 to 1 foot bgs (450 µg/kg), 0.78% of samples exceed the leaching to groundwater ESL;
- Ethylbenzene: AB13 (Zone 4) from 13.5 to 14 feet bgs (730 µg/kg) and AD13 (Zone 4) from 7.5 to 8 feet bgs (590 µg/kg), 0.52% of samples exceed the leaching to groundwater ESL;
- Naphthalene: AB13 (Zone 4) from 13.5 to 14 feet bgs (7,400 µg/kg), AC15 (Zone 4) from 7.5 to 8 feet bgs (1,400 µg/kg), AD13 (Zone 4) from 7.5 to 8 feet bgs (4,100 µg/kg), and R15 (Zone 3) from 3.5 to 4 feet bgs (2,900 µg/kg), 1.3% of samples exceed the leaching to groundwater ESL; and

- TCE: Y15 (Zone 4) from 7.5 to 8 feet bgs (100 µg/kg), 0.003% of samples exceed the leaching to groundwater ESL.

Based on the concentrations, benzene, ethylbenzene, naphthalene, and TCE are considered COPCs.

Elevated concentrations of chlorinated VOCs in Fill soil were previously observed in a limited area in Zone 4 between the former Turntable and the former Oil Tank [B&M, 2007]. In the vadose-zone soil samples collected in 2006, PCE, TCE, vinyl chloride, and cis-1,2-DCE were detected at maximum concentrations of 9,400 mg/kg, 860 mg/kg, 3.1 mg/kg, and 960 mg/kg, above residential direct contact ESLs. In this investigation, though samples were not collected from the original locations, PCE, TCE, vinyl chloride, and cis-1,2-DCE were not detected in soil samples above the residential ESLs anywhere on the Site. PCE, TCE, vinyl chloride, and cis-1,2-DCE are considered COPCs based on the historical concentrations.

All remaining VOCs are not considered COPCs since concentrations do not exceed residential or leaching to groundwater ESLs.

3.1.7 Asbestos

Asbestos was not detected in any soil samples; there is no evidence of the presence of asbestos in soils at the Site. Asbestos is not considered a COPC for the Site.

3.1.8 Pentachlorophenol

Pentachlorophenol (PCP) was allegedly used as a preservative in the manufacture of glue and fertilizer from animal hides and bones by tenants of 55 Industrial Way prior to the mid-1960s (**Figure 2**) [T&R, 1993]. The process reportedly included several other chemicals including sulfuric acid, chromium, zinc, and petroleum hydrocarbons [T&R, 1993]. Although soil samples from this area have not been analyzed specifically for PCP, multiple lines of evidence indicate that PCP impacts likely do not exist in this area. First, pentachlorophenol is biodegradable and lasts in soil for hours to days [Agency for Toxic Substances and Disease Registry (ATSDR), 2001]. A variety of microorganisms have demonstrated the ability to degrade PCP under aerobic and anaerobic conditions [McAllister et al., 1996].

Second, chromium, zinc, and TPH concentrations in Fill soil are not elevated relative to other Industrial Way properties or the railyard (**Table 2**). Chromium concentrations in soil in this area range from approximately 30 mg/kg to 150 mg/kg, which is consistent with regional background [e.g., LBNL, 2009] and several orders of magnitude below the residential ESL of 120,000 mg/kg. Also, the maximum zinc concentration in this area is 15,000 mg/kg (AC15), well below the residential ESL of 23,000 mg/kg. And TPH in this area has been characterized as Bunker C fuel from the adjacent former Oil Tank [B&M, 2000], not a waste from the glue and fertilizer manufacture process.

Third, 16 groundwater monitoring wells screened in the Fill zone (listed in **Table 6**, excluding MK-1A) were sampled and tested for PCP and all samples were non-detect below laboratory reporting limits (ranging from 9.5 to 10 µg/L), including at wells MW-7A and MW-13A located at the boundary between the Industrial Way properties and the railyard (analytical data provided

in Appendix G of the Data Gap Investigation Report). As such, neither soil data nor groundwater data provide evidence of a release to the environment of chemicals associated with the manufacture of glue and fertilizer.

Finally, were PCP identified as a COPC, the preferred remedy described in Section 7 would not change. According to ASTDR [2001], when PCP is released to the environment, "most of it will move with water and generally stick to soil particles" and "not much will evaporate." And as noted above, PCP generally degrades rapidly in soil. Nonetheless, as discussed in Section 7.1, additional soil screening will be conducted at the Industrial Way properties following demolition of the existing buildings, and soil samples will be analyzed to confirm that PCP is not present in soil.

3.2 Soil Vapor

Representative samples of soil vapor will be collected at the Site prior to vertical development for review by RWQCB, as documented in the Data Gap Investigation Work Plan [Geosyntec, 2018]. The data will be used to conduct a vapor intrusion evaluation for buildings that will be constructed and occupied in the development. Given anticipated Site modification (e.g., by regrading) and planned groundwater remediation, all of which may affect the potential for a vapor intrusion condition, soil vapor confirmation sampling following active remediation and prior to building construction is appropriate.

3.3 Groundwater

Groundwater sampling results at the Site are presented in the OU-2 Data Gap Investigation Report in **Appendix C**. Grab and well groundwater samples were collected from 138 locations shown in **Figure 13**. Groundwater elevations at the time of sampling during the data gap investigation (i.e., December 2019) are provided in **Table 6**. Since Fill groundwater at the Site is exempt from beneficial use, the only complete exposure pathways are: (1) migration to San Francisco Bay; and (2) migration through soil vapor by VOCs. RWQCB ESLs have not been developed for the vapor intrusion pathway for SVOCs or TPH [RWQCB, 2019a]. Thus, dissolved metals, SVOCs, and TPH were screened against saltwater ecotoxicity ESLs with a 100-fold attenuation factor to account for sorption and dilution that would occur in groundwater as it migrated over the approximately half-mile between the Site and San Francisco Bay/Guadalupe Lagoon, and VOCs were screened against the minimum of the lowest vapor intrusion ESL and the saltwater ecotoxicity ESL with a 100-fold attenuation factor.

3.3.1 Dissolved Metals

Dissolved metals concentrations in grab groundwater and monitoring well samples are summarized in **Table 7**. All tested metals concentrations in Fill groundwater were below the screening criteria with the exception of arsenic at AV5 and copper at AJ5. Arsenic, lead, copper, and nickel had the highest concentrations relative to their screening criteria (**Figure 14**). As commonly observed, dissolved metals concentrations were generally greater in grab groundwater samples than in samples from groundwater monitoring wells.

The maximum concentrations of dissolved metals were as follows:

- Antimony, arsenic, and thallium were 50 µg/L, 4,300 µg/L, and 43 µg/L, respectively, all at location AV5 (Zone 2);
- Beryllium, cadmium, chromium, cobalt, lead, copper, nickel, and vanadium were 4.7 µg/L, 4.1 µg/L, 380 µg/L, 77 µg/L, 320 µg/L, 450 µg/L, 420 µg/L, and 280 µg/L, respectively, at location AJ5 (Zone 2);
- Barium was 2,400 µg/L at location LF-4A (Zone 4);
- Hexavalent chromium was 48 µg/L at location AD13 (Zone 4);
- Mercury was 0.28 µg/L at location X9 (Zone 1);
- Molybdenum was 43 µg/L at location R9 (Zone 3);
- Selenium was 7.2 µg/L at location N9 (Zone 3);
- Silver was 2.8 µg/L at location AO7 (Zone 2); and
- Zinc was 670 µg/L at location MK-8A (Zone 5).

Only 0.01% of arsenic and copper samples exceeded the site-specific screening levels. During an investigation in 1985, maximum concentrations for barium, chromium, and zinc were 2,930 µg/L, 1,810 µg/L, and 4,880 µg/L, respectively (Ecology & Environment, Inc., 1985). During an investigation in 1997 in the Oil Tank and Turntable area, maximum concentrations of lead and copper were 12,000 µg/L and 4,500 µg/L, respectively. Elevated concentrations of dissolved metals, arsenic being the most prevalent, are generally localized in the eastern side of the Site and decrease over relatively short distances. For example, the highest dissolved arsenic concentration within approximately 200 feet of AV5 is 100 µg/L at AX5, a 43-fold concentration reduction. This trend is consistent with the distribution of arsenic in soil, for which elevated concentrations were observed primarily in the former switchyard (Zones 1 and 2) adjacent to the tracks. The concentration data and the hydraulic gradients discussed in Section 2.4 indicate that lateral migration of dissolved metals in Fill groundwater is not substantial. Arsenic, chromium, copper, lead, and zinc are metals to exceed the site-specific screening level and are therefore the dissolved metals to be considered COPCs.

3.3.2 Semi-Volatile Organic Compounds

Results for PAHs, a subset of SVOCs, are summarized in **Table 8**.[11] PAHs were generally detected below laboratory reporting limits with only naphthalene and phenanthrene exceeding their ESLs in two and five samples, respectively. The maximum concentrations of PAHs were:

- Acenaphthylene was 0.64 µg/L at location Y15 (Zone 4);
- Anthracene was 2.2 µg/L at locations AE11 (Zone 4), AK11 (Zone 4), and U11 (Zone 3);

[11] The analytical method for full-scan SVOCs was USEPA Method 8270C and the method for PAHs was USEPA Method 8270C-SIM.

- Benzo(a)anthracene and benzo(k)fluoranthene were 1.2 µg/L and 0.77 µg/L, respectively, at location AS3 (Zone 2);
- Benzo(a)pyrene, benzo(b)fluoranthene, chrysene, fluoranthene, and pyrene were 2.3 µg/L, 2.4 µg/L, 3.3 µg/L, 4.0 µg/L, and 5.7 µg/L, respectively, at location AK11 (Zone 4);
- Benzo(g,h,i)perylene and indeno(1,2,3-cd)pyrene were 2.5 µg/L and 1.9 µg/L, respectively, at AJ5 (Zone 2);
- Dibenzo(a,h)anthracene was 0.31 µg/L at AW3 (Zone 2);
- Fluorene was 5.6 µg/L at AG11 (Zone 4);
- Naphthalene was 41 µg/L at location AK15 (Zone 6); and
- Phenanthrene was 10 µg/L at locations AE11 (Zone 4) and AG11 (Zone 4).

Groundwater samples from 16 Fill groundwater monitoring wells were non-detect for all SVOCs, including PCP (**Appendix C**). These low concentrations are consistent with the relatively low water solubility of SVOCs. In an investigation conducted by B&M in 1997 in the Oil Tank and Turntable area, there was a maximum concentration of 590 µg/L for phenanthrene. No concentrations of SVOCs in groundwater exceed site specific screening levels and therefore are not considered COPCs for the Site.

3.3.3 Total Petroleum Hydrocarbons

Concentrations of TPH-g, TPH-d, and TPH-mo in groundwater are summarized in **Tables 8** and **9** and **Figure 15**. The maximum concentration of TPH-g was 2,300 µg/L at location AA11 (Zone 4), and maximum concentrations for TPH-d and TPH-mo were 21,000 µg/L and 9,900 µg/L at location AD13 (Zone 4). Both AA11 and AD13, as well as most TPH-d exceedances, are located within the former Oil Tank Area and the former Turntable Area (Zone 4). TPH-d exceedances were also observed in the former switchyard adjacent to the tracks and along Industrial Way. No concentrations of TPH in groundwater exceed the site-specific screening levels and are therefore not considered COPCs at the Site.

3.3.4 Volatile Organic Compounds

Petroleum-related VOC results in groundwater are presented in **Table 9,** and the distributions of benzene, ethylbenzene, and naphthalene in groundwater are shown in **Figure 16**. Petroleum VOC concentrations that exceed the vapor intrusion residential screening level are located within Zone 4 and Zone 6. Maximum concentrations of petroleum VOCs were:

- Benzene and ethylbenzene were 14 µg/L and 7.3 µg/L, respectively, at AI15 (Zone 6), and percent of samples exceeding the vapor intrusion ESL were 1.6% and 0.3%, respectively;
- Naphthalene was 45 µg/L at AK15 (Zone 6) and percent of samples exceeding the vapor intrusion ESL was 0.5%;
- Toluene was 15 µg/L at AD13 (Zone 4) with no samples exceeding ESLs; and

- Xylene was 16 µg/L at AI15 (Zone 6), with no samples exceeding ESLs.

During an investigation completed by Weiss in 2008, the maximum groundwater concentrations for benzene, ethylbenzene, and toluene were 15 µg/L, 15 µg/L, and 35 µg/L, respectively in Zone 6 [Weiss, 2008]. The locations yielding samples with the highest petroleum VOC detections form a roughly linear north-south pattern stretching from the historical tank and boiler shop to about 1,560 feet due south of the historical oil tank area along row 15 (**Figure 16**). The distribution of petroleum VOCs in Fill groundwater exceeding ESLs is generally smaller in extent as compared to the previously delineated Bunker C impacted area [B&M, 2002a]. The elevated petroleum VOC concentrations are well confined to this area and contaminant migration appears to be minimal.

Chlorinated VOCs were detected in groundwater at relatively low concentrations (**Figure 17**). PCE, TCE, cis-1,2-DCE, and vinyl chloride were detected at maximum concentrations of 0.98 µg/L, 6.1 µg/L, 45 µg/L, and 9.7 µg/L, respectively. Percent of samples exceeding the vapor intrusion ESL for PCE and vinyl chloride were 1.0% and 2.0%, respectively. 1,1-dichloroethane was detected at a maximum concentration of 52 µg/L at location Y15 (Zone 4) with 0.5% of samples exceeding the vapor intrusion ESL. Locations Y15, AC15, and AD13 (Zone 6 and Zone 4, respectively) were near the area of previously identified chlorinated VOC impacts to groundwater, where maximum PCE, TCE, cis-1,2-DCE, and vinyl chloride concentrations were historically at levels of 26,000 µg/L, 15,000 µg/L, 150,000 µg/L, and 80,000 µg/L, respectively [B&M, 2007]. In 1989, HCI recorded maximum concentrations of PCE and TCE in groundwater of 48,000 µg/L and 1,900,000 µg/L, respectively (HCI, 1989).

Comparison of the current reported groundwater concentrations with the vapor intrusion residential ESLs indicates that PCE exceeds the screening criteria at S15 (Zone 3), Y15 (Zone 4), and MK8A (Zone 5). Vinyl chloride exceeds the screening criteria at AC15, AD13, AE11, AG11, AH5, AH13, AK11, AK15, AO11, all within Zones 4 and 6.

Based on the comparison of the groundwater to vapor intrusion pathway ESLs, benzene, 1,1-dichloroethane, cis-1,2-DCE, ethylbenzene, naphthalene, PCE, trans-1,2-DCE, TCE, and vinyl chloride are considered COPCs in groundwater at the Site. The remaining VOCs are not considered COPCs at the Site since no concentrations exceed ESLs.

3.4 Surface Water

The drainage swale in the former switching yard, the North Ditch, and the Middle Ditch (**Figure 2**) were previously recognized as potential pathways for exchange with groundwater and were reconstructed and lined with high density polyethylene (HDPE) in 2006 [UPC, 2011a]. Results for surface water samples analyzed for TPH fractions are available from as early as 2005. Maximum concentrations of Bunker C Oil and TPH-d (reported as Diesel Fuel #2) in surface water were observed in December 2005; bunker C Oil was detected in a sample from the North Ditch at a concentration of 9,600 µg/L, and Diesel Fuel #2 concentration of 2,800 µg/L. During the same sampling event, a surface water sample from the "outflow" of the ditch system within the South Disposal Area (Zone 5) had a Bunker C concentration of 3,800 µg/L and a Diesel Fuel #2 concentration of 950 µg/L [B&M, 2006]. By December 2007, the concentrations of Bunker C and Diesel Fuel #2 had reduced four-fold to 2,400 µg/L and 520 µg/L, respectively in the North Ditch, with a smaller reduction to 1,900 µg/L and 280 µg/L, respectively, at the "outflow".

During the most recent surface water sampling event with adequate surface water volume to sample at least one location (i.e., February 2019), samples were collected from the North Ditch, Middle Ditch, South Ditch, and the "outflow", and analyzed for TPH-g, TPH-d, and TPH-mo. Results from the sampling event are as follows [B&M, 2020]:

- TPH-g concentrations at all four locations were below reporting limits, at estimated concentrations ranging from 34.9 µg/L (South Ditch) to 37.1 µg/L (Middle Ditch);
- The TPH-d concentration in the North Ditch was below the reporting limit, at 83.6 µg/L, and not detected above the MDL of 33.3 µg/L in the other three samples; and
- The TPH-mo concentration in the North Ditch was below the reporting limit, at 48.5 µg/L, and not detected above the MDL of 33.3 µg/L in the other three samples.

Contaminant transport in surface water within the ditch system, the primary surface drainage for the former railyard, is minimal, as recent monitoring shows that Site COPCs in surface water are not being transported offsite. Since the Industrial Way properties are paved, COPCs in the subsurface from historical Site use do not impact surface water. Thus, COPC transport in surface water is not considered further in this document.

4. SITE-SPECIFIC HEALTH RISK ASSESSMENT

A Site-specific HRA and the development of risk-based CULs for remediation are described in this section. The objective of the HRA is to provide an analysis of potential health effects to future Site users (e.g., workers and residents), offsite residents, and aquatic receptors or marine organisms in San Francisco Bay, from exposure to chemicals detected at the Site. The HRA is provided as **Appendix D** and summarized below. The development of CULs and their application are presented in Sections 4.2 and 4.3, respectively.

4.1 Baseline HRA

A baseline HRA was conducted to provide risk managers a basis for evaluating whether action to mitigate potential health risks is warranted to support redevelopment of the Site. The assessment also identifies the media and chemicals detected at the Site that may require further evaluation, risk management, and/or remediation measures to protect future Site users and aquatic receptors during and following development of the Site. To establish a baseline, this HRA was conducted under a hypothetical scenario that assumed no further remedial actions or mitigation measures would be implemented prior to Site development. It also employed conservative assumptions and used age-adjusted risk factors (e.g., assumptions protective of fetuses and children).

Future redevelopment of the Site will likely include uses for high-density residents, commercial/industrial buildings, research and development laboratories, retail, and recreational and open space. Based on these possible future uses and other Site considerations, potentially exposed receptors include:

- A future resident;
- A future commercial, industrial, and/or retail worker;
- A future construction worker;
- A future recreational user;
- An offsite receptor that could potentially be exposed to dust from the Site; and
- Marine organisms in San Francisco Bay, given the COPCs in groundwater and the Site's proximity to the bay.

Since potential exposures to a recreational user are likely to be much less frequent and lower than the daily exposure assumed for a future resident or worker, the analysis of the resident or worker exposure scenario is more conservative than the recreational user scenario.

The potentially complete exposure pathways for these human receptors include:

- Incidental ingestion of soil, dermal contact with soil, and inhalation of particulates or volatiles in ambient air (future worker, resident, and construction worker);
- Inhalation of chemicals in soil vapor migrating through the soil column and an at-grade building foundation into indoor air (future worker and resident);

- Inhalation of volatile COPCs migrating from soil vapor into ambient air within a trench (future construction worker)[12];
- Inhalation of dust from the Site by an offsite receptor; and
- Potential leaching of chemicals in soil to groundwater and offsite transport of COPCs in groundwater to the bay.

The HRA evaluated both potential noncancer hazard indices and cancer risk for a future worker (including construction and commercial workers) and a future resident in a manner consistent with current California Environmental Protection Agency (Cal-EPA) and the USEPA guidance. The assessment evaluated potential noncarcinogenic hazard based on the comparison of the calculated noncarcinogenic hazard index (HI) to Cal-EPA and USEPA's point of departure level of an HI of 1. That is, if the calculated HI for a receptor to chemicals detected in soil and groundwater is less than 1, no further evaluation is necessary, and it can be concluded that no unacceptable risks are present. The USEPA explained the use of an HI as follows: "*Aggregate exposures equal to or below a hazard index (HI) of 1.0 derived using target organ specific hazard quotients likely will not result in adverse noncancer health effects over a lifetime of exposure and would ordinarily be considered acceptable. However, an HI greater than 1.0 does not necessarily suggest a likelihood of adverse effects nor does it imply an unacceptable level of effect*" [USEPA, 2011].

For evaluating potential cancer risk associated with exposure to chemicals, a lifetime incremental increase in cancer risk in the range of 1×10^{-6} to 1×10^{-4} is generally considered to be acceptable [USEPA, 1990]. These values correspond to one additional cancer case in 10,000 people (1×10^{-4}) and one additional case in one-million people (1×10^{-6}) above the baseline lifetime cancer risk. The 1×10^{-6} risk level is considered a *de minimis* risk and is generally used as a point of departure for making risk management decisions at a site. With a risk of 1×10^{-4} or greater, an evaluation of remedial measures is required. The risk range between 1×10^{-6} to 1×10^{-4} is commonly called the "discretionary risk range" to assess whether a response action is warranted depending upon site-specific conditions. This risk range is in addition to the background risk of Americans in the general population developing cancer from causes unrelated to a Site-specific exposure. The background risk is one chance in three (0.3 or 3×10^{-1}) for an American female, and one chance in two (0.5 or 5×10^{-1}) for an American male of eventually developing cancer [American Cancer Society, 2017].

As a risk management policy, the Cal-EPA generally considers 1×10^{-6} to be a point of departure for purposes of making risk management decisions. For a future worker, the point of departure is an HI of 1 and excess cancer risk of 1×10^{-5} (the "mid-point" of the risk management range and commonly used for managing commercial/industrial land uses). For a future resident, an HI of 1 and excess cancer risk of 1×10^{-6} were used as acceptable target levels (the 1×10^{-6} risk level is considered the accepted point of departure for unrestricted land use). These target thresholds are consistent with the federal and state criteria described above.

[12] Direct contact to groundwater is not considered a complete pathway for construction workers because trenches are typically dewatered prior to construction worker entry. Any excavation activities potentially resulting in exposure to COCs in soil or groundwater will require a RWQCB-approved soil management plan (see Section 6.3).

Since arsenic has been identified as a COPC and is naturally occurring, typically at concentrations greater than risk-based screening levels, the HRA evaluated the significance of arsenic by estimating the incremental risk and hazard from potential exposures to arsenic concentrations above naturally occurring background levels. The incremental excess lifetime cancer risk and noncancer hazard is the difference between exposure to arsenic in soil and arsenic as background. For consistency across operable units at the Brisbane Baylands development, the same background concentration for arsenic is proposed for OU-2 that has been adopted for other operable units (i.e., 19 mg/kg, based on the study conducted by the LBNL [2009]).[13] Similarly, there are many natural sources of PAHs in the environment as PAHs are found in virtually all surface soils in both urban and rural areas. As such, the HRA evaluated the significance of PAHs, particularly carcinogenic PAHs, by estimating the incremental risk and hazard from potential exposures above naturally occurring background levels. For this Site, an ambient background concentration of 0.9 mg/kg, equal to the 95th percentile benzo(a)pyrene equivalent value from the northern California ambient data set [DTSC, 2009a] was used. This value was also proposed for the adjacent UPC OU-SM [Geosyntec, 2019b].

The baseline risk assessment used groundwater VOC concentrations for the vapor intrusion pathway because soil vapor data were last collected at OU-2 in 1990 and are not considered representative of current site conditions. After capping at the Site and prior to vertical construction, soil vapor samples will be collected, and the potential risk related to vapor intrusion into occupied buildings will be re-evaluated.

Given the distribution of chemicals detected in soil, separate exposure areas were evaluated and include: (1) all areas of the Site excluding Zone 4; (2) Zone 4; and (3) Area of the chlorinated VOC Plume (boundary between Zone 4 and Zone 6).

4.1.1 Future Commercial/Industrial/Retail Worker

For a future worker, in the absence of any remediation or mitigation efforts, the cumulative HI and cumulative excess lifetime cancer risk from COPCs in soil are 17 and 2×10^{-4}, respectively. Arsenic and lead are the risk-driving COPCs. The hazard quotients (HQs) (i.e., the ratio of the potential exposure to a substance and the level at which no adverse effects are expected) and cancer risks for all other COPCs are less than 1 and 1×10^{-6}, respectively. For arsenic, the estimated noncancer HQ and excess lifetime cancer risk are 16 and 2×10^{-4}, respectively. However, the estimated background noncancer HQ and excess lifetime cancer risk from naturally occurring arsenic are 5.3 and 6×10^{-5}, respectively. Based on these estimates, the incremental noncancer hazard and excess lifetime cancer risk is the difference between baseline and background. The incremental noncancer hazard and excess lifetime cancer risk from arsenic in soil are 11 and 1×10^{-4}, respectively. The results of the assessment indicate that the incremental increase in risk over background is approximately two times higher than baseline.

Within Zone 4, in the absence of any remediation or mitigation efforts, the cumulative HI and cumulative excess lifetime cancer risk from COPCs in soil are 7.3 and 4×10^{-5}, respectively. Lead and TPH-d are the risk-driving COPCs. The estimated 95% upper confidence limit (UCL) for

[13] DTSC approved the Schlage OU FS/RAP in a letter dated 16 November 2009 [DTSC, 2009b].

arsenic is 12.6 mg/kg and below naturally occurring background. Without arsenic as a COPC in soil, the cumulative HI and cancer risk are 3.7 and 3×10^{-6}, respectively.

Within the area of the chlorinated VOC, in the absence of any remediation or mitigation efforts, the cumulative HI and cumulative excess lifetime cancer risk from COPCs in soil are 64 and 2×10^{-3}, respectively. PCE is the primary risk-driving COPC. Other COPCs contributing to the cumulative risk and HI are cis-1,2-DCE, TCE, and vinyl chloride.

For volatile COPCs in groundwater potentially migrating from the top of the water table into indoor air of future structures, vinyl chloride is the primary risk-driving COPC. Within the CVOC plume, cis-1,2-DCE, ethylbenzene, PCE, trans-1,2-DCE, TCE, and vinyl chloride exceed commercial/industrial screening levels.

4.1.2 Future Resident

For a future resident, in the absence of any remediation or mitigation efforts, the baseline cumulative HI and cumulative excess lifetime cancer risk from COPCs in soil are 230 and 9×10^{-4}, respectively. Arsenic, lead, and TPH-d are the risk-driving COPCs. For arsenic, the estimated noncancer HQ and excess lifetime cancer risk are 220 and 9×10^{-4}, respectively. The estimated background noncancer HQ and excess lifetime cancer risk to arsenic are 73 and 3×10^{-4}, respectively. The incremental noncancer hazard and excess lifetime cancer risk to arsenic in soil are 150 and 6×10^{-4}, respectively. The incremental increase in risk for arsenic over background is approximately two times higher than baseline. Similarly, while the estimated cancer risk to BaP TEQ is 6×10^{-6}, the 95% UCL of 0.61 mg/kg is lower than the background concentration of 0.9 mg/kg.

Within Zone 4, the cumulative HI and cumulative excess lifetime cancer risk from COPCs in soil are 69 and 2×10^{-4}, respectively. Lead and TPH-d are the risk-driving COPCs. The estimated 95% UCL for arsenic is 12.6 mg/kg and below naturally occurring background. Without arsenic as a COPC, the cumulative excess lifetime cancer risk from COPCs in soil are 20 and 3×10^{-5}, respectively. The HQs and cancer risks for all other COPCs are less than 1 and 1×10^{-6}, respectively.

Within the area of the CVOC plume, the cumulative HI and cumulative excess lifetime cancer risk from COPCs in soil are 290 and 9×10^{-3}, respectively. PCE is the primary risk-driving COPC. Other COPCs contributing to the cumulative risk and HI are cis-1,2-DCE, TCE, and vinyl chloride.

For volatile COPCs in groundwater potentially migrating from top of the water table into indoor air of future structures, benzene and vinyl chloride exceed residential screening levels. Within the CVOC plume, cis-1,2-DCE, ethylbenzene, PCE, trans-1,2-DCE, TCE, and vinyl chloride exceed residential screening levels.

4.1.3 Future Construction Worker

For a future construction worker, without any Site remediation or mitigation, the cumulative HI and cumulative excess lifetime cancer risk from COPCs in soil are 58 and 3×10^{-5}, respectively. Arsenic and lead are the primary risk-driving COPCs. For arsenic, the estimated noncancer HQ and excess lifetime cancer risk are 54 and 3×10^{-5}, respectively. The estimated background noncancer hazard quotient and excess lifetime cancer risk to arsenic are 19 and 9×10^{-6}, respectively. The HQs and cancer risks for all other COCs are less than 1 and 1×10^{-6}, respectively.

Within Zone 4, the cumulative HI and cumulative excess lifetime cancer risk from COPCs in soil are 79 and 3×10^{-5}, respectively. Arsenic, lead, and TPH-d are the risk-driving COPCs. The HQs and cancer risks for all other COPCs are 1 and 1×10^{-6} or less, respectively.

Within the area of the CVOC plume, in the absence of any remediation or mitigation efforts, the cumulative HI and cumulative excess lifetime cancer risk from COPCs in soil based on the maximum concentrations are 88 and 3×10^{-4}, respectively. PCE is the primary risk-driving COPC. Other COPCs contributing to the cumulative risk and HI are cis-1,2-DCE and TCE.

For volatile COPCs potentially migrating from groundwater into trench air, without any Site remediation or mitigation, the cumulative HI and cumulative excess lifetime cancer risk are 0.3 and 4×10^{-8}, respectively. Within the area of the CVOC plume, the cumulative HI and cumulative excess lifetime cancer risk are 350 and 5×10^{-3}, respectively; cis-1,2-DCE, PCE, TCE, and vinyl chloride are the risk-driving COPCs.

4.1.4 Offsite Receptors

Chemicals detected in soil at the Site may become airborne due to wind conditions and leave the Site in the form of fugitive dust emissions. Nonvolatile compounds (e.g., SVOCs and metals) can adhere to soil particles then become airborne due to wind erosion, which could generate dust containing COPCs. Potential exposure to these chemicals may then occur via inhalation of airborne fugitive dust at offsite locations. A particulate emission factor that relates the concentration of a soil constituent to the concentration of dust particles in air [USEPA, 2002] indicates that, in the absence of any remediation or mitigation efforts, the cumulative HI and cumulative excess lifetime cancer risk from COPCs in air as fugitive dusts from soil are less than 1 and 1×10^{-6}, respectively, for both an offsite worker and offsite resident. Thus, potential exposure to COPCs in soil from the Site migrating as fugitive dust does not pose an unacceptable health risk to offsite receptors. Refer to **Appendix D** for additional details.

In addition, action levels were estimated assuming short-term exposures to airborne particles 10 microns or smaller in diameter (PM_{10}) and to COPCs adhered to dust that may be present in air along the perimeter of the Site. The evaluation showed that compliance with the action level for PM_{10} would keep concentrations of COPCs adhered to dust that may be generated during construction activities within the acceptable risk range. Dust generated from onsite operations will be mitigated following Bay Area Air Quality Management District guidance.

4.1.5 Aquatic Receptors

Groundwater concentrations were compared to surface water screening levels for a marine habitat. Potential exposures to aquatic receptors from COPCs in groundwater are not expected to pose a significant risk to aquatic organisms because the shoreline of the San Francisco Bay is located approximately 0.5 miles east of the Site and attenuation (e.g., adsorption) and dilution are expected to occur. Surface water screening levels for a marine habitat used in the analysis do not consider dilution and/or attenuation of groundwater upon discharge to surface water.[14] The detected

[14] As discussed in Section 3.4, the migration of surface water from the Site to offsite water bodies is not a contaminant transport mechanism.

concentrations of dissolved constituents in groundwater at the Site prior to entering the San Francisco Bay would likely be reduced 100-fold or greater due to factors such as adsorption of dissolved constituents to soil and dilution effects from tidal influence. Based on an attenuation factor of 100 that has been used at other bayfront sites (e.g., Mission Bay, San Francisco International Airport, and East Bay Regional Shoreline Park), the estimated 95% UCL of the mean for chemicals in shallow groundwater are below surface water screening levels for a marine habitat.

A comparison of groundwater concentrations within the area of the CVOC plume to aquatic screening criteria indicate that PCE was detected above the aquatic screening criterion with an attenuation factor of 100 at only one location. The elevated concentration of PCE in groundwater appears to be localized and PCE is not expected to be a risk-driving COPC to aquatic receptors, as a single measurement of a chemical is not representative of the concentration to which an individual organism would be exposed across the entire Site.

Based on the analysis, COPCs in groundwater are not expected to pose a significant risk to aquatic organisms as a result of shallow groundwater potentially migrating from the Site to the San Francisco Bay. Action is not warranted for groundwater to be protective of aquatic receptors.

4.1.6 HRA Summary

Under the assumptions and conditions presented in the HRA, COPCs in soil may pose a theoretical risk and noncancer hazard to a future worker and resident if the Site conditions were not remediated or mitigated. The risk driving chemicals of concern (COCs) in soil are arsenic, lead, and TPH-d in soil. Within areas of the Site excluding Zone 4, the risk-driving COCs are arsenic and lead for a future worker and construction worker; for a future resident, the risk-driving COCs are arsenic, lead, and TPH-d. Within Zone 4, the risk-driving COCs are lead and TPH-d for both a future worker and a future resident. Arsenic, lead, and TPH-d are risk-driving COCs for a future construction worker. Within the area of the VOC plume, PCE is the primary risk-driving COC with contributions from cis-1,2-DCE, TCE, and vinyl chloride for a future worker and resident. PCE, cis-1,2-DCE, and TCE are the risk driving COCs for a future construction worker. Action to remediate or mitigate potential exposure to these risk-driving COCs in soil is appropriate.

The risk-driving COCs in Fill zone groundwater for vapor intrusion potential are vinyl chloride for a future worker and benzene and vinyl chloride for a future resident. Within the area of the CVOC plume, PCE and vinyl chloride are the primary risk-driving COCs in groundwater based on the potential for vapor intrusion with contributions from cis-1,2-DCE, ethylbenzene, trans-1,2-DCE, TCE, and vinyl chloride. Further action to assess the potential for vapor intrusion from groundwater for these volatile VOCs appears warranted. For VOCs in Fill groundwater potentially migrating into construction trenches, no mitigation measures or engineering controls are warranted. However, within the area of the chlorinated VOC plume, cis-1,2-DCE, PCE, TCE, and vinyl chloride are the risk-driving COCs based on the potential for migration into a construction trench and confirmation sampling and/or air monitoring will be conducted in advance of any in-trench construction work.

4.2 Media-Specific Cleanup Levels

In the absence of any remediation or mitigation efforts, the primary risk-driving COCs identified in the HRA and summarized in Section 4.1; risk-driving COCs at the OU-2 are:

- Soil:
  - Arsenic, lead, and TPH-d in soil in Zones 1, 2, 3, 5, and 6;
  - Lead and TPH-d in soil within Zone 4;
  - PCE, TCE, cis-1,2-DCE, and vinyl chloride in soil within the CVOC Area;
- Soil vapor (based on groundwater evaluation): benzene and vinyl chloride sitewide, and PCE, TCE, cis-1,2-DCE, and vinyl chloride in the CVOC Area; and
- Groundwater (vapor intrusion pathway only): benzene and vinyl chloride sitewide, and PCE, TCE, cis-1,2-DCE, and vinyl chloride in CVOC Area groundwater.

The potential exposure pathways to these risk-driving COCs in soil are direct exposures (incidental ingestion, dermal contact, and inhalation of particulates in ambient air) and potential inhalation of VOCs in indoor air migrating from soil and shallow groundwater. Due to the presence of VOCs in soil and shallow groundwater, it is appropriate that soil vapor and groundwater CULs for vapor intrusion be developed for implementation of the remedy and assessment of the need for vapor mitigation engineering controls during development.

The CULs described in the following sections are based on regional background concentrations for naturally-occurring COCs, a maximum hazard index of 1.0 for non-carcinogenic constituents, and an excess cancer risk of 1×10^{-6} for residential Site users and commercial Site users.

4.2.1 Soil

The CULs for arsenic, lead, and TPH-d in soil were developed based on background concentrations and residential exposure. As documented in the HRA (**Appendix D**), impacts to groundwater derived from Site soils do not present an unacceptable risk to aquatic receptors; therefore, soil CULs for groundwater protection are not necessary.

The following are CULs for risk-driving COCs in uncapped soil at the Site:

COCs	Residential (mg/kg)	Commercial/Industrial (mg/kg)
Arsenic	19.1	19.1
Lead	80	320
TPH-d	260	1,200
Tetrachloroethene	0.59	2.7
cis-1,2-Dichloroethene	19	85
Trichloroethene	0.95	6.1
Vinyl chloride	0.0083	0.15

The arsenic CUL is a value developed by LBNL that has been accepted as a background concentration for arsenic in the San Francisco Bay Area and is applicable to the Site. In particular, the LBNL background concentration for arsenic was approved for the Schlage OU and UPC OU-SF, which are located immediately north of the San Francisco County Line [DTSC, 2009b]. The portion of the bay comprising the Schlage OU and the former railyard (i.e., UPC OU-SF and UPC OU-SM) were in-filled around the same time and likely with similarly sourced fill materials [B&M and T&R, 2002]. Therefore, the background concentration at Schlage OU and UPC OU-SF is also appropriate for the OU-2.

The lead CULs (i.e., 80 and 320 mg/kg for residential and commercial/industrial use, respectively) are the Office of Environmental Health Hazard Assessment (OEHHA) recommended screening levels for residential and commercial/industrial land use [OEHHA, 2009] based on noncancer endpoints. The CULs for TPH-d, PCE, cis-1,2-DCE, TCE, and vinyl chloride are RWQCB ESLs [RWQCB, 2019a]; TPH-d and cis-1,2-DCE are based on noncancer endpoints and PCE, TCE, and vinyl chloride are based on cancer endpoints.

4.2.2 Groundwater

Fill zone groundwater at the Site is not used for domestic or industrial purposes and as discussed in Section 2.5, Fill zone groundwater meets exceptions to State Water Resources Control Board Resolution No. 88-63 and is not likely to be used as a potential drinking water source. The HRA evaluated exposure by saltwater aquatic receptors to metals. The results of the HRA indicated that chemicals in shallow groundwater are not expected to pose a risk to aquatic receptors. Because there is no drinking water risk to human receptors or exposure risk to ecological receptors from COCs in the fill zone groundwater, CULs for groundwater are not proposed.

However, VOCs in Fill zone groundwater may pose a vapor intrusion risk at the Site. RWQCB ESLs for vapor intrusion are proposed as preliminary groundwater CULs [RWQCB, 2019a]:

COC	Residential	Commercial/ Industrial
	µg/L	
Benzene	0.42	1.8
cis-1,2-Dichloroethene[1]	49	210
Tetrachloroethene	0.64	2.8
Trichloroethene	1.2	7.5
Vinyl chloride[2]	0.0086	0.14

1. Based on non-cancer endpoint; all others are based on cancer endpoint.
2. The analytical reporting limit for vinyl chloride, 0.5 µg/L, presents a practical limitation on the evaluation of groundwater cleanup.

Groundwater CULs for protection of the vapor intrusion pathway are applicable to conditions where an occupied building will be constructed over an area where volatile COCs are present in groundwater. If a volatile COC in groundwater exceeds its groundwater CUL, the soil vapor intrusion pathway will be considered as described in Section 4.2.3. If a vapor intrusion risk is identified either a groundwater remedy, soil vapor mitigation, or a combination of both will be considered.

4.2.3 Soil Vapor

The potential risk posed by volatile COCs in soil vapor to future Site users is most appropriately evaluated after development plans have been approved, horizontal development has been completed (mass grading and installation of subgrade utilities), and prior to vertical construction.

Current indoor air and soil vapor screening levels are as follows [RWQCB, 2019a]:

COC	Indoor Air		Soil Vapor	
	Residential	Commercial/ Industrial	Residential	Commercial/ Industrial
	micrograms per cubic meter			
Benzene	0.097	0.42	3.2	14
Benzene (with bioattenuation)[1]	0.097	0.42	3,200	14,000
cis-1,2-Dichloroethene	8.3	35	277	1,167
Tetrachloroethene	0.46	2.0	15	67
Trichloroethene	0.48	3.0	16	100
Vinyl chloride	0.0095	0.16	0.32	5.2

1. Additional default attenuation factor equal to 0.001 for bioattenuation of petroleum hydrocarbons (i.e., petroleum soil vapor ESL x 1,000) [RWQCB, 2019c]. The Site-specific attenuation factor will be determined during the soil vapor intrusion evaluation.

Soil vapor samples will be collected following Site regrading and soil cap placement, and prior to the commencement of vertical building construction in applicable locations to re-evaluate the potential vapor intrusion risk under the then-current Site conditions. The soil vapor data will be compared to the above screening levels as well as updated screening level guidance that is in effect at the time the data are collected. An exceedance of one or more of then applicable soil vapor screening levels will trigger the development of risk-based Site-specific CULs or design of a localized soil vapor mitigation system for the vapor intrusion pathway. The development of Site-specific CULs will consider localized building specifications, planned building uses, and localized attenuation rates for COCs in soil vapor within unsaturated Fill zone soil. The Site-specific CULs will represent an excess cancer risk that is equal to or below 1×10^{-6} for residential and commercial Site users in occupied spaces.

The soil vapor screening levels tabulated above are based on an attenuation factor, or ratio of indoor air concentration to soil vapor concentration, of 0.03 for both residential and commercial buildings. Because the proposed development includes construction of all new buildings, attenuation factors of 0.001 for residential buildings and 0.0005 for commercial buildings may be appropriate [DTSC, 2011] based on Site-specific conditions that may include, but are not limited to, the following:

- Potential source of CVOCs in soil vapor at the Site is groundwater and soil that has been contaminated by historical activities on Industrial Way. As discussed in Section 7, in-situ groundwater treatment using biological and/or chemical injection technologies is the preferred groundwater remedial action. The effectiveness of the groundwater remedy will be monitored and contingency measures will be implemented as necessary until the groundwater remedial goals have been achieved.

- Newly constructed buildings will have robust floors. The slabs will be high-density concrete, 8 to 10 inches in thickness, and utility penetrations will be sealed. The concrete will be cured in a manner to eliminate joints and minimize the potential for vapor intrusion. In addition, buildings will be equipped with modern heating, ventilation, and air conditioning (HVAC) systems that will be programmed to maintain a positive interior pressure to prevent the intrusion of soil vapor into the pressurized building air space.
- In most areas of the Site, building slabs will be underlain with engineered fill that is five feet or more in thickness. The fill will be placed to adjust the existing ground surface elevation to the future base grade of the development. The engineered fill will act as a buffer zone that will create distance between the CVOC source (i.e., groundwater) and receptors in the overlying buildings.
- Some buildings will incorporate an "intrinsically safe" building design whereby the ground floor will consist of ventilated parking garages or commercial retail and amenity spaces. The ventilated garage space acts as a buffer to more rapidly attenuate vapors that could potentially migrate into garage air space before entering commercial and residential space. The ground floor commercial space provides a buffer for overlying residential space and provides greater attenuation of CVOCs migrating through the commercial space. Such intrinsically safe design provides for a more effective attenuation of infiltrating vapors.

At locations where buildings will be constructed above CVOCs in groundwater, a location specific evaluation will be conducted. The evaluation may include additional localized groundwater sampling, soil vapor sampling, and building condition assessment. The resulting data will inform a building-specific vapor intrusion evaluation and design of appropriate mitigation systems, if warranted. Details of the location specific evaluation will be presented in the Remedial Design documents.

4.3 Application of Cleanup Levels

The typical concept of human exposure at a site or within a defined exposure area is an individual's contact with contaminated media on a periodic and random basis. Because of the repeated nature of such contact, human exposure does not really occur at a fixed point but rather at a variety of points with equal likelihood that any given point within the exposure area will be the contact location on any given day.

The USEPA recommends that the arithmetic average of chemical concentrations, or exposure point concentrations (EPCs), within an exposure area be calculated for comparison to Site CULs [USEPA, 1989b]. To evaluate possible exposure to multiple chemicals, the effects of multiple chemicals within an exposure area are assumed to be additive. The USEPA further recommends that a UCL be used to represent the EPC to account for variability in the data set and uncertainty in estimating an arithmetic mean. As additional sampling is conducted, EPCs for the risk-driving COCs in each media of concern will be recalculated using USEPA's ProUCL Version 5.1. The resulting EPCs will then be compared to the CULs proposed above and the ratios between the EPCs and CULs will be estimated to demonstrate that any remaining chlorinated VOC chemical or combination of chemicals is not likely to pose substantial health risks, and to help determine whether or not further action (i.e., mitigation or remediation) may be necessary.

CULs will be used to determine where at the Site mitigation or remediation is necessary, or to identify areas for additional characterization. Where COC concentrations in soil, soil vapor, or groundwater exceed CULs, mitigation or remediation will be implemented to reduce exposure risks to acceptable levels.

5. REMEDIAL ACTION OBJECTIVES

5.1 Site Remedial Action Objectives

RAOs are site-specific, quantitative goals that define the extent of cleanup required to achieve the appropriate level of protectiveness for human health (i.e., residential and commercial Site users and construction workers) and the environment. The RAOs for the Site include:

- Soil – Prevent exposure to soil with COCs at concentrations exceeding CULs by eliminating the exposure pathway for future receptors, which include incidental ingestion, inhalation of windblown dust particles, and dermal contact.
- Soil vapor – Prevent exposure to VOCs in soil vapor at concentrations that exceed applicable CULs for soil vapor by blocking or minimizing the vapor intrusion pathway;
- Groundwater – Prevent exposure to VOCs in groundwater by eliminating inhalation risks through the vapor intrusion pathway and preventing ingestion and dermal contact through preventing the use of groundwater for potable and agricultural purposes.

5.2 Applicable or Relevant and Appropriate Requirements

Section 121(d) of CERCLA, 42 U.S.C. § 9621(d), requires remedial actions to attain or justify the waiver of applicable, or relevant and appropriate, federal and state environmental or state facility siting requirements. These applicable, or relevant and appropriate requirements are referred to as "ARARs." Federal ARARs may include requirements promulgated under any federal environmental laws. State ARARs may only include promulgated, enforceable environmental or facility-siting laws of general application that are more stringent or broader in scope than federal ARARs and that are identified by the state in a timely manner.

Applicable requirements are those cleanup standards, standards of control, criteria, or limitations that specifically address conditions, circumstances, or activities at a site. Relevant and appropriate requirements are those cleanup standards, standards of control, criteria, or limitations that, while not directly "applicable" to conditions, circumstances, or activities at the site, address problems or situations sufficiently similar to those encountered at the site so that their use is well suited to the site. A requirement that is not directly applicable must be both relevant and appropriate based on site-specific factors to be an ARAR. The criteria for determining relevance and appropriateness are listed in the NCP, 40 CFR § 300.400(g)(2).

Non-promulgated advisories or guidance issued by federal or state government are not legally binding and do not have the status of potential ARARs. Such advisories or guidance, which are termed "To-Be-Considered" material, are used during the cleanup process to further the goal of protecting human health and the environment.

ARARs only include substantive, not administrative, requirements, and pertain only to onsite matters. Any offsite activities must comply with all applicable federal, state, and local laws, including both substantive and administrative requirements.

ARARs are identified on a site-specific basis from information about the chemicals at the site, the actions that may take place at the site, and the features of the site location. There are three general ARAR categories:

- Chemical-specific;
- Action-specific; and
- Location-specific.

Chemical-specific ARARs are numerical values or methodologies that, when applied to site-specific conditions, result in the establishment of numerical values for specific chemicals. They are used to determine acceptable concentrations of specific hazardous substances, pollutants, and contaminants in the environment. If a chemical is subject to more than one numerical value or methodology, the most stringent is generally selected.

Location-specific ARARs are restrictions placed on the concentration of hazardous substances, pollutants, or contaminants or the conduct of activities solely because they are in specific locations, such as wetlands or floodplains.

Action-specific ARARs are technology- or activity-based requirements or limitations on actions taken with respect to hazardous substances, pollutants, or contaminants.

The analysis and identification of chemical-specific, location-specific, and action-specific ARARs for the selected remedies for the Site follow USEPA guidance, including CERCLA Compliance with Other Laws Manual (Interim Final), USEPA Office of Solid Waste and Emergency Response (OSWER) Directive 9234.1-01, August 1988 [USEPA, 1988], and the CERCLA Compliance with Other Laws Manual: Part II, Clean Air Act and Other Environmental Statutes and State Requirements (Interim Final), OSWER Directive 9234.1-02, August 1989 [USEPA, 1989a].

Table 10 presents the following information: (1) a list of all potential ARARs and To-be-Considered Requirement (TBCs) that have been identified for the Site; (2) the legal citation(s) for each ARAR and TBC; (3) determination as to whether each citation is an ARAR or TBC; and (4) a brief description of each ARAR and TBC.

The list of potential ARARs in **Table 10** includes Toxic Substances Control Act (TSCA) requirements for PCBs. Fill soil sampling results include three sample locations with PCB concentrations exceeding 1 mg/kg, which potentially triggers TSCA regulations for managing remediation waste (40 CFR Part 761). TSCA provides standards for the manufacture, processing, distribution in commerce, use, disposal, and marking of PCBs and PCB items. TSCA regulates the management and disposal of PCB contaminated soil from a spill or release as PCB remediation waste. PCB remediation waste does not include materials disposed of prior to 1978 that currently have a PCB concentration less than 50 parts per million (or 50 mg/kg in soil). The isolated PCB detections found at the Site could be associated with pre-1935 fill operations. However, TSCA disposal requirements apply to the disposal of PCB-contaminated soil. Offsite disposal of PCB-contaminated soil will comply with applicable federal and state requirements, including TSCA and the Resource Conservation and Recovery Act (RCRA).

6. FEASIBILITY STUDY AND ALTERNATIVES ANALYSIS

This section presents: (1) the remedial technology screening matrix based on contaminated media, risk-based cleanup levels, and rough development grading requirements; (2) the criteria used to develop and evaluate remedial technologies; (3) the development of remedial action alternatives based on the screening and evaluation; and (4) assessment of remedial alternatives developed for OU-2 and rationale for selection of the preferred remedial approach.

6.1 Remedial Technology Screening

This section outlines the range of general response actions to address contamination at the Site and corresponding remedial technologies that are potentially applicable for the contaminated soil, soil vapor, and groundwater at the Site.

6.1.1 General Response Actions

A range of general response actions (GRAs), for which corresponding remedial technologies may be applicable to Site conditions, was identified for OU-2 for initial baseline evaluation and comparison purposes under RAP Guidance in Section 6.1.2. The GRAs considered for the Site include: no action, institutional controls, engineering controls, containment, ex situ treatment, in situ treatment, and excavation/disposal. Remedial technologies that correspond to the GRAs were then evaluated and compared based on three criteria: (1) effectiveness; (2) implementability; and (3) relative costs.

To refine the range of remedial technologies that would potentially be developed into remedial alternatives for the Site that must undergo detailed analysis, the NCP at 40 CFR §300.430(e)(7) provides the opportunity to initially screen them against the short- and long-term aspects of the following three criteria:

- Effectiveness: Alternatives are judged on the degree to which an alternative reduces toxicity, mobility, or volume through treatment, minimizes residual risks and affords long-term protection, complies with ARARs, and minimizes short-term impacts, and how quickly it achieves protection. Alternatives providing significantly less effectiveness than other, more promising alternatives may be eliminated. Alternatives that do not provide adequate protection of human health and the environment shall be eliminated from further consideration.
- Implementability: This criterion focuses on the technical feasibility and availability of the technologies each alternative would employ, and the administrative feasibility of implementing the alternative. Alternatives that are technically or administratively infeasible, or require equipment, specialists, or facilities that are not available within a reasonable period of time may be eliminated from further consideration.
- Cost: Costs of construction and any long-term costs to operate and maintain the alternatives shall be considered. Costs that are grossly excessive compared to the overall effectiveness of alternatives may be used as a factor to exclude alternatives from further consideration. Alternatives providing effectiveness and implementability

comparable to that of another alternative by employing a similar method of treatment or engineering control, but at greater cost, may also be eliminated.

6.1.2 Remedial Technology Screening

This section describes the screening and selection of the range of remedial technologies that are potentially applicable for the contaminated soil, soil vapor, and groundwater at the Site. The Remedial Technology Screening Matrix presented in **Table 11** was used to guide whether a technology should be retained for further consideration based on the nature and extent of the current levels of contamination at the Site.

Land use restrictions (administrative/institutional mechanisms) would be included as components of the remedial action alternatives developed based on the remedial technology screening. These controls may be applicable both within the short term (e.g., to prevent reuse of groundwater or select vapor intrusion mitigation measures where there is significant risk or other controls until applicable CULs are achieved), and in the long term to: (1) maintain the reuses consistent with the risk exposures assumed in the development of CULs (or Site-specific CULs) for the preferred remedial actions; and (2) prevent unrestricted reuses of areas where residual contamination may remain.

The following technologies retained from the screening were then incorporated in the development of remedial action alternatives described in Section 6.2:

- Institutional Controls (administrative/institutional mechanisms) for Soil, Soil Vapor, and Groundwater – Restrictions limiting Site uses, such as limitations on use of groundwater without prior RWQCB approval, and adoption of land use restrictions (e.g., administrative controls and/or engineering controls) to ensure, for example, that occupied structures are protective of future site users and that engineering controls are monitored and maintained for the long-term protection of future site uses;
- Capping (containment) for Soils – Capping of existing Site soil using hardscape materials or a specified thickness of clean soil to ensure the protection of future Site users by eliminating direct contact exposure pathways to impacted soil;
- Excavation for Soils – Where development requires excavation or existing soil cannot be capped, excavation of soil exceeding CULs and offsite disposal, onsite ex situ treatment (see below) and/or excavation and relocation beneath a cap to eliminate direct contact exposure pathways and, in the case of offsite disposal, to reduce the amount of contaminant mass at the Site;
- Onsite Ex Situ Treatment for Soils – Ex situ smoldering to treat soils impacted with potentially mobile petroleum hydrocarbons, allowing for onsite reuse of treated soil;
- In Situ Treatment for Groundwater – Biological and/or chemical treatment to reduce the mass of residual CVOCs in groundwater with groundwater monitoring to evaluate effectiveness; and

- Monitored Natural Attenuation for Groundwater – Continued monitoring of the natural attenuation of VOCs in groundwater by sorption, dilution, biological transformation, and chemical reaction.

6.2 Remedial Alternatives Development and Evaluation

6.2.1 Description of Evaluation Criteria

The above technologies were assembled into four remedial alternatives which were subjected to: (1) a detailed alternative analysis pursuant to the nine criteria of the NCP and the six criteria of Section 25356.1 of the California HSC; and (2) comparative analysis identifying the advantages and disadvantages of each alternative when compared to other alternatives considered for the Site.

The nine NCP criteria include two threshold, five balancing, and two modifying criteria. For a remedial alternative to be considered an appropriate remedial action, it must meet both threshold criteria.

Balancing criteria provide an opportunity to identify and evaluate strengths, weaknesses, and the cost-effectiveness of an alternative. Modifying criteria are evaluated after the public comment period.

This section introduces these criteria. Summaries of the comparative evaluations of alternatives for the remedial action areas included in this FS/RAP are presented in Section 6.4.

The California HSC requires that the remedial alternatives be evaluated relative to the following six additional criteria:

1. Health and safety risks posed by the Site conditions;
2. The effect of COCs present on probable present and future uses of contaminated or threatened resources;
3. The effect on available groundwater resources for present, future, and probable beneficial uses (treatment alternatives that reduce the volume, toxicity, and mobility of contaminants as opposed to alternatives that use offsite transport and disposal are preferred);
4. Site-specific conditions (potential for offsite migration) and existing contaminant background levels;
5. Cost-effectiveness, considering the short-term and long-term costs of the remedial action and whether deferral of a remedial action could result in a cost increase or hazard increase to human health or the environment; and
6. The potential environmental impacts of the remedial alternative such as land disposal of contaminated material versus treatment to remove or reduce its volume, toxicity, or mobility prior to disposal.

The six California HSC criteria are similar to and covered under the nine NCP criteria in this FS/RAP described below.

Threshold Criteria

Overall Protection of Human Health and the Environment – Addresses whether a remedy provides adequate protection and describes how risks posed through each exposure pathway are eliminated, reduced, or controlled through treatment, engineering controls, or land use restrictions (i.e., administrative/institutional controls).

Compliance with ARARs – Addresses whether a remedy will meet all appropriate federal, state, and local environmental laws and regulations.

Balancing Criteria

Long-Term Effectiveness and Permanence – Considers the ability of a remedy to provide reliable protection of human health and the environment over time once cleanup goals have been achieved.

Reduction of Toxicity, Mobility, and Volume Through Treatment – Evaluates the anticipated performance of the alternative with respect to the reduction of toxicity, mobility, and volume of contaminants. This criterion reflects the preference for treatment of contaminated soil and groundwater as opposed to offsite transport and disposal.

Short-term Effectiveness – Evaluates the period of time needed to complete the remedy, and any adverse impact on human health and the environment that may be posed during the construction and implementation period, until cleanup standards are achieved. Potential impacts during construction include construction worker exposure to Site COCs, offsite dust migration, offsite stormwater and sediment migration, air pollution, and noise.

Implementability – Refers to the technical and administrative feasibility of a remedy, including the availability of materials and services needed to implement a remedial option.

Cost – Evaluates the capital and O&M costs of each alternative for 30 years. Cost estimates of this type are considered accurate to a range of minus 30% to plus 50%. The reasons for this range are the variability of construction materials, variability in construction costs over time, the complexity of developing Site-specific cost factors, and the sensitivity of construction costs to economic factors such as interest rates and materials costs. All remediation costs are the responsibility of the Site owner or building owners.

Modifying Criteria

These criteria were addressed during the public review and comment period on this FS/RAP. Comments and responses are summarized in the Responsiveness Summary (**Appendix H**).

Regulatory Agency Acceptance – Indicates whether, based on their review of the information, the applicable regulatory agencies would agree with the preferred alternative.

Community Acceptance – The FS/RAP was subject to public review and comment prior to selection of the remedial action alternative. This criterion assesses whether community concerns are addressed by the remedy, and whether the community prefers a remedy. The final remedies in this FS/RAP were selected following the public comment period, which occurred from 28 October to 18 December 2020.

6.3 Description of Remedial Action Alternatives

This section describes the remedial action alternatives that were developed based on assembly of the following applicable remedial technologies that passed the initial screening:

Land Use Restrictions

-- Land Use Covenant documenting the following prohibitions and requirements:

- No occupied buildings, including sensitive uses, where COC concentrations in soil vapor exceed CULs without RWQCB approval based on either (1) a risk assessment demonstrating Site soil vapor conditions pose no significant risk to human health based on a site-specific assessment; or (2) engineering controls, such as building design or vapor intrusion mitigation systems, that will reduce the risk of vapor intrusion to a protective level;
- No growing produce or vegetables for human consumption in native soil. Plants for human consumption may be grown if they are planted in raised beds (above the approved cover) containing non-native soil. Trees producing edible fruit (including trees producing edible nuts) may also be planted provided they are grown in containers with a bottom that prevents the roots from penetrating the native soil;
- No extraction or use of underlying groundwater is allowed without a Groundwater Management Plan pre-approved by RWQCB;
- No drilling for any water, oil, or gas, or extraction or removal of groundwater without a RWQCB-approved Groundwater Management Plan and prior written approval by RWQCB;
- No interference with, or modification of, a vapor mitigation system shall be permitted without prior written approval by RWQCB, and future tenants must provide reasonable access for O&M of vapor mitigation systems;
- All excavation into the cap shall comply with the RWQCB-approved Soil Management Plan (SMP);
- Contaminated soils brought to the surface by grading, excavation, trenching or backfilling shall be managed in accordance with all applicable provisions of state and federal law and a pre-approved RWQCB SMP;
- All uses and development of the Site shall preserve the integrity and effectiveness of the cap; and
- O&M Plan to maintain capped surfaces and operate vapor intrusion mitigation systems, if applicable.

Engineering Controls

-- Vapor intrusion mitigation systems or intrinsically safe building design for mitigating vapor intrusion into indoor air by VOCs in soil vapor;
-- Sub-slab venting.

Capping

-- Soil cover meeting soil import criteria for the Site with a minimum 5-foot thickness and an underlying demarcation layer; or
-- Hardscape consisting of concrete, asphalt, masonry, or other durable, impervious surface; and
-- Building foundations.

Excavation

-- Where capping in place is not possible, soil exceeding CULs will be excavated to a depth of 5 feet, relocated onsite, and capped with a soil cover, hardscape, or building foundation;
-- Onsite treatment to satisfaction of soil import criteria and placement onsite;
-- Offsite disposal of excavated soil at a licensed and approved waste management facility.

Onsite Ex Situ Soil Treatment

-- Thermal/Smoldering to treat TPH in soil.

In Situ Groundwater Treatment

-- Biological and/or chemical treatment of CVOCs.

Monitored Natural Attenuation
-- Groundwater monitoring to ensure COC concentrations decrease to CULs over time by natural processes including biodegradation, dispersion, and adsorption to soil.

The following Site-wide remedial action alternatives were developed based on the screening of remedial technologies presented in Section 6.1.2 and summarized in **Table 11**:

- Alternative 1: No Action;
- Alternative 2: Land Use Restrictions / Engineering Controls for Vapor Intrusion Mitigation / Monitored Natural Attenuation;
- Alternative 3: Land Use Restrictions / Engineering Controls for Vapor Intrusion Mitigation / Soil Capping / Excavation with Relocation and Containment / Excavation with Offsite Disposal / In Situ Groundwater Treatment and Monitoring; and
- Alternative 4: Land Use Restrictions / Engineering Controls for Vapor Intrusion Mitigation / Complete Excavation with Offsite Disposal and Restoration to Original Grade / In Situ Groundwater Treatment and Monitoring.

The alternatives are described below and comparatively evaluated in Section 6.4 based on the criteria presented in Section 6.2.

6.3.1 Alternative 1 — No Action

No additional control or protection of human health and the environment would be implemented for the contamination present at the Site. This alternative is required as a baseline alternative for comparison to other alternatives under RAP Guidance. There is negligible cost associated with administrative activities for this alternative.

6.3.2 Alternative 2 — Land Use Restrictions / Engineering Controls for Vapor Intrusion Mitigation / Monitored Natural Attenuation

This alternative assumes no active remediation would be implemented and risk exposures at the Site would be managed through land use and activity restrictions and engineering controls, which are described as follows:

Land Use Restrictions: Land use restrictions would be imposed to restrict certain land uses and activities and to require implementation and maintenance of engineering controls. The land use restrictions would prohibit the extraction or use of Fill groundwater for domestic and agricultural purposes without prior approval of the RWQCB. The land use restrictions would also require preparation and implementation of a Soil Management Plan approved by the RWQCB prior to excavation of soil. In areas where VOCs in soil vapor exceed CULs, vapor barriers and/or sub-slab venting systems would be incorporated into the designs of the buildings.

Engineering Controls: Engineering controls would be implemented to control dust emissions and stormwater runoff during construction and to mitigate intrusion of VOC vapors from the groundwater and soil into occupied buildings where needed. For costing purposes, monitoring of

engineering controls to verify the vapor intrusion risk has been mitigated would be conducted for 30 years following construction.

Monitored Natural Attenuation: A groundwater monitoring program would be implemented to verify that natural attenuation of VOCs is occurring and concentrations of COCs in groundwater are decreasing over time.

A deed restriction would be recorded on the title to the property to document that Land Use Restrictions and engineering controls must remain in place to prevent human exposures to contaminants left in place in soil and groundwater above levels considered protective of unrestricted use of the Site, as described in Section 7.8.

The total estimated cost of this alternative is approximately $8.1 million, which includes capital costs of $1.2 million and O&M costs of $6.9 million over 30 years (**Appendix E**).

6.3.3 Alternative 3 — Land Use Restrictions / Engineering Controls for Vapor Intrusion Mitigation / Soil Capping / Excavation with Relocation and/or Offsite Disposal / In Situ Groundwater Treatment and Monitoring / Optional Ex Situ Soil Treatment

This alternative consists of the land use restrictions, engineering controls, and groundwater monitoring as described in Alternative 2 and, additionally, includes soil capping, excavation with relocation or offsite disposal, groundwater treatment, and a contingency for treating soil onsite. These additional elements are shown in **Figure 18** and summarized below:

Soil Capping: All exposed soil with residual COC concentrations above CULs at the Site would be capped with a minimum of 5 feet of imported clean fill (i.e., approximately 1,240,000 bulk cubic yards) or other hardscape material. Although not all soil exceeds CULs for unrestricted use, this alternative proposes to cap the entire Site. As described in the project description (Section 1.4), a significant amount of soil will be imported to the Site and placed as fill to raise the grade a minimum of 5 feet as part of site mitigation. In places, the ground elevation will be raised substantially as part of Site development. To meet the remedial action objectives of this Alternative 3 (i.e., to ensure the protection of future Site users by breaking the direct exposure pathway to impacted soil), the surface shall be capped with either hardscape material or the uppermost 5 feet of fill soil shall be composed of clean, imported soil. Soil imported as fill will meet the import criteria provided in **Appendix F**. Import soil criteria for capping purposes are consistent with, and in the case of arsenic more conservative than, the residential soil CULs in Section 4.2.1. A demarcation layer would be placed beneath the 5-foot thick soil cap to demarcate the transition between the clean soil cap and the underlying soil. A conceptual cross-section depicting the development is provided as **Figure 19**.

Soil in the western portion of the Site adjacent to Bayshore Boulevard with COCs that exceed health risk criteria will either be capped by hardscape (e.g., building foundations, paved areas) or excavated for onsite relocation beneath a clean soil cap or hardscape, offsite disposal, or onsite treatment and reuse or disposal. The excavations would be backfilled with clean soil so the thickness of clean soil is at least 5 feet over any residual soil with COC concentrations exceeding CULs.

Soil imported from offsite sources will be managed in accordance with a soil import plan to verify that it meets the soil use criteria for capping or other fill purposes. The soil import plan will be incorporated into a future RDIP.

Excavation with Relocation and Capping or Off-haul: Soil with COC concentrations exceeding CULs will be excavated and relocated onsite, treated, or transported offsite for disposal if capping is not appropriate or if capping is not possible due to the grading plan. For example, capping of soils within the CVOC-impacted area in Investigation Zones 4 and 6 would not address the vapor intrusion risk posed by the elevated concentrations of CVOCs in soil, so it is anticipated that this area will be excavated and disposed offsite unless treated. Based on available data, the excavation footprint within the CVOC-impacted area would be approximately 90 feet by 90 feet with a depth of 10 feet (i.e., approximately 3,000 bank cubic yards and assuming a 1.2 bulking factor). Other soil that may be excavated and disposed offsite includes PCB-contaminated soil, soil that is geotechnically unsuitable to support building foundations, or soil that exhibits strong visual and olfactory characteristics that are not desirable for the future development. For costing purposes, it was estimated that 10,000 bank cubic yards (i.e., 12,000 bulk cubic yards assuming a bulking factor of 1.2) of excavated soil would be transported offsite for disposal, with 80% (i.e., 9,600 bulk cubic yards) disposed as non-hazardous waste at the Class II facility in Altamont, California, and 20% (i.e., 2,400 bulk cubic yards) disposed as non-RCRA hazardous waste at the Class I facility in Buttonwillow, California. Other permitted disposal facilities may be used if appropriate. The off-haul volume of 12,000 bulk cubic yards corresponds to 1,000 truckloads of 12 cubic yards per load. Assuming an off-haul rate of 21 loads per day, off-haul would occur over approximately 48 days. Excavation and relocation/off-haul details will be specified in the RDIP.

Other impacted soil that could not be capped in place may be excavated and managed onsite, such as the area of the Site adjacent to Bayshore Boulevard where the Site grade cannot be abruptly raised by 5 feet or more. The Site boundary along Bayshore Boulevard is approximately 4,000 feet long. Assuming an average 10% incline, the ground surface elevation will rise by 5 feet at a distance of 50 feet east of Bayshore Boulevard. Within this 4,000 feet by 50 feet area, any existing soil with COCs that exceed the CULs and that will not be covered by hardscape will need to be excavated and backfilled. Assuming half of the area will be covered by hardscape and the other half will be excavated and backfilled, the area subject to excavation would be approximately 100,000 square feet. Further assuming a linear incline from 0 feet to 5 feet, the average thickness of clean fill within the excavation area would be 2.5 feet. Thus, to create a 5-foot-thick column of clean soil atop existing Site soil, the average excavation depth in this area would be 2.5 feet (i.e., the excavation depth is 0 feet where the thickness of clean fill is 5 feet, and the excavation depth is 5 feet where the thickness of clean fill is 0 feet). An excavation with area 100,000 square feet and thickness 2.5 feet has a volume of 250,000 cubic feet, or approximately 9,300 bank cubic yards.

For costing purposes, it was assumed that 10,000 bank cubic yards (12,000 bulk cubic yards) of excavated soil would be relocated onsite and appropriately capped with a clean soil cover, hardscape, or a building foundation. Details of excavation and relocation will be specified in a soil excavation and relocation RDIP.

Groundwater Treatment: Groundwater within the proposed treatment zone identified in **Figure 18** would be treated in situ using biological and/or chemical technologies (i.e., enhanced

biological reduction, in situ chemical oxidation, and/or in situ chemical reduction). It is assumed that there will be two rounds of in situ treatment and that the cost for the second round will be approximately half the cost of the first round. Long term groundwater monitoring would also be performed to verify the effectiveness of the remedy. Details of the groundwater remedy and monitoring will be provided in the RDIP.

Soil Treatment (Optional): The Revised RAP [B&M, 2002a] concluded that weathered Bunker C oil is effectively immobile in soil at typical Site temperatures. However, the potential for mobilization of weathered Bunker C oil in the Fill zone under the loads anticipated for soil capping and development cannot be evaluated in the absence of a specific site development plan. A pre-design petroleum mobility evaluation will be conducted to determine whether consolidation of the Fill zone will mobilize weathered Bunker C oil. A pre-design work plan will be provided to the RWQCB in advance of the evaluation and the results will be included in one or more RDIPs. If capping and site development is not appropriate, then as a contingency for limited application, onsite ex situ treatment of TPH-impacted soils using a thermal/smoldering technology may be implemented for treating soil containing potentially mobile Bunker C oil. For costing purposes, it was estimated that 12,000 bulk cubic yards of soil will be excavated, treated, and reused onsite.

The total estimated cost of this alternative without soil treatment is approximately $40.2 million, which includes capital costs of $33.3 million and O&M costs of $6.9 million over 30 years (**Appendix E**). If optional soil treatment is included, the cost for this alternative is $43.3 million, which includes capital costs of $36.4 million and O&M costs of $6.9 million over 30 years.

6.3.4 Alternative 4 – Land Use Restrictions, Engineering Controls for Vapor Intrusion Mitigation, Complete Excavation with Offsite Disposal and Restoration to Original Grade, and In Situ Groundwater Treatment and Monitoring

In this alternative, all soil with COC concentrations exceeding CULs would be excavated to the depth of either the top of a sample with all COC concentrations below screening levels or the maximum depth to groundwater, approximately 14 feet below ground surface. The estimated excavation depths across the Site are shown in **Figure 20**. All excavated soil would be transported offsite for disposal at a permitted waste management facility. For the cost estimate, it was assumed that 80% of the soil would be transported to the Class II facility in Altamont, California, and 20% of the soil would be transported to the Class I facility in Buttonwillow, California. Other approved disposal facilities may be used if appropriate. The off-haul volume of 694,000 bank cubic yards (833,069 bulk cubic yards, assuming a bulking factor of 1.2) corresponds to 69,400 truckloads of 12 cubic yards per load. Assuming a haul rate of 21 truckloads per day for six days per week, off-haul would occur over approximately 10.5 years. Following excavation, clean fill would be imported to the Site and placed in the excavations to bring the ground surface back to the existing grade. Imported soil would be placed and compacted to accommodate additional fill loads and building loads.

As in Alternative 3, groundwater within the proposed treatment zone identified in **Figure 18** would be treated in situ using biological and/or chemical technologies. It is assumed that there will be two rounds of in situ treatment and that the cost for the second round will be approximately half the cost of the first round. Long-term groundwater monitoring would also be performed to verify

the effectiveness of the remedy. Details of the groundwater remedy and monitoring will be provided in the RDIP.

Soil vapor sampling will be conducted after regrading and prior to commencing vertical construction. If warranted by the soil vapor sample results, vapor intrusion mitigation will be included in future building construction and applicable land use restrictions will be implemented.

The total estimated cost associated with implementation of this alternative is approximately $201.5 million which includes capital costs of $194.6 million, and O&M costs of $6.9 million over 30 years (**Appendix E**).

6.4 Summary Evaluation and Comparative Analysis of Remedial Action Alternatives

The four remedial alternatives identified in Section 6.3 were assessed using the nine NCP criteria for CERCLA sites established by USEPA [1989c] and additional California HSC criteria, as introduced in Section 6.2. A summary of the alternative evaluation and comparison is presented below.

For the evaluation of remedial alternatives, it was assumed that regrading will be completed in anticipation of redevelopment under all remedial alternatives. Regrading for redevelopment assumes soil will be imported to the Site to raise the grade according to the development plan. Thus, under all remedial alternatives, development activities will result in portions of the Site being covered with clean import soil and/or covered by hardscape. Only under remedial alternatives specifying soil capping will soil containing COCs at concentrations exceeding CULs be deliberately covered by a minimum 5-foot thick cap of clean soil and/or hardscape.

6.4.1 Threshold Criteria

Overall Protection of Human Health and the Environment, and Compliance with ARARs

Under Alternatives 1 and 2, portions of the Site would be capped with imported fill and/or covered with hardscape as part of the development grading plan, irrespective of the presence of COCs in soil. However, future Site users may come into contact with COCs in existing soil in uncapped areas. Thus, Alternatives 1 and 2 would not completely prevent exposure to Site COCs above CULs and would therefore not provide overall protection of human health and the environment nor comply with ARARs. For this reason, Alternatives 1 and 2 were not selected.

In contrast, Alternatives 3 and 4 would provide for excavation, land use restrictions, and vapor intrusion mitigation (if warranted), and Alternative 3 would provide for soil capping. In combination, the remedial technologies comprising Alternatives 3 and 4 would prevent exposures to COCs above CULs in soil, soil vapor, and groundwater. Therefore, these Alternatives would provide overall protection of human health and the environment as well as comply with ARARs, including Measure JJ (**Table 10**).

6.4.2 Balancing Criteria

Reduction of Toxicity, Mobility, and Volume Through Treatment

Alternatives 1 and 2 would not reduce the toxicity, mobility, or volume of contaminants in soil and groundwater through treatment and fail to satisfy this criterion. Although Site-specific treatment is only proposed as a contingency under Alternative 3, development activities including the placement of clean fill in a portion of the Site and construction of building foundations and roadways would reduce the mobility of contaminants in existing soil. However, for Alternatives 1 and 2, contaminant toxicity of mobility in soil or soil vapor would not be reduced in areas of the Site where neither raising the ground elevation nor construction are part of the redevelopment plan. In these areas, the risk levels identified in the HRA would be unmitigated during and following redevelopment.

In contrast, Alternatives 3 and 4 would reduce the mobility (e.g., potential wind dispersal and stormwater run-off) of COCs across the entire Site. Toxicity and volume of groundwater COCs in the CVOC Area (Zones 4 and 6) would be reduced through bioremediation. All existing Site soil would either be isolated beneath a cap of clean soil cover, or hardscape, or would be excavated and transferred to a permitted landfill. Additionally, Alternatives 3 and 4 would reduce the mobility and volume of contaminants in soil at the Site through excavation and offsite disposal. If needed, the optional treatment in Alternative 3 would further reduce the toxicity, mobility, and volume of contaminants in soil at the Site by thermal destruction of organic constituents such as TPH and VOCs. However, the toxicity of the off-hauled contaminated soil would not be reduced and would merely be transferred to a permitted landfill. The additional requirement for transport of impacted soil under Alternative 4 relative to Alternative 3 increases the risk of release due to the potential for surface street and highway-related accidents and impacts, loading and unloading activities, and potential releases from the landfill facility, should its containment become compromised. The transport of the impacted soil would also contribute to the emission of criteria air pollutants, other toxic air pollutants, and greenhouse gas emissions.

Long-Term Effectiveness and Permanence

Alternatives 1 and 2 would not effectively prevent exposures across the entire Site in the long-term, given the reasonably anticipated use of the Site, because no action would be taken to mitigate Site risks in areas where neither raising the ground elevation nor construction are part of the redevelopment plan.

Alternatives 3 and 4 would offer long-term effectiveness and permanence by addressing COCs in soil across the entire Site and in groundwater within the CVOC Area, implementing and maintaining land use restrictions, and preparing a soil management plan that would describe requirements for any potential contact with impacted soil or groundwater at the Site. Although Alternative 4 would offer long-term effectiveness for the Site, this Alternative would transfer a significant amount of contaminated soil to a landfill (i.e., approximately 69 times more than Alternative 3), where it would require management in perpetuity to prevent long-term impacts to the environment. It would also contribute to aggregate greenhouse gas loading.

Short-Term Effectiveness

Alternatives 1 and 2 would not be effective in the short term, given the reasonably anticipated use of the Site, because no action would be taken to mitigate Site risks in areas where neither raising the ground elevation nor construction are part of the redevelopment plan.

For Alternatives 3 and 4, the period of time needed to complete the remedy would be similar, though off-haul of excavated soil would be expected to take approximately 48 days for Alternative 3 and, assuming the same haul rate, approximately 10.5 years for Alternative 4. For Alternatives 3 and 4, short-term protectiveness would be provided by implementing measures to protect remedial construction workers, and through Occupational Safety and Health Administration work standards during excavation, relocation and capping, and offsite disposal.

Controls identified in pre-construction plans and implemented during construction would manage offsite dust migration and offsite storm water and sediment migration. Best practices will be implemented to minimize air pollution, and all construction activities involving heavy machinery will be conducted during typical working hours. Air pollution and noise impacts will be far greater for Alternative 4 than for Alternative 3 because of the more extensive earthwork in Alternative 4. Air pollution would be associated with heavy equipment excavating and handling soil, trucks to transport material offsite, trucks to transport soil back onsite to fill the excavation, and heavy equipment for placing and compacting fill soil back into the excavation.

The greenhouse gas emissions by excavators and loaders are roughly proportional to the quantity of soil being excavated and stockpiled. Thus, the greenhouse gases emitted during excavation and stockpiling of 833,000 bulk cubic yards of soil under Alternative 4 would be approximately 30 times greater than excavating and stockpiling 24,000 bulk cubic yards of soil under Alternative 3.

The impacts of soil transportation for Alternatives 3 and 4 were estimated using assumptions for OU-2 in the Draft Environmental Impact Report for the Brisbane Baylands [ESA, 2018]. The following emissions were calculated for Alternatives 3 and 4:

Alternative	Off-haul of Excavated Soil	Import of Backfill or Cap Soil	TOTAL
3 – Capping, limited excavation with partial onsite relocation and partial offsite disposal	299	379	678
4 – Site-wide excavation and offsite disposal, backfilling to restore grade	20,700	255	21,000
4* – Site-wide excavation and offsite disposal, backfilling, and regrading to 5 feet above current grade (same as Alternative 3)	20,700	634	21,400

Notes: Units are metric tons of greenhouse gas emissions as carbon dioxide equivalents based on emission factors provided in Appendix G of the Draft Environmental Impact Report for the Brisbane Baylands [ESA, 2018]. Transport of excavated soil to Altamont Landfill (58 miles from the Site) and Buttonwillow Landfill (260 miles from the Site) were assumed for non-hazardous and hazardous soil, respectively; imported fill was assumed to be transported from the Baylands Soil Processing facility (1.25 miles from the Site). Tabulated quantities are for remediation only and do not include soil import and regrading for development.

The greenhouse gas emissions that would be generated transporting soil are approximately 31 times higher for Alternative 4 than for Alternative 3. The soil quantities for placement and compaction are slightly greater for Alternative 3 than for Alternative 4 (i.e., 1,240,000 bulk cubic yards and 833,000 bulk cubic yards, respectively), so greenhouse gas emissions for placement and compaction would be higher for Alternative 3 by approximately 50%. The higher greenhouse gas emissions associated with excavation, stockpiling, and transportation make Alternative 4 approximately 30 to 60 times more impactful than Alternative 3.

However, the Site grade following implementation of Alternative 3 would be five feet higher than current grade across most of the Site, whereas the Site grade would be unchanged following implementation of Alternative 4. Currently, the development plan consists of raising the grade over most of the Site by at least 5 feet and up to 30 feet. Comparing emissions for Alternatives 3 and 4 for the same post-remedial Site grading (i.e., approximately 5 feet higher than current grade across most of the Site), Alternative 4 would require backfilling the excavation and importing soil to raise the Site grade 5 feet, summarized as Alternative 4* above.

Implementability

Each Alternative is readily implementable from a technical and administrative feasibility perspective. Alternative 2 would be easier to implement from a technical perspective than Alternatives 3 and 4 because it only involves administrative action for implementing the land use restrictions, construction of vapor mitigation controls during redevelopment, if warranted, and groundwater and reporting. Alternative 3 and 4 by comparison require excavation and capping of soils and remediation of groundwater using bioremediation. Alternative 4 is implementable but provides the highest overall risk and emissions to the environment due to waste hauling, offsite transfer of all excavated soil, and import and placement of fill soil. Significantly increased truck traffic would increase congestion on surface streets and highways and increase the likelihood of vehicular accidents.

Cost

Of the four remedial alternatives, Alternative 4 ($ 201.5 million) has the highest estimated cost (**Appendix E**).

6.4.3 Modifying Criteria

Regulatory Agency and Community Acceptance

Formal assessment of regulatory agency and community acceptance was considered during the public comment period on this FS/RAP from 28 October to 18 December 2020. Comments from the public and responses are documented in the Responsiveness Summary provided as **Appendix H**.

6.4.4 Additional HSC Criteria

Alternatives 1 and 2 do not meet several California HSC criteria for the entire Site, including the health and safety risks posed by contamination at the Site and the effect of contamination on future uses of the Site. Alternatives 3 and 4 would meet all California HSC criteria. Alternative 4 would result in the greatest offsite environmental impact due to hauling and transportation of all excavated soil to an offsite landfill facility.

6.5 Alternatives Screening Results

The comparative analysis of remedial alternatives discussed in the previous section is summarized in **Table 12**. Scores were assigned to each remedial alternative for each of the above criteria based on whether the alternative meets the criterion, mostly meets the criterion, partially meets the criterion, or does not meet the criterion.

Alternatives 1 and 2 are not adequately protective and scored low for threshold criteria and several balancing criteria. Alternatives 3 and 4 are similarly protective in that COCs in existing fill would be isolated beneath a cap and potential exposure pathways would be incomplete. Alternative 3 scored the highest based on (1) comparable protectiveness as compared with Alternative 4; and (2) the lowest environmental impact by virtue of off-hauling less soil than Alternative 4. Based on the comparative analysis of remedial alternatives, Alternative 3 was selected as the preferred alternative.

7. PREFERRED REMEDIAL ALTERNATIVE

This section provides an overview of the implementation activities for the preferred remedial alternative. Based on the evaluation and comparison of the four alternatives, Alternative 3 – *Land Use Restrictions / Engineering Controls / Soil Capping and Excavation with Relocation and/or Offsite Disposal and/or Onsite Ex Situ Treatment / In Situ Groundwater Treatment and Monitoring* is the preferred alternative.

Implementation of the preferred alternative will involve pre-development activities and remediation/mitigation activities, which may be conducted prior to or concurrent with development activities. This section is organized by activity as follows:

- Assessment of soil conditions following demolition of existing buildings and removal of concrete slabs;
- Decommissioning of existing groundwater monitoring wells prior to soil cap placement and Site regrading;
- Excavation of approximately 3,000 bank cubic yards of soil within the CVOC Area and up to 17,000 bank cubic yards of soil in other areas containing COCs at concentrations exceeding soil CULs that cannot be capped in place, and (1) offsite disposal of up to 10,000 bank (12,000 bulk) cubic yards of soil; (2) relocation and capping of up to 10,000 bank (12,000 bulk) cubic yards of soil; or (3) onsite ex situ treatment of impacted soil as required for development;
- In situ remediation of groundwater impacted with volatile COCs above vapor intrusion screening levels and post-remediation groundwater monitoring;
- Capping of soil in place that contains COCs at concentrations exceeding soil CULs in areas of the future development where development conditions meet the prescriptive definition of a cap (i.e., a soil cap of imported clean fill with minimum thickness of 5 feet or hardscape);
- Soil vapor and groundwater confirmation sampling following cap placement and prior to vertical development;
- Land use restrictions, including prohibition of the use of groundwater, soil management requirements, and the O&M of caps and vapor mitigation systems;
- Engineering controls, including dust emission and stormwater runoff controls during construction and mitigation of VOC vapors from soil and groundwater into occupied buildings, if necessary; and
- If necessary, excavation, onsite ex situ treatment, relocation, and capping of TPH-impacted soils.

As discussed in Section 6.4, the combined remedial elements of the preferred alternative satisfy the ARARs and TBCs in **Table 10**, including Measure JJ. Specific information regarding the pre-construction activities, excavation of soils, stockpiling and staging of soils, haul roads, traffic control elements, dust control and air monitoring programs, erosion control measures, and other details regarding the preferred remedial approach will be set forth in the RDIP(s) and O&M plans.

If additional impacted soils or subsurface structures (i.e., tanks, sumps, piping, etc.) are discovered during grading activities, appropriate management and characterization of impacted soils will be conducted under an unexpected conditions response plan, which will be a component of the RDIP, to be approved by the RWQCB in advance of Site development. Although not anticipated, if any hazardous materials are identified onsite, they will either be: (1) relocated under areas slated for redevelopment under a soil cap of minimum 5-foot thickness; (2) placed under roadways, building foundations, or other hardscape; or (3) excavated and disposed offsite. Soil import criteria will be the same as the acceptance criteria for the landfill (**Appendix F**), which is equal to or lower than the residential soil CULs (Section 4.2.1).

7.1 Soil Assessment Following Demolition of Existing Buildings

Redevelopment activities at the Site will include the demolition of existing buildings and removal of the foundation slabs. Any hazardous building materials, if present, will be appropriately abated prior to building demolition. Following demolition of the existing buildings and removal of the foundation slabs, a post-demolition soil assessment will be conducted. Soil will be surveyed visually for evidence of staining and scanned with a handheld VOC detector. Areas where chemical releases have an elevated likelihood of occurrence, such as sumps and floor drains, will be targeted. If evidence of a historical chemical release is observed, soil samples will be collected and transported to an analytical laboratory for analysis. In addition, following demolition of aboveground structures, shallow soil samples will be collected from the area of the former hide and glue factory and analyzed for PCP. The details of the post-demolition assessment will be provided in the RDIP.

7.2 Decommissioning of Existing Groundwater Monitoring Wells

Existing groundwater monitoring wells will be decommissioned prior to soil import and regrading. Temporary well removal and replacement are considered redevelopment activities and are not included in the remedial alternative cost estimate. All well decommissioning will be completed with a permit from the San Mateo County Environmental Health division and in accordance with a RWQCB-approved work plan.

7.3 Excavation with Partial Onsite Relocation and Partial Offsite Disposal of Soils

Based on current data, approximately 3,000 bank cubic yards of soil will be excavated from the CVOC Area, stockpiled for characterization, and off-hauled to an appropriate offsite disposal facility. Prior to preparing the RDIP, a remedial delineation will be conducted to determine the excavation limits.

Additionally, in areas where soil cannot be capped with a minimum of 5 feet of clean fill (for example, along Bayshore Boulevard where the Site grade cannot be abruptly raised by 5 feet), impacted soil will be excavated and relocated onsite beneath roadways, hardscape, a soil cap, or a minimum of 1 foot beneath clean utility corridors. Alternatively, impacted soil may be transported offsite for disposal. It is anticipated that up to 10,00 bank (12,000 bulk) cubic yards of soil will be excavated and relocated onsite, and up to 10,000 bank (12,000 bulk) cubic yards of soil will be excavated and off-hauled for offsite disposal. Details will be specified in the RDIP or Soil

Management Plan as appropriate. All soil excavation, stockpiling, relocation, and/or off-haul will be conducted in accordance with the Dust Control Plan and SWPPP to be provided in the RDIP.

7.4 Excavation and Onsite Ex Situ Treatment and Relocation of Soils

In areas where TPH concentrations in soil exceed the CULs, free-phase petroleum is potentially mobile within the soil matrix, and offsite disposal would not be cost-effective, impacted soil may be excavated and treated onsite using an ex situ thermal smoldering technology. Onsite treatment of TPH-impacted soil is currently retained as an optional component to Alternative 3. Bench scale tests will be performed prior to preparation of the RDIP to develop a procedure for identifying potentially mobile petroleum and to determine the most effective thermal technology and treatment process design.

7.5 Placement of Soil Cap

Prior to constructing the soil cap, a bright-colored demarcation geotextile fabric will be placed above the existing fill wherever COC concentrations exceed CULs to indicate the contact between the impacted existing fill and the placement of import fill beneath the soil cap. Soil containing COCs in concentrations that exceed the CULs will then be capped in place to the extent dictated by the development grading plan. Clean import fill material satisfying the criteria in the soil import plan, which will be based on the DTSC's Clean Fill Advisory [DTSC, 2001], will be placed and compacted to provide a soil cap of minimum 5-foot thickness. Details of the means and methods for installing the cap will be provided in the RDIP. In accordance with State of California Sea-Level Rise Guidance and San Francisco Bay Conservation and Development Commission's Bay Plan, the final grade shall meet the requirements for long-term protection of OU-2 from flooding and inundation due to anticipated sea level rise elevation and extreme climate/weather events through the year 2100.

Following cap placement, any planned utility trenches/corridors requiring excavation into the existing fill at the Site will be excavated, followed by installation of a demarcation geotextile fabric along the bottom and sides to indicate the contact between the impacted existing fill and the clean imported fill prior to utility installation and backfill. This will create trenches/corridors that can be re-excavated in the future for utility repair or additional utility installation without coming into contact with residual contamination in the existing fill material.

All earthwork at the Site will be conducted in accordance with a Dust Control Plan, which will be provided in the RDIP. The Dust Control Plan will define the methods to be used for dust monitoring and procedures for minimizing dust emission. Perimeter air monitoring will be conducted to verify the effectiveness of dust control measures. The generation of airborne dust will be controlled by one or more of the following methods:

- Dampening active earthwork areas with clean water;
- Installing rumble strips or similar to prevent Site soils from being tracked out of the Site and onto public roads;
- Decontaminating haul trucks and equipment prior to their leaving the Site;
- Covering/stabilizing soil stockpiles;

- Restricting the height from which soil can be dropped from an excavator bucket into a haul truck; and
- Stopping work if wind speeds exceed a pre-determined threshold.

All earthwork will also be conducted in accordance with a Storm Water Pollution Prevention Plan (SWPPP) to minimize impacts to the local storm water conveyance system and receiving waters. The SWPPP will identify best management practices for controlling storm water and preventing sediment transport in run-off at the Site during construction. Best management practices will likely include placing sand or gravel bags or straw waddles at the property boundary adjacent to active earthwork or disturbed, uncompacted soil. Details of both the Dust Control Plan and the SWPPP will be provided in the RDIP.

7.6 Groundwater Remediation Program

In situ groundwater remediation will be implemented in the CVOC Area (Investigation Zones 4 and 6) to reduce VOC concentrations in groundwater to below CULs for the vapor intrusion pathway to the extent practicable. Groundwater remedial actions will be planned and implemented to achieve groundwater CULs to the extent practicable. In situ treatment using biological and/or chemical technologies for VOC-impacted Fill groundwater is the preferred groundwater remedial action. It is anticipated that multiple rounds of injections may be necessary to reduce VOC concentrations in groundwater to below CULs. If groundwater is not treated to CULs after multiple injections, the effectiveness of additional groundwater treatment will be evaluated in consultation with RWQCB. Experience implementing in situ groundwater remediation at other OUs will be used to inform the remedy design. Injections will be performed under the oversight of a California Registered Professional Engineer (P.E.) or Professional Geologist (P.G.), and a responsible/competent person will be onsite to provide direction to the injection contractor based on observed field conditions.

7.7 Groundwater Monitoring Program

Groundwater monitoring will be implemented as part of the groundwater remediation program. In addition to COC concentrations, other analyses may be performed to evaluate the effectiveness of the selected treatment technology; details will be specified in the RDIP. The well network and frequency of sampling will also be presented in the RDIP.

Groundwater monitoring wells will be installed after emplacement of the soil cap (Section 7.5). The groundwater monitoring well network will consist of reinstallation of select wells destroyed prior to regrading plus wells in the treatment area of the groundwater remediation (Section 7.6). Groundwater monitoring data will be used to evaluate the effectiveness of remedial activities and progress toward RAOs. The status of Site remediation will be reviewed in groundwater monitoring reports to be submitted to the RWQCB.

7.8 Soil Vapor Intrusion Evaluation

After the Site has been capped and regraded to the new baseline development elevation, the groundwater remedy has been implemented (Section 7.6), a soil vapor intrusion evaluation will be conducted. This evaluation will consist of a multiple lines of evidence approach, including

estimating the time that future soil vapor concentrations will reach steady state at different depths in the imported soil by the method of Johnson et al., [1999] and field testing to establish a depth-specific soil vapor profile. The evaluation will be conducted in accordance with current RWQCB soil vapor guidance. The detailed evaluation will be specified in the RDIP. Based on the data, the need for vapor mitigation systems in buildings planned for construction will be determined. If VOC concentrations in soil vapor exceed the screening levels provided in Section 4.2.3, a site-specific assessment (e.g., taking into consideration Site specific conditions and building type) will be conducted to determine the necessity of a vapor mitigation system. The design, installation, operation, and maintenance of vapor intrusion mitigation systems will be the responsibility of the Site owner or current building owner. In areas where CVOC concentrations in soil vapor exceed risk-based Site-specific CULs, two rounds of indoor air sampling will be conducted post-construction to verify attenuation factor assumptions and test for seasonality. Additional indoor air sampling may be required based on exceedance of health-based screening levels.

7.9 Land Use Restrictions

One or more Land Use Covenants will be recorded on the title to the property that will document restrictions to limit human exposures to contaminants left in place in soil, groundwater, and/or soil vapor above levels considered protective of unrestricted use of the Site. The Land Use Covenant will include the following restrictions:

One or more land use covenants will be recorded on the title to the property with restrictions to limit human exposures to contaminants left in place in soil, soil vapor, and groundwater above levels considered protective of unrestricted use of the Site. The land use covenant(s) will include the following restrictions:

- No occupied buildings, including sensitive uses, where COC concentrations in soil vapor exceed CULs without RWQCB approval based on either (1) a risk assessment demonstrating Site conditions pose no significant risk to human health; or (2) engineering controls, such as building design or gas intrusion mitigation systems, that will reduce the risk to an acceptable level;
- No growing produce or vegetables for human consumption in native soil. Plants for human consumption may be grown if they are planted in raised beds (above the approved cover) containing non-native soil. Trees producing edible fruit (including trees producing edible nuts) may also be planted provided they are grown in containers with a bottom that prevents the roots from penetrating the native soil;
- No extraction or use of underlying groundwater is allowed without a Groundwater Management Plan pre-approved by RWQCB;
- No drilling for any water, oil, or gas, or extraction or removal of groundwater without a RWQCB-approved Groundwater Management Plan and prior written approval by RWQCB;
- No interference with, or modification of, a vapor mitigation system shall be permitted without prior written approval by RWQCB, and future tenants must provide reasonable access for O&M of vapor mitigation systems;
- All excavation into the cap shall comply with the RWQCB-approved SMP;

- Contaminated soils brought to the surface by grading, excavation, trenching or backfilling shall be managed in accordance with all applicable provisions of state and federal law and a RWQCB-approved SMP; and
- All uses and development of the Site shall preserve the integrity and effectiveness of the cap.

7.10 O&M

Site inspections will be conducted annually to evaluate the effectiveness of the cap and ensure compliance with land use covenant(s). The O&M program will be detailed in an O&M Plan but will generally consist of annual inspections to verify that the soil cap is not eroding, that engineered cap materials are in good condition, that unauthorized wells providing access to restricted groundwater or unauthorized excavations into impacted soil have not been constructed. Building-specific land use restrictions and O&M plans may be necessary to document the proper functioning of the vapor intrusion mitigation systems.

A SMP will also be prepared that will specify the protocols to be followed for excavating into and beneath the cap. An inspection report will be submitted to RWQCB for review and approval annually. All O&M activities will be the responsibility of the Site owner (or the building owner in the event a vapor intrusion mitigation system is required) and will be governed by an O&M Agreement with the RWQCB.

The completed remedy will be evaluated every five years in reports submitted to RWQCB for review and approval. The Five-Year Review Report will assess the continued protectiveness of the remedy for human health and the environment. The Five-Year Review Reports will also consider adaptation to sea level rise over time. In accordance with the State of California Sea-Level Rise Guidance and San Francisco Bay Conservation and Development Commission's Bay Plan, the initial adaptive management strategy against sea level rise submitted in the RDIP shall be updated and submitted every five years throughout the operational life of the Site with the most recently available and credible information and climate change adaptation guidance at the time of the update.

8. SCHEDULE

The schedule for project implementation will be presented for review and comment by the RWQCB. In general, the anticipated schedule following approval of this FS/RAP is as follows; however, implementation may be conducted in phases:

Tasks	Completion Date
Pre-Design Characterization	Second Quarter 2022
RDIP Submittal	Third Quarter 2022
Permitting	Fourth Quarter 2022
Initiate Remedial Action Implementation	First Quarter 2023
Complete Remedial Construction	Third Quarter 2024

The RDIPs will contain a detailed description of the remedial work to be performed as well as the schedule for implementation. The RDIPs will include design drawings, a health and safety plan, procedures for minimizing fugitive dust emission, the program for monitoring air and dust during remedial construction, procedures for managing storm water during remedial construction, an adaptive management strategy for sea level rise that provides technical justification for year 2100 protective strategies, a traffic plan for the import and off-haul of soil, and a plan for restricting Site access to authorized personnel only.

It is anticipated that the remedial action activities for the Site will occur in multiple phases, and that separate RDIPs and Remedial Action Completion Reports may be prepared for each phase after completion of the remedial action. However, if the remedy is implemented at one time, a single Remedial Action Completion Report will be prepared. After each remedial action is completed, a location-specific O&M Plan will be prepared, and a Land Use Covenant will be recorded. The Completion Reports will provide a description of work completed, a summary of any deviations from this FS/RAP, and verification that CULs were met or Site protectiveness was achieved. Each Completion Report will also include a request that RWQCB certify the completion of the remedial actions once the O&M Plan and Land Use Covenants are in place.

9. REFERENCES

American Cancer Society. 2017. Cancer Facts and Figures. Website address: http://www.cancer.org/docroot/stt/stt_0.asp

Agency for Toxic Substances and Disease Registry (ATSDR). 2001. Public Health Statement for Pentachlorophenol. https://www.atsdr.cdc.gov/phs/phs.asp?id=400&tid=70. Accessed May 6, 2020.

Burns and McDonnell Waste Consultants (B&M), Inc. 1997. Additional Site Characterization Report, Former Bayshore Railyard, Brisbane, California. December.

B&M. 1998a. Remedial Action Objectives (RAOs) for the Former Bayshore Railyard Site, Brisbane, California. July.

B&M. 1998b. Groundwater Plume Stability Evaluation, Former Bayshore Railyard Site, Brisbane, California. 9 October.

B&M. 1999. Remedial Action Plan, Southern Area of Former Bayshore Railyard Site, Brisbane, California. October.

B&M. 2000. Addendum to Remedial Action Plan, Southern Area of Former Bayshore Railyard Site, Brisbane, California. May.

B&M. 2001. Investigation Report, Supplemental Bunker C Delineation, Southern Area of the Former Bayshore Railroad Site, Brisbane, California. August.

B&M. 2002a. Revised Remedial Action Plan, Southern Area of the Former Bayshore Railyard Site, Brisbane, California. 22 February.

B&M. 2002b. Investigation Report, Chlorinated Solvents, South Area, Former Bayshore Railyard, Brisbane, California. May.

B&M. 2004. Brisbane Baylands Wetland Mitigation Plan. May.

B&M. 2005. Interim Remedial Measure Workplan, Southern Area of the Former Bayshore Railyard Site (OU-2), Brisbane, California.

B&M. 2006. Groundwater Monitoring Report, December 2005 Sampling Event, South Portion of the Former Bayshore Railyard, Brisbane, California. 23 February.

B&M. 2007. OU-2 Additional Investigation in the area of HVOC plume, San Francisco and Brisbane, California. 19 February.

B&M. 2018. Semi-annual Groundwater Monitoring Report: February 2018. Former Brisbane Railyard: Operable Unit 2 (OU-2). 3 August.

B&M. 2019. Semi-annual Groundwater Monitoring Report: August 2018, Former Brisbane Railyard: Operable Unit 2 (OU-2). 28 January.

B&M. 2020. Semi-annual Groundwater Monitoring Report. August 2019. Former Brisbane Railyard. Operable Unit 2 (OU-2). 22 January.

Burns and McDonnell, Treadwell and Rollo (B&M and T&R). 2002. Remedial Investigation Report Joint Groundwater Operable Unit, San Francisco, California. September.

California Natural Resources Agency. 2018. State of California Sea-Level Rise Guidance. 14 March.

California Department of Toxic Substances Control (DTSC). 1985. Order to Post and Fence. In the matter of Southern Pacific Transportation Company, Brisbane Yard, Brisbane. 17 December.

County of San Mateo. 2018. Sea Level Rise Vulnerability Assessment, Final Report. March.

DTSC. 1990. Imminent and/or Substantial Endangerment Order and Remedial Action Order I/SE-89/90-004. 22 February.

DTSC. 1993. Final Remedial Action Plan, Bayshore Railyard North Area, San Francisco, California. December.

DTSC. 1995a. Remedial Action Plan Policy, DTSC Guidance Document No. EO-95-007-PP.

DTSC. 1995b. Fourth Amendment to Imminent and/or Substantial Endangerment Order and Remedial Action Order I/SE-89/90-004. 22 August.

DTSC. 2001. Information Advisory, Clean Imported Fill Material. October.

DTSC. 2009a. Use of the Northern and Southern California Polynuclear Aromatic Hydrocarbon (PAH) Studies in the Manufactured Gas Plant Site Cleanup Process. 1 July.

DTSC. 2009b. Approval of the Feasibility Study/Remedial Action Plan for the Schlage OU and UPC OU-SF. 16 November.

DTSC, 2011. Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion to Indoor Air (Vapor Intrusion Guidance). October.

Ecology & Environment, Inc. 1985. Soil and Groundwater Investigation of the Southern Pacific Transportation Company Bayshore Railroad Yard, Brisbane, California. January.

Ecology & Environment, Inc. 1987. Recommendation for Further Action, Stauffer Chemical Company, 200 Industrial Way, Brisbane, CA 94005. 19 January.

ESA. 2018. Brisbane Baylands, Draft Environmental Impact Report, State Clearinghouse #2006022136. 19 July.

Geomatrix Consultants. 1991a. Underground Storage Tank Removal, 285 Industrial Way, Brisbane, California. 17 June.

Geomatrix Consultants. 1991b. Underground Storage Tank Removal, 350 Industrial Way, Brisbane, California. 17 June.

Geosyntec. 2018. Final Data Gap Investigation Work Plan, Operable Unit 2, Brisbane, California. 27 November.

Geosyntec. 2019a. Data Gap Investigation Report, Brisbane OU2, Brisbane, California. 7 February.

Geosyntec. 2019b. Draft Feasibility Study and Remedial Action Plan, UPC OU-SM, Brisbane, California. 23 December.

Hydrologic Consultants, Inc. 1989. Remedial Investigation Data Study Report for Southern Pacific Transportation Company, Bayshore Facility, Brisbane, California. 16 May.

Johnson, P.C., M.W. Kemblowski, and R.L. Johnson. 1999. Assessing the Significance of Subsurface Contaminant Vapor Migration to Enclosed Spaces: Site-Specific Alternatives to Generic Estimates. *Journal of Soil Contamination*, v. 8, no. 3, p. 389 - 421.

Lawrence Berkeley National Laboratory (LBNL). 2009. Analysis of Background Distributions of Metals in the Soil at Lawrence Berkeley National Laboratory. June 2002. Revised April 2009.

Levine-Fricke. 1990. Draft Supplemental Remedial Investigation, Data Study Report, The Bayshore Railyard, Brisbane, California. 18 July.

Levine-Fricke. 1991. Feasibility Study Report, Bayshore Railyard, Brisbane, California. 1 December.

Lipps J, 2013. "Caltrain150: Rise and Fall of the Bayshore Roundhouse". https://peninsulamoves.org/2013/11/07/caltrain150-rise-and-fall-of-the-bayshore-roundhouse/.

MACTEC Engineering and Consulting, Inc. (MACTEC). 2009. Feasibility Study/Remedial Action Plan, Schlage Operable Unit and San Francisco County Portion of Universal Paragon Corporation Operable Unit, San Francisco, California. 4 November.

MACTEC. 2010. Groundwater Monitoring Report, First Quarter 2010. Schlage OU, San Francisco and Brisbane, California. 21 May.

McAllister, K.A., L. Hung, J.T. Trevors. 1996. Microbial Degradation of Pentachlorophenol. *Biodegradation*, v. 7, p. 1-40.

Office of Environmental Health Hazard Assessment (OEHHA). 2009. Revised California Human Health Screening Levels for Lead.

San Francisco Bay Regional Water Quality Control Board (RWQCB). 2002. Conditional Approval of Revised Conceptual Remedial Action Plan for Southern Portion (Operable Unit 2) of the Former Bayshore Railyard Site, Brisbane, San Mateo County, California.

RWQCB. 2008. No Further Action Required for Underground Storage Tanks at 250 and 350 Industrial Way, Brisbane, CA 94005. 16 April.

RWQCB. 2019a. Environmental Screening Levels (ESLs). 24 January.

RWQCB. 2019b. Concurrence with the Technical Evaluation of Groundwater Quality Report, Brisbane Baylands, San Mateo County. 6 May.

RWQCB. 2019c. User's Guide: Derivation and Application of Environmental Screening Levels (ESLs), Interim Final 2019 (Revision 1). July.

Treadwell & Rollo, Inc. (T&R). 1992. Soil Quality Assessment, Industrial Way Properties, Brisbane, California. 15 October.

T&R. 1993. Information Submittal, Industrial Way Properties, Brisbane, California. 9 June.

United States Environmental Protection Agency (USEPA). 1988. CERCLA Compliance with Other Laws Manual (Interim Final), USEPA Office of Solid Waste and Emergency Response (OSWER) Directive 9234.1-01. August.

USEPA. 1989a. CERCLA Compliance with Other Laws Manual: Part II, Clean Air Act and Other Environmental Statutes and State Requirements (Interim Final), OSWER Directive 9234.1-02. August.

USEPA. 1989b. Risk Assessment Guidance for Superfund Volume I - Human Health Evaluation Manual, Part A (RAGS). EPA/540/1-89/002.

USEPA. 1989c. Guidance for Conducting Remedial Investigation/Feasibility Studies Under CERCLA. Interim Final. EPA 540/G-89/001. October.

USEPA. 1990. National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 Code of Federal Regulations (CFR), Part 300.400.

USEPA. 1999. A Guide to Preparing Superfund Proposed Plans, Records of Decision, and Other Remedy Selection Decision Documents.

USEPA. 2002. Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. Office of Solid Waste and Emergency Response. OSWER 9355.4-24.

USEPA. 2011. National Air Toxics Assessment. Website address: https://www.epa.gov/national-air-toxics-assessment/2011-national-air-toxics-assessment

Universal Paragon Corporation, Inc. (UPC). 2011a. Email from Mr. Jason Lin of UPC to Mr. Krzysztof Jesionek of Geosyntec. 1 November.

UPC. 2011b. Areas/Boundaries of OU1 and OU2. Email from Mr. Howard Pearce of UPC to Mr. Krzysztof Jesionek of Geosyntec. 7 December.

Weiss Associates, Inc. (Weiss). 2006. Sunquest Industrial Way Property Destruction of Monitoring Well MW-1, 350 Industrial Way, Brisbane, California. 15 December.

Weiss. 2008. Draft Site Characterization Report, Former UST Sites, 250 and 350 Industrial Way, Brisbane, California. 31 March.

TABLES

Table 1: Groundwater Well and Piezometer Construction Details

Brisbane Baylands OU-2
Brisbane, California

Well Name	Well Installation Date	Easting	Northing	Top of Casing Elevation (ft msl)[1]	Ground Surface Elevation (ft msl)[1]	Casing Diameter (inches)	Total Well Depth (ft bgs)	Screened Interval (ft bgs)
KMW-3B	1/7/1987	6011433.50	2083077.30	10.54	--	4	60	38-60
KMW-4A	1/7/1987	6011439.60	2083065.30	10.46	5.95	4	12	2-11
KMW-6B	1/5/1987	6011402.30	2081057.50	13.42	--	4	61.5	50-61
KMW-7A	1/5/1987	6011403.40	2081051.20	13.66	5.90	4	12	2-11
LF-3A	4/23/1990	6010112.88	2084018.53	10.95	6.03	2	15	4-10
LF-3B	5/1/1990	6010114.78	2084042.33	12.50	--	2	44.5	27-42
LF-4A	4/23/1990	6010443.93	2083091.66	8.32	6.06	2	15	4-14
LF-4B	5/2/1990	6010446.95	2083077.59	10.64	--	2	60	49.5-59.5
LF-5A	4/24/1990	6010561.48	2082562.44	8.49	5.77	2	8	2.5-8
LF-5B	5/2/1990	6010559.92	2082539.95	10.05	--	2	54.5	42-52
LF-6B	4/30/1990	6010407.76	2083473.54	9.87	--	2	44.5	34.5-44.5
LF-7A	4/24/1990	6010502.12	2081619.64	10.65	5.12	2	10	4-8
LF-8A	4/26/1990	6010263.93	2082245.37	9.36	--	2	10	5-10
LF-8B	5/17/1990	6010274.84	2082215.29	11.25	--	2	65	55-65
MK-1A	1/15/1986	6009698.61	2083583.88	10.47	5.84	2	15	3-13
MK-7A	1/23/1986	6010393.11	2081923.07	10.50	5.05	2	10	3-10
MK-7B	1/23/1986	6010395.99	2081916.37	11.46	4.67	2	43	33-43
MK-8A	1/15/1986	6010807.96	2081013.49	16.58	--	2	10	5-10
MK-8B[3]	--	6010807.96	2081013.49	19.37	--	--	--	--
MK-12B	3/28/1984	6012022.06	2080388.42	14.00	--	2	26.5	21.5-26.5
MW-1B	3/28/1984	6009699.63	2083567.74	8.14	--	2	39.5	34.5-39.5
MW-9A	3/28/1984	6010635.46	2084390.10	11.26	--	2	13	3-13
MW-9B	3/29/1984	6010636.43	2084374.13	10.20	--	2	39	34-39
MW-10A	3/16/1984	6010983.57	2081594.71	9.59	5.92	2	13	3-13
MW-10B	3/23/1984	6010980.66	2081576.80	10.19	--	2	38	33-38
MW-11AR[2]	1/18/2017	6011444.85	2084455.15	14.94	5.55	2	13	3-13
MW-11B	3/28/1984	6011458.75	2084452.94	14.85	--	2	38	33-38
MW-13A	3/27/1984	6010202.26	2082823.78	7.81	6.16	2	13	3-13
MW-13B	3/27/1984	6010205.16	2082841.70	--	--	2	38	33-38
MW-14A	3/21/1984	6010371.51	2083018.51	7.58	--	2	13	3-13
MW-14B	3/21/1984	6011833.36	2080495.32	8.18	--	2	48	43-48
MW-15A	3/21/1984	6010399.43	2083454.33	8.67	6.00	2	13	3-13
MW-16B	3/20/1984	6010220.29	2083474.43	9.95	--	2	40	35-40
MW-17A	3/19/1984	6009952.01	2083335.98	8.45	6.00	2	13	3-13
MW-17B	3/19/1984	6009935.28	2083340.68	8.30	--	2	40	35-40
OTP-1[4]	4/26/1990	6010933.79	2083339.58	--	--	1	8.5	3.5-8.5
OTP-2[4]	4/25/1990	6010950.87	2082341.14	9.77	--	1	13	8-13
OTP-3[4]	5/4/1990	6010866.09	2083826.77	--	--	1	9	4-9
OTP-4[4]	4/25/1990	6010221.43	2083155.44	--	--	1	9.5	4.5-9.5
SDP-1	4/25/1990	6010704.67	2081745.63	10.84	--	1	6.5	3-6.5
SDP-2	4/25/1990	6010672.15	2081403.55	10.68	--	1	8.5	2.5-7.5
SDP-3	4/25/1990	6010808.05	2081229.37	11.35	--	1	9	3-8
SDP-4	--	6010542.26	2081352.70	6.62	--	--	--	--
SDP-5	4/25/1990	6010683.67	2081112.45	--	--	1	10	3-8

Notes:

1. Elevations were measured during well installation and may have changed since the time of measurement.
2. MW-11A was decommissioned, and replacement well MW-11AR was installed on 18 January 2017 (B&M, 2017. Monitoring Well Replacement Report, Former Brisbane Railyard Operable Unit 2 (OU-2). 17 July.)
3. Well MK-8B resurveyed by LUK Associates (for B&M) on 15 February 2017.
4. Location approximate, estimated from figures in Levine-Fricke, 1991 (Feasibility Study Report).

- Northing and Easting are based on Coordinate System NAD83, California Zone 3. Elevations are based on NGVD29 (mean sea level).

Abbreviations and Symbols:

-- = not available
ft bgs = feet below ground surface
ft msl = feet above mean sea level

Table 2: Metals Concentrations in Soil
Brisbane Baylands OU-2
Brisbane, California

Sample Location	Investigation Zone	Depth Range (ft bgs)	Sample Name	Collection Date	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
Direct Exposure Human Health Risk Level Residential Soil Exposure ESL [1]					1.1E+01	6.7E-02	1.5E+04	1.6E+01	7.8E+01	1.2E+05	2.3E+01	3.1E+03	8.0E+01	1.3E+01	3.9E+02	8.2E+02	3.9E+02	3.9E+02	7.8E-01	3.9E+02	2.3E+04
Regional Background [2]					5.5E+00	1.9E+01	3.2E+02	1.0E+00	2.7E+00	1.0E+02	2.5E+01	6.9E+01	1.6E+01	4.0E-01	7.4E+00	1.2E+02	5.6E+00	1.8E+00	7.6E+00	7.4E+01	1.1E+02
Units					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
DG-AA2	1	0.5-1	DG-AA2S-0.5-1	12/14/2018	**2.9**	**130**	**70**	<0.11	**0.36 J**	**16**	**11**	**220**	**230**	**0.13**	<0.21	**14**	<0.50	**0.83 U**	<0.48	**96**	**150**
DG-AA2	1	3.5-4	DG-AA2S-3.5-4	12/14/2018	**2.1**	**37**	**81**	**0.19 J**	<0.034	**81**	**13**	**30**	**4.3**	**0.46**	<0.18	**120**	<0.41	**0.69 U**	<0.40	**63**	**46**
DG-AA3	1	0.5-1	DG-AA3S-0.5-1	12/18/2018	**3.9**	**87**	**150**	<0.11	**1.9 J**	**27 J**	**11**	**210**	**310 J**	**0.34 J**	**1.8**	**30 J**	**1.1 J**	**0.84 U**	<0.49	**66**	**360**
DG-AA3	1	3.5-4	DG-AA3S-3.5-4	12/18/2018	<0.32	**4.8**	**110**	<0.13	**0.21 J**	**140**	**20**	**36**	**11**	**0.85**	**0.63 J**	**190**	<0.58	<0.20	<0.56	**83**	**56**
DG-AA3	1	7-7.5	DG-AA3S-7-7.5	12/18/2018	**1.1 J**	**40**	**36**	**0.49**	**0.10 J**	**33**	**13**	**19**	**10**	**0.075**	**0.67 J**	**28**	<0.52	<0.17	<0.50	**43**	**53**
DG-AA3 (D)	1	0.5-1	DG-AA3 (D)S-0.5-1	12/18/2018	**4.7**	**93**	**120**	<0.11	**4.2 J**	**59 J**	**10**	**240**	**520 J**	**0.95 J**	**2.2**	**52 J**	**1.3 J**	**0.40 J**	<0.51	**47**	**510**
DG-AA4	1	0.5-1	DG-AA4S-0.5-1	12/18/2018	**0.97 J**	**77**	**83**	**0.13 J**	**0.54**	**17**	**11**	**160**	**100**	**0.062**	**0.64 J**	**8.3**	**1.1 J**	<0.14	<0.39	**110**	**160**
DG-AA4	1	3.5-4	DG-AA4S-3.5-4	12/18/2018	**0.79 J**	**65**	**31**	**0.22 J**	**0.040 J**	**54**	**5.5**	**11**	**5.2**	**0.041**	<0.21	**44**	<0.48	<0.16	<0.47	**29**	**22**
DG-AA5	1	0.5-1	DG-AA5S-0.5-1	12/18/2018	**2.5**	**51**	**95**	<0.11	**1.3**	**23**	**9.3**	**190**	**280**	**0.49**	**2.5**	**29**	**3.4 U**	**0.35 J**	<0.50	**60**	**520**
DG-AA5	1	3.5-4	DG-AA5S-3.5-4	12/18/2018	**2.0**	**170**	**72**	<0.12	**0.11 J**	**12**	**11**	**130**	**87**	**0.1**	<0.24	**14**	**3.7 U**	<0.19	<0.54	**78**	**100**
DG-AA6	1	0.5-1	DG-AA6S-0.5-1	12/20/2018	**1.4**	**2.8 U**	**53**	<0.092	**0.35 U**	**10**	**16**	**110**	**31 J+**	**0.061**	**0.29 J**	**7.2**	<0.42	<0.14	**1.6**	**120**	**78**
DG-AA6	1	3.5-4	DG-AA6S-3.5-4	12/20/2018	**5.5**	**4.8**	**410**	**0.14 J**	**2.4**	**17**	**1.5**	**310**	**1,100**	**0.25**	<0.17	**8.2**	<0.41	**3.2**	<0.39	**6.6**	**1,800**
DG-AA7	1	0.5-1	DG-AA7S-0.5-1	1/9/2019	**2.6**	**6.0**	**100**	**0.16**	**1.0**	**38**	**14**	**220**	**150**	**0.25**	**3.3**	**32**	**2.4**	<0.14	<0.39	**84**	**270**
DG-AA7	1	3.5-4	DG-AA7S-3.5-4	1/9/2019	**2.9**	**4.6**	**140**	**0.19**	**0.43**	**19**	**6.5**	**50**	**180**	**0.079**	**0.51**	**28**	<0.58	**0.27**	<0.56	**32**	**170**
DG-AA8	1	0.5-1	DG-AA8S-0.5-1	1/29/2019	**13**	**26**	**740**	**0.24 J**	**2.8**	**43**	**11**	**860**	**2,000**	**0.60 J**	**1.0 J**	**38**	**2.0 J**	**4.7 J**	<0.40 R	**32**	**1,400**
DG-AA8	1	3.5-4	DG-AA8S-3.5-4	1/29/2019	**37 J**	**33**	**2,600**	<0.59 UJ	**28 J**	**310**	**14 J**	**1,500**	**12,000**	**0.022**	<1.2 UJ	**57 J+**	**3.6 J**	**16 J+**	<2.6 R	**31 J**	**10,000**
DG-AA8 (D)	1	0.5-1	DG-AA8 (D)S-0.5-1	1/29/2019	**20**	**17**	**1,000**	**0.30 J**	**3.5**	**28**	**7.2**	**560**	**2,600**	**1.1 J**	**1.0 J**	**29**	<1.3 UJ	**2.5 J**	<1.2 R	**24**	**1,500**
DG-AA9	1	0.5-1	DG-AA9S-0.5-1	12/20/2018	**29**	**41**	**1,200**	**0.56 J**	**2.4**	**49**	**10**	**840**	**3,900**	**0.79**	**0.95 J**	**53**	<1.7	**5.4**	<1.6	**35**	**2,400**
DG-AB2	1	0.5-1	DG-AB2S-0.5-1	12/14/2018	**0.50 J**	**2.1 J**	**58**	<0.084	**0.082 J**	**10**	**9.8**	**140**	**49**	**0.094**	<0.17	**9.3**	<0.39	**0.65 U**	<0.37	**91**	**80**
DG-AB2	1	3.5-4	DG-AB2S-3.5-4	12/14/2018	**2.7**	**95**	**98**	**0.15 J**	<0.027	**120**	**17**	**32**	**5.8**	**1.5**	<0.14	**150**	<0.32	**0.54 U**	<0.31	**64**	**52**
DG-AB2	1	7-7.5	DG-AB2S-7-7.5	12/14/2018	**1.8**	**48**	**57**	**0.6**	**0.18 J**	**49**	**16**	**46**	**15**	**0.24**	**0.70 J**	**62**	<0.32	<0.11	<0.31	**39**	**110**
DG-AB3	1	0.5-1	DG-AB3S-0.5-1	12/14/2018	**5.9**	**36**	**71**	<0.10	**3.5**	**15**	**10**	**200**	**200**	**0.49**	**1.1 J**	**37**	**1.1 J**	<0.16	<0.45	**66**	**180**
DG-AB3	1	3.5-4	DG-AB3S-3.5-4	12/14/2018	**5.5**	**20**	**180**	<0.13	**0.36 J**	**140**	**23**	**200**	**250**	**2.6**	**1.3 J**	**200**	**0.78 J**	<0.20	<0.56	**85**	**180**
DG-AB3	1	6.5-7	DG-AB3S-6.5-7	12/14/2018	**1.7**	**29**	**50**	**0.66**	<0.035	**34**	**10**	**41**	**8.8**	**0.041**	**0.95 J**	**32**	**1.6 J**	<0.14	<0.41	**41**	**67**
DG-AB4	1	0.5-1	DG-AB4S-0.5-1	12/18/2018	**2.4**	**110**	**51**	<0.11	**1.7**	**11**	**12**	**130**	**140**	**0.11**	**0.71 J**	**10**	<0.49	<0.17	<0.48	**81**	**300**
DG-AB4	1	3.5-4	DG-AB4S-3.5-4	12/18/2018	**0.64 J**	**31**	**58**	**0.15 J**	**0.066 J**	**55**	**6.6**	**8.8**	**5.5**	**0.021**	**0.76 J**	**44**	**0.64 J**	<0.10	<0.30	**36**	**25**
DG-AB4	1	9-9.5	DG-AB4S-9-9.5	12/18/2018	**1.1**	**13**	**47**	**0.47**	**0.076 J**	**37**	**12**	**37**	**13**	**0.035**	**0.98 J**	**30**	**0.44 J**	**0.37 J**	<0.33	**51**	**69**
DG-AB5	1	0.5-1	DG-AB5S-0.5-1	1/29/2019	**1.1 J**	**200**	**62**	**0.079 J**	**0.51**	**8.3 J**	**8.4**	**94**	**140**	**0.16**	<0.14 UJ	**9.7**	**0.68 J**	**0.15 J**	<0.32 R	**58**	**150**
DG-AB5	1	3.5-4	DG-AB5S-3.5-4	1/29/2019	**1.1 J**	**54**	**31**	<0.11	**0.24 J**	**21**	**3.6**	**13**	**11**	**0.035**	**0.22 J**	**17**	**0.98 J**	<0.17	<0.49	**17**	**27**
DG-AB5 (D)	1	0.5-1	DG-AB5 (D)S-0.5-1	1/29/2019	**2.1 J**	**180**	**58**	<0.10	**0.6**	**15 J**	**9.8**	**100**	**93**	**0.14**	**0.32 J**	**14**	**1.8 J**	<0.16	<0.45	**68**	**100**
DG-AB6	1	0.5-1	DG-AB6S-0.5-1	12/20/2018	**0.51 J**	**2.3 U**	**28**	<0.074	<0.028	**16**	**14**	**130**	**5.2**	**0.038**	<0.15	**11**	<0.34	<0.11	**0.86 J**	**96**	**55**
DG-AB6	1	3.5-4	DG-AB6S-3.5-4	12/20/2018	**6.7**	**8.2**	**360**	**0.17 J**	**0.8**	**14**	**2.8**	**590**	**1,100**	**0.34**	**0.73 J**	**12**	**0.44 J**	**1.7**	<0.29	**8.6**	**670**
DG-AB7	1	0.5-1	DG-AB7S-0.5-1	12/19/2018	**2.5**	**5.7**	**110**	<0.10	**1.6**	**48**	**14**	**150**	**150**	**0.19**	**1.7**	**67**	<0.47	<0.16	<0.45	**63**	**270**
DG-AB7	1	3.5-4	DG-AB7S-3.5-4	12/19/2018	**2.4**	**6.9**	**180**	<0.12	**0.40 J**	**21**	**5.7**	**60**	**280**	**0.055**	**0.50 J**	**82**	<0.56	**0.20 J**	<0.54	**33**	**220**
DG-AB8	1	0.5-1	DG-AB8S-0.5-1	1/31/2019	**0.72 J**	**4.7**	**62**	<0.077 U	**0.22 J**	**17**	**5.2**	**28**	**47**	**0.053**	**0.18 J**	**16**	**0.44 J**	<0.12 U	<0.34 U	**31**	**110**
DG-AB8	1	3.5-4	DG-AB8S-3.5-4	1/31/2019	**18**	**16**	**690**	**0.28 J**	**0.97**	**34**	**7.7**	**510**	**3,100**	**1.1**	**0.68 J**	**28**	**3.5**	**3.7**	<0.51 U	**27**	**1,200**
DG-AB9	1	0.5-1	DG-AB9S-0.5-1	1/30/2019	<0.24	**11**	**85**	**0.29**	**0.36**	**22**	**7**	**96**	**95**	**0.13**	<0.19	**20**	<0.43	<0.15	<0.42	**50**	**140**
DG-AB9	1	3.5-4	DG-AB9S-3.5-4	1/30/2019	**40**	**26**	**1,400**	**0.50 J**	**5.4**	**75**	**11**	**1,000**	**5,700**	**0.71**	**0.65 J**	**49**	<1.1	**8.7**	<1.1	**24**	**3,300**
DG-AC2	1	0.5-1	DG-AC2S-0.5-1	12/14/2018	<0.32	**3.8 U**	**31**	<0.13	**0.27 J**	**8.3**	**9.1**	**120**	**20**	**0.12**	**0.30 J**	**3.6**	<0.58	<0.19	<0.56	**85**	**54**
DG-AC2	1	3.5-4	DG-AC2S-3.5-4	12/14/2018	**0.60 J**	**62**	**97**	**0.30 J**	**0.15 J**	**160**	**18**	**24**	**5.0**	**1.6**	**1.4 J**	**210**	<0.54	<0.18	<0.52	**57**	**49**
DG-AC3	1	0.5-1	DG-AC3S-0.5-1	12/19/2018	**3.3 J-**	**20 J**	**61 J**	<0.12	**1.5**	**17 J**	**10 J**	**210 J**	**260 J**	**0.19**	**1.2 J**	**18 J**	<0.57	<0.19	<0.55	**77 J**	**230 J**
DG-AC3	1	3.5-4	DG-AC3S-3.5-4	12/19/2018	**1.0 J**	**11**	**150**	**0.5**	**0.092 J**	**160**	**25**	**47**	**26**	**7.2**	**0.90 J**	**210**	<0.43	<0.15	<0.42	**86**	**67**
DG-AC4	1	0.5-1	DG-AC4S-0.5-1	12/18/2018	**4.8**	**46 J**	**91**	<0.13	**0.95**	**20**	**9.9**	**210**	**270**	**0.1**	**2.1 J**	**16**	**1.6 J**	**0.43 J**	<0.58	**76**	**220**
DG-AC4	1	3.5-4	DG-AC4S-3.5-4	12/18/2018	**2.4**	**84**	**650**	**0.71**	**1.8**	**35**	**7.5**	**240**	**800**	**0.32**	**1.2 J**	**28**	<0.43	**1.1**	<0.41	**50**	**1,200**
DG-AC4 (D)	1	0.5-1	DG-AC4 (D)S-0.5-1	12/18/2018	**3.5**	**130 J**	**79**	<0.11	**0.69**	**19**	**9.1**	**160**	**240**	**0.066**	**1.0 J**	**18**	**0.53 J**	**0.32 J**	<0.50	**78**	**270**
DG-AC5	1	0.5-1	DG-AC5S-0.5-1	12/18/2018	**21**	**280**	**80**	<0.081	**1.7**	**22**	**8.3**	**600**	**1,300**	**0.52**	**0.39 J**	**32**	**2.5 U**	**0.63**	<0.36	**57**	**1,200**
DG-AC5	1	3.5-4	DG-AC5S-3.5-4	12/18/2018	**4.9**	**150**	**120**	<0.10	**1.5**	**26**	**9.9**	**300**	**540**	**0.38**	**1.1 J**	**36**	**3.2 U**	**0.43 J**	<0.46	**56**	**460**
DG-AC6	1	0.5-1	DG-AC6S-0.5-1	12/20/2018	**0.97 J**	**7.1**	**91**	<0.076	**0.56**	**23**	**9.4**	**120**	**88**	**0.084**	**0.64 J**	**23**	<0.35	<0.12	**0.41 J**	**69**	**180**
DG-AC6	1	3.5-4	DG-AC6S-3.5-4	12/20/2018	**2.2**	**4.4**	**190**	**0.22 J**	**0.33**	**25**	**6.8**	**100**	**370**	**0.093**	<0.16	**26**	<0.38	**0.41 J**	<0.37	**29**	**280**
DG-AC7	1	0.5-1	DG-AC7S-0.5-1	1/9/2019	**2.7**	**8.3**	**160**	**0.16**	**0.96**	**28**	**12**	**160**	**120**	**0.16**	**2.7**	**30**	**1.8**	<0.14	<0.41	**77**	**200**
DG-AC7	1	3.5-4	DG-AC7S-3.5-4	1/9/2019	**38**	**26**	**1,300**	**0.93**	**5.1**	**55**	**9.4**	**610**	**3,400**	**0.36**	**3.6**	**47**	**4.1**	**5.6**	**1.4**	**26**	**2,300**
DG-AC7	1	7.5-8	DG-AC7S-7.5-8	1/9/2019	**4.6**	**13**	**180**	**0.91**	**0.36**	**39**	**13**	**96**	**360**	**0.13**	**1.1**	**52**	**3.5**	**0.42**	**4.3**	**49**	**390**
DG-AC7 (D)	1	0.5-1	DG-AC7 (D)S-0.5-1	1/9/2019	**1.8**	**7.8**	**60**	**0.091**	**0.62**	**16**	**6.4**	**77**	**79**	**0.14**	**1.1**	**22**	**1.2**	**0.13**	<0.39	**38**	**130**

Table 2: Metals Concentrations in Soil
Brisbane Baylands OU-2
Brisbane, California

Sample Location	Investigation Zone	Depth Range (ft bgs)	Sample Name	Collection Date	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
Direct Exposure Human Health Risk Level Residential Soil Exposure ESL [1]					1.1E+01	6.7E-02	1.5E+04	1.6E+01	7.8E+01	1.2E+05	2.3E+01	3.1E+03	8.0E+01	1.3E+01	3.9E+02	8.2E+02	3.9E+02	3.9E+02	7.8E-01	3.9E+02	2.3E+04
Regional Background [2]					5.5E+00	1.9E+01	3.2E+02	1.0E+00	2.7E+00	1.0E+02	2.5E+01	6.9E+01	1.6E+01	4.0E-01	7.4E+00	1.2E+02	5.6E+00	1.8E+00	7.6E+00	7.4E+01	1.1E+02
Units					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
DG-AC8	1	0.5-1	DG-AC8S-0.5-1	1/31/2019	**14**	**28**	**260**	<0.096 U	**0.60 J**	**110**	**11**	**240**	**390**	**0.12**	**54**	**76**	**15 U**	<0.75 U	<0.43 U	**28**	**650**
DG-AC8	1	3.5-4	DG-AC8S-3.5-4	1/31/2019	**30**	**37**	**1,300**	**0.59 J**	**0.97 J**	**37**	**12**	**2,400**	**7,200**	**0.7**	**2.5 J**	**51**	**5.2 J**	**10**	<1.4 U	**19**	**2,000**
DG-AC9	1	0.5-1	DG-AC9S-0.5-1	12/20/2018	**2.2**	**3.8**	**75**	**0.24 J**	**0.87**	**22**	**10**	**120**	**190**	**0.12**	**0.94 J**	**18**	<0.45	<0.15	<0.44	**83**	**180**
DG-AC9	1	3.5-4	DG-AC9S-3.5-4	12/20/2018	**43**	**35**	**1,700**	**0.95**	**3.7**	**52**	**9.9**	**1,700**	**11,000**	**0.62**	**4.1 J**	**46**	<1.3	**8.9**	**2.1 J**	**37**	**2,800**
DG-AD2	1	0.5-1	DG-AD2S-0.5-1	12/14/2018	**0.97 J**	**21 J-**	**46 J**	**0.22 J**	**0.61**	**36 J**	**9.2**	**240**	**110 J**	**0.16**	**1.1 J**	**9.2**	<0.57	**0.22 J**	<0.55	**69 J+**	**160 J**
DG-AD2	1	3.5-4	DG-AD2S-3.5-4	12/14/2018	<0.20 UJ	**15**	**72**	<0.077 UJ	**0.11 J**	**100**	**14**	**22**	**3.6**	**0.45 J**	**0.43 J**	**120**	<0.36	<0.12	<0.34	**47**	**37**
DG-AD2 (D)	1	3.5-4	DG-AD2 (D)S-3.5-4	12/14/2018	**0.45 J**	**17**	**95**	**0.22 J**	**0.12 J**	**92**	**14**	**24**	**4.8**	**0.77 J**	**0.55 J**	**120**	<0.37	<0.13	<0.36	**51**	**45**
DG-AD3	1	0.5-1	DG-AD3S-0.5-1	12/14/2018	**33**	**470**	**200**	<0.13	**1.9**	**27**	**13**	**420**	**1,400**	**0.41**	**1.0 J**	**20**	**2.1 J**	**1.2**	<0.56	**94**	**480**
DG-AD3	1	3.5-4	DG-AD3S-3.5-4	12/14/2018	**2.3**	**25**	**110**	**0.23 U**	**0.16 J**	**170**	**20**	**49**	**48**	**3.7**	**0.77 J**	**170**	**1.2 J**	<0.12	<0.33	**68**	**73**
DG-AD4	1	0.5-1	DG-AD4S-0.5-1	12/18/2018	**1.3 J**	**24**	**55**	**0.31 J**	**0.53**	**12**	**11**	**120**	**89**	**0.059**	**0.73 J**	**9.1**	<0.50	<0.17	<0.48	**120**	**89**
DG-AD4	1	3.5-4	DG-AD4S-3.5-4	12/18/2018	**0.63 J**	**34**	**45**	**0.35 J**	**0.15 J**	**26**	**3.9**	**75**	**31**	**0.043**	<0.24	**21**	<0.56	<0.19	<0.54	**18**	**99**
DG-AD5	1	0.5-1	DG-AD5S-0.5-1	1/8/2019	**3.2**	**88**	**85**	<0.078	**0.3**	**16**	**13**	**150**	**180**	**0.14**	**0.93**	**13**	**2.1**	**0.29**	<0.35	**98**	**140**
DG-AD5	1	3.5-4	DG-AD5S-3.5-4	1/8/2019	**0.49**	**12**	**47**	**0.2**	**0.063**	**35**	**5.2**	**10**	**11**	**0.02**	**0.38**	**27**	**0.65**	<0.11	<0.33	**25**	**28**
DG-AD6	1	0.5-1	DG-AD6S-0.5-1	12/20/2018	**1.4 J**	**3.5 U**	**75**	<0.11	**0.92**	**24**	**14**	**280**	**140**	**0.12**	**1.2 J**	**17**	<0.53	<0.18	**1.2 J**	**82**	**190**
DG-AD6	1	3.5-4	DG-AD6S-3.5-4	12/20/2018	**4.3 J-**	**10 J**	**210 J**	**0.19 J**	**0.86**	**19 J**	**4.7 J**	**63 J**	**250 J**	**0.098**	**0.39 J**	**21 J**	**0.83 J**	**0.63 J**	<0.47	**26 J**	**240**
DG-AD7	1	0.5-1	DG-AD7S-0.5-1	12/19/2018	**5.7**	**10**	**120**	<0.11	**4.2**	**64**	**15**	**470**	**480**	**0.72**	**7.3**	**77**	**1.4 J**	**0.19 J**	<0.49	**64**	**970**
DG-AD7	1	3.5-4	DG-AD7S-3.5-4	12/19/2018	**0.76 J**	**5.2**	**76**	<0.085	**0.14 J**	**21**	**6.2**	**24**	**55**	**0.048**	**0.43 J**	**24**	<0.39	<0.13	<0.38	**34**	**74**
DG-AD8	1	0.5-1	DG-AD8S-0.5-1	1/31/2019	**30**	**14**	**1,200**	**0.73**	**2.6**	**29 J**	**5.7**	**510**	**4,500**	**0.73**	**1.1 J**	**26**	**1.2 J**	**3.8**	**11**	**28**	**2,100**
DG-AD8	1	3.5-4	DG-AD8S-3.5-4	1/31/2019	**4.0**	**7.9**	**84**	<0.13 U	**2.1**	**79**	**11**	**200**	**270**	**0.11**	**1.9 J**	**55**	**2.0 J**	**0.45 J**	<0.57 U	**62**	**370**
DG-AD9	1	0.5-1	DG-AD9S-0.5-1	1/9/2019	**40**	**14**	**140**	**0.27**	**3.3**	**52**	**11**	**400**	**460**	**0.8**	**7.9**	**41**	**2.9**	**0.55**	<1.2	**38**	**820**
DG-AD9	1	3.5-4	DG-AD9S-3.5-4	1/9/2019	**59**	**16**	**910**	**0.48**	**2.0**	**25**	**6.7**	**950**	**3,200**	**0.88**	**1.8**	**32**	**2.4**	**3.7**	<0.44	**32**	**1,500**
DG-AE2	1	0.5-1	DG-AE2S-0.5-1	12/14/2018	**4.7**	**18**	**130**	<0.13	**1.1**	**20**	**9.2**	**260**	**330**	**0.27**	**1.5 J**	**48**	<0.58	**0.20 J**	<0.56	**64**	**250**
DG-AE2	1	3.5-4	DG-AE2S-3.5-4	12/14/2018	**1.9**	**7.4**	**70**	**0.14 J**	<0.026	**92**	**12**	**30**	**3.2**	**2.2**	<0.13	**110**	**0.37 J**	<0.10	<0.30	**45**	**39**
DG-AE3	1	0.5-1	DG-AE3S-0.5-1	12/19/2018	<0.26	**1.2 J**	**31**	**0.11 J**	**0.053 J**	**9.3**	**11**	**120**	**2.3**	**0.027**	**0.46 J**	**4.1**	**0.61 J**	<0.16	<0.46	**110**	**39**
DG-AE3	1	3.5-4	DG-AE3S-3.5-4	12/19/2018	**1.6 J**	**71**	**130**	<0.12	**0.38 J**	**92**	**16**	**57**	**91**	**1.2**	**0.67 J**	**110**	<0.55	<0.19	<0.53	**62**	**120**
DG-AE4	1	0.5-1	DG-AE4S-0.5-1	12/18/2018	**8.4**	**190**	**190**	<0.094	**2.1**	**38**	**8.6**	**260**	**780**	**0.46**	**2.3**	**33**	**0.86 J**	**0.89**	<0.42	**54**	**900**
DG-AE4	1	3.5-4	DG-AE4S-3.5-4	12/18/2018	**1.6**	**81**	**66**	**0.26**	**0.18 J**	**46**	**6.6**	**8.9**	**5.7**	**0.016**	**0.53 J**	**36**	**0.38 J**	**0.12 J**	<0.31	**30**	**30**
DG-AE5	1	0.5-1	DG-AE5S-0.5-1	12/17/2018	**14**	**23**	**130**	<0.11	**3.6**	**890**	**16**	**420**	**640**	**1.0**	**40**	**460**	<0.50	**1.3**	<0.48	**54**	**1,300**
DG-AE5	1	3.5-4	DG-AE5S-3.5-4	12/17/2018	**17**	**1,400**	**150**	**0.11 J**	**0.79**	**24**	**10**	**230**	**520**	**0.21**	**0.50 J**	**31**	<0.35	**1.0**	**1.5**	**50**	**540**
DG-AE6	1	0.5-1	DG-AE6S-0.5-1	12/20/2018	**4.6**	**4.3**	**92**	<0.10	**1.4**	**33**	**11**	**220**	**180**	**0.24**	**3.3**	**32**	<0.47	<0.16	**0.70 J**	**56**	**290**
DG-AE6	1	3.5-4	DG-AE6S-3.5-4	12/20/2018	**2.2 J**	**6.2 J**	**170**	**0.23 J**	**1.1 J**	**20**	**6.9**	**53**	**270 J**	**0.84 J**	**0.26 J**	**22**	<0.47	**0.39 J**	<0.46	**29**	**430**
DG-AE6 (D)	1	3.5-4	DG-AE6 (D)S-3.5-4	12/20/2018	**4.8 J**	**12 J**	**210**	**0.24 J**	**0.51 J**	**19**	**6.5**	**80**	**6,300 J**	**0.18 J**	**1.0 J**	**23**	<0.39	**0.79 J**	<0.38	**29**	**390**
DG-AE7	1	0.5-1	DG-AE7S-0.5-1	1/9/2019	**2.0**	**7.7**	**83**	**0.14**	**0.58**	**19**	**14**	**98**	**100**	**0.061**	**0.91**	**32**	**1.8**	<0.14	<0.40	**76**	**300**
DG-AE7	1	3.5-4	DG-AE7S-3.5-4	1/9/2019	**3.2**	**8.8**	**130**	**0.16**	**0.2**	**15**	**5.7**	**47**	**220**	**0.033**	**0.79**	**15**	**1.1**	<0.14	<0.40	**35**	**120**
DG-AE7	1	8-8.5	DG-AE7S-8-8.5	1/9/2019	**2.2**	**12**	**60**	**0.94**	**0.12**	**38**	**22**	**55**	**29**	**0.1**	**0.73**	**65**	**1.8**	<0.19	<0.54	**49**	**120**
DG-AE8	1	0.5-1	DG-AE8S-0.5-1	1/31/2019	**4.3**	**9.3**	**85**	<0.085 U	**2.6**	**53**	**11**	**230**	**320**	**0.25**	**4.1**	**64**	**1.9 J**	**0.42 J**	**0.85 J**	**48**	**490**
DG-AE8	1	3.5-4	DG-AE8S-3.5-4	1/31/2019	**0.57 J**	**3.6 J**	**57**	<0.13 U	**0.071 J**	**23**	**6.7**	**28**	**45**	**0.021**	<0.25 U	**22**	<0.58 U	<0.20 U	<0.56 U	**41**	**51**
DG-AF10	1	0.5-1	DG-AF10S-0.5-1	1/15/2019	**0.64 J**	**2.3 J**	**69**	<0.13	**0.46 J**	**13**	**9.4**	**130**	**130**	**0.1**	**0.67 J**	**5.9**	<0.59	<0.20	<0.57	**89**	**170**
DG-AF10	1	3.5-4	DG-AF10S-3.5-4	1/15/2019	**0.76 J**	**3.8**	**220**	**0.16 J**	**2.1**	**75**	**12**	**34**	**120**	**0.082**	**0.90 J**	**38**	<0.49	<0.17	<0.48	**62**	**940**
DG-AF2	1	0.5-1	DG-AF2S-0.5-1	12/14/2018	**3.8 J**	**16**	**190 J**	<0.087	**1.0 J**	**23**	**8.4**	**170**	**520 J**	**0.27**	**2.6 J**	**29**	**0.83 J**	**0.28 J**	<0.39	**46**	**290 J**
DG-AF2	1	3.5-4	DG-AF2S-3.5-4	12/14/2018	**1.1 J**	**8.3**	**79**	**0.35**	<0.039	**24**	**12**	**41**	**16**	**1.2**	<0.20	**41**	**0.57 J**	**0.20 J**	<0.46	**26**	**85**
DG-AF2 (D)	1	0.5-1	DG-AF2 (D)S-0.5-1	12/14/2018	**1.7 J**	**12**	**110 J**	<0.098	**0.45 J**	**17**	**9.1**	**140**	**220 J**	**0.19**	**1.4 J**	**20**	<0.45 UJ	<0.15 UJ	<0.44	**66**	**160 J**
DG-AF3	1	0.5-1	DG-AF3S-0.5-1	12/14/2018	**1.8 U**	**8.5**	**27**	<0.12	<0.044	**8.5**	**14**	**120**	**18**	**0.052**	**0.52 J**	**6.0**	<0.53	<0.18	<0.51	**120**	**60**
DG-AF3	1	3.5-4	DG-AF3S-3.5-4	12/14/2018	**1.1**	**13**	**140**	**0.38**	**0.15 J**	**34**	**16**	**60**	**32**	**0.13**	**0.91 J**	**51**	**0.83 J**	<0.11	<0.31	**37**	**120**
DG-AF4	1	0.5-1	DG-AF4S-0.5-1	12/18/2018	**3.5**	**25**	**73**	**0.25**	**1.4**	**22**	**6.0**	**170**	**260**	**0.19**	**5.8**	**17**	**0.37 J**	**0.6**	<0.31	**43**	**330**
DG-AF4	1	3.5-4	DG-AF4S-3.5-4	12/18/2018	**1.1 J**	**31**	**98**	<0.12	**0.27 J**	**35**	**5.3**	**26**	**81**	**0.033**	**0.33 J**	**28**	<0.55	**0.37 J**	<0.53	**27**	**100**
DG-AF5	1	0.5-1	DG-AF5S-0.5-1	1/8/2019	**13**	**20**	**160**	<0.076	**5.5**	**78**	**13**	**550**	**700**	**0.68**	**9.7**	**83**	**4.7**	**1.7**	<0.34	**47**	**1,200**
DG-AF5	1	3.5-4	DG-AF5S-3.5-4	1/8/2019	**1.7**	**120**	**40**	**0.14**	**0.07**	**28**	**4.9**	**16**	**19**	**0.044**	<0.16	**28**	**0.56**	<0.13	<0.36	**18**	**40**
DG-AF6	1	0.5-1	DG-AF6S-0.5-1	12/20/2018	**1.4 J**	**3.8 U**	**17 J+**	<0.12	**0.47 U**	**20**	**20**	**120**	**28**	**0.11**	**0.25 J**	**11**	<0.57	<0.19	**0.68 J**	**150**	**110**
DG-AF6	1	3.5-4	DG-AF6S-3.5-4	12/20/2018	**25**	**18**	**160**	<0.098	**0.83**	**22**	**5.9**	**420**	**810**	**0.19**	**0.51 J**	**62**	<0.45	<0.15	<0.44	**55**	**340**
DG-AF7	1	0.5-1	DG-AF7S-0.5-1	12/19/2018	**22**	**19**	**360**	**0.15 J**	**8.3**	**780**	**16**	**650**	**1,800**	**0.93**	**13**	**78**	<0.94	**7.1**	<0.91	**59**	**1,700**
DG-AF7	1	3.5-4	DG-AF7S-3.5-4	12/19/2018	**0.82 J**	**3.9**	**93**	**0.48**	**0.54**	**21**	**7.4**	**44**	**35**	**0.028**	**0.70 J**	**17**	<0.37	<0.13	<0.36	**52**	**58**
DG-AF8	1	0.5-1	DG-AF8S-0.5-1	1/31/2019	**4.4**	**11**	**81**	**0.31 U**	**1.5**	**31**	**6.2**	**140**	**290**	**0.15**	**1.5**	**41**	**3.1 U**	**0.77 U**	<0.45 U	**23**	**270**

Table 2: Metals Concentrations in Soil
Brisbane Baylands OU-2
Brisbane, California

Sample Location	Investigation Zone	Depth Range (ft bgs)	Sample Name	Collection Date	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
Direct Exposure Human Health Risk Level Residential Soil Exposure ESL [1]					1.1E+01	6.7E-02	1.5E+04	1.6E+01	7.8E+01	1.2E+05	2.3E+01	3.1E+03	8.0E+01	1.3E+01	3.9E+02	8.2E+02	3.9E+02	3.9E+02	7.8E-01	3.9E+02	2.3E+04
Regional Background [2]					5.5E+00	1.9E+01	3.2E+02	1.0E+00	2.7E+00	1.0E+02	2.5E+01	6.9E+01	1.6E+01	4.0E-01	7.4E+00	1.2E+02	5.6E+00	1.8E+00	7.6E+00	7.4E+01	1.1E+02
Units					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
DG-AF8	1	3.5-4	DG-AF8S-3.5-4	1/31/2019	**8.3**	**6.2**	**540**	**0.43**	**1.7**	**21**	**4.9**	**1,900**	**970**	**0.12**	<0.18 U	**23**	**2.7 U**	**2.2**	<0.40 U	**28**	**1,500**
DG-AG10	1	0.5-1	DG-AG10S-0.5-1	1/15/2019	**2.8**	**6.6**	**99**	<0.12	**1.6**	**17**	**5.8**	**160**	**470**	**0.27**	**1.1 J**	**14**	<0.54	<0.18	<0.52	**52**	**1,200**
DG-AG10	1	3.5-4	DG-AG10S-3.5-4	1/15/2019	**2.5 J**	**10 J**	**180 J**	**0.21 J**	**2.1**	**68**	**11**	**100**	**1000**	**0.11 J**	**0.66 J**	**48**	**1.1 J**	**0.13 J**	<0.35	**58**	**650 J**
DG-AG10 (D)	1	3.5-4	DG-AG10 (D)S-3.5-4	1/15/2019	**9.6 J**	**20 J**	**340 J**	**0.17 J**	**3.3**	**58**	**10**	**160**	**1500**	**0.23 J**	**0.72 J**	**39**	**1.6 J**	**0.15 J**	<0.37	**49**	**1,500 J**
DG-AG2	1	0.5-1	DG-AG2S-0.5-1	12/14/2018	**9.8**	**11**	**160**	<0.088	**2.4**	**31**	**8.9**	**270**	**350**	**0.52**	**1.9**	**33**	**0.99 J**	**0.86**	<0.39	**41**	**490**
DG-AG2	1	3.5-4	DG-AG2S-3.5-4	12/14/2018	**0.52 J**	**38**	**78**	**0.17 J**	**0.26 J**	**21**	**4.8**	**18**	**130**	**0.36**	**2.0**	**47**	<0.54	<0.18	<0.52	**49**	**53**
DG-AG2	1	4.5-5	DG-AG2S-4.5-5	12/14/2018	**1.1 J**	**14**	**25**	**0.4**	**0.21 J**	**29**	**14**	**21**	**17**	**0.037**	**0.64 J**	**25**	<0.50	<0.17	<0.48	**37**	**79**
DG-AG3	1	0.5-1	DG-AG3S-0.5-1	12/19/2018	**0.31 J**	**6.7**	**39**	<0.082	**0.14 J**	**8.5**	**11**	**95**	**20**	**0.085**	**0.53 J**	**6.1**	<0.38	<0.13	<0.36	**92**	**65**
DG-AG3	1	3.5-4	DG-AG3S-3.5-4	12/19/2018	**0.98 J**	**30**	**150**	**0.51**	**0.29 J**	**120**	**20**	**41**	**25**	**1.0**	**0.96 J**	**160**	**0.65 J**	<0.16	<0.45	**81**	**70**
DG-AG4	1	0.5-1	DG-AG4S-0.5-1	12/18/2018	**0.45 J**	**1.1 J**	**36 J**	**0.17 J**	**0.22 J**	**7.1 J**	**7.3 J**	**130 J**	**10 J**	**0.1**	**0.38 J**	**2.4 J**	<0.47 U	<0.16 U	<0.45 U	**79 J**	**44 J**
DG-AG4	1	11-11.5	DG-AG4S-11-11.5	12/18/2018	**1.4**	**11**	**53**	**0.46**	**0.20 J**	**49**	**19**	**25**	**11**	**0.031**	**2.2**	**43**	<0.33	<0.11	<0.32	**56**	**67**
DG-AG4	1	3.5-4	DG-AG4S-3.5-4	12/18/2018	**1.5 J**	**16**	**100 J**	**0.18 J**	**0.28 J**	**60 J**	**7.5 J**	**13**	**15**	**0.063**	**0.43 J**	**46 J**	<0.58	<0.19	<0.56	**40 J**	**47 J**
DG-AG4 (D)	1	3.5-4	DG-AG4 (D)S-3.5-4	12/18/2018	**0.58 J**	**11**	**40 J**	**0.13 J**	**0.14 J**	**27 J**	**3.7 J**	**9.7**	**14**	**0.047**	**0.19 J**	**19 J**	<0.33	<0.11	<0.32	**19 J**	**24 J**
DG-AG5	1	0.5-1	DG-AG5S-0.5-1	12/17/2018	**5.1**	**84**	**100**	<0.092	**0.87**	**20**	**10**	**160**	**230**	**0.31**	**0.91 J**	**20**	<0.43	**0.60 J**	<0.41	**74**	**250**
DG-AG5	1	3.5-4	DG-AG5S-3.5-4	12/17/2018	**3.0**	**220 J**	**64 J**	<0.069	**0.085 J**	**17**	**12**	**110 J**	**120 J**	**0.12**	**0.41 J**	**21**	<0.32	**0.35 J**	<0.31	**81**	**91 J**
DG-AG5 (D)	1	3.5-4	DG-AG5 (D)S-3.5-4	12/17/2018	**2.9**	**69 J**	**110 J**	<0.086	**0.80 J**	**24**	**11**	**220 J**	**310 J**	**0.2**	**0.66 J**	**24**	<0.40	**0.66 J**	<0.38	**79**	**280 J**
DG-AG6	1	0.5-1	DG-AG6S-0.5-1	12/20/2018	**1.2 J**	**2.8 U**	**17 J**	**0.095 J**	**0.56**	**20 J**	**16 J**	**130 J**	**48 J**	**0.083**	**0.58 J**	**13 J**	<0.43	<0.14	<0.41 UJ	**100 J**	**150 J**
DG-AG6	1	3.5-4	DG-AG6S-3.5-4	12/20/2018	**1.7**	**5.2**	**98**	**0.11 J**	**0.32 U**	**21**	**6.5**	**38**	**120**	**0.087**	**0.19 J**	**23**	<0.39	<0.13	<0.38	**35**	**100**
DG-AG7	1	0.5-1	DG-AG7S-0.5-1	1/30/2019	**0.47 J**	**2.4 J**	**67**	**0.38**	**0.78**	**20**	**12**	**160**	**100**	**0.31**	**0.72 J**	**14**	<0.41	<0.14	<0.40	**92**	**500**
DG-AG7	1	3.5-4	DG-AG7S-3.5-4	1/30/2019	<0.18	**10**	**85**	**0.17 J**	**0.41**	**20**	**4.9**	**45**	**85**	**0.043**	<0.14	**16**	**2.2 U**	**0.12 J**	<0.31	**32**	**110**
DG-AG8	1	0.5-1	DG-AG8S-0.5-1	1/31/2019	**1.2 U**	**2.4 U**	**51**	**0.26**	**0.12 J**	**16**	**8.2**	**53**	**6.2**	**0.085**	<0.15 U	**20**	**2.4 U**	<0.12 U	<0.35 U	**50**	**39**
DG-AG8	1	3.5-4	DG-AG8S-3.5-4	1/31/2019	**1.3 U**	**2.7**	**67**	**0.32**	**0.15 J**	**9.5**	**5.6**	**13**	**8.4**	**0.016**	<0.17 U	**9.3**	**2.6 U**	<0.13 U	<0.38 U	**53**	**35**
DG-AH2	1	0.5-1	DG-AH2S-0.5-1	12/14/2018	**3.9**	**8**	**84**	<0.12	**2.2**	**30**	**12**	**230**	**190**	**0.21**	**2.3**	**23**	<0.55	<0.19	<0.53	**110**	**420**
DG-AH2	1	3.5-4	DG-AH2S-3.5-4	12/14/2018	**0.41 J**	**21**	**86**	**0.24 J**	**0.13 J**	**30 J**	**8.6 J**	**13 J**	**14**	**0.11 J**	**0.32 J**	**40 J**	<0.46	<0.15	<0.44	**22 J**	**48**
DG-AH2 (D)	1	3.5-4	DG-AH2 (D)S-3.5-4	12/14/2018	<0.32 UJ	**30**	**96**	<0.13 UJ	**0.16 J**	**81 J**	**15 J**	**22 J**	**16**	**0.56 J**	**0.40 J**	**91 J**	<0.58	<0.20	<0.56	**53 J**	**62**
DG-AH3	1	0.5-1	DG-AH3S-0.5-1	12/14/2018	**1.2 U**	**6.7**	**68**	<0.080	**0.10 J**	**16**	**11**	**150**	**52**	**0.1**	**0.75 J**	**8.0**	**1.3 J**	<0.12	<0.36	**120**	**84**
DG-AH3	1	3.5-4	DG-AH3S-3.5-4	12/14/2018	**2.1**	**170**	**62**	**0.26 U**	**0.42**	**11**	**11**	**260**	**160**	**0.17**	**0.69 J**	**23**	**0.84 J**	<0.13	<0.37	**77**	**140**
DG-AH4	1	0.5-1	DG-AH4S-0.5-1	12/18/2018	**0.82 J**	**7.7**	**83**	<0.12	**1.1**	**17**	**9.8**	**110**	**93**	**0.085**	**1.1 J**	**21**	<0.54	<0.18	<0.52	**76**	**220**
DG-AH4	1	3.5-4	DG-AH4S-3.5-4	12/18/2018	<0.33	**29**	**36**	<0.13	**0.11 J**	**14**	**9.4**	**170**	**2.3**	**0.058**	**0.34 J**	**7.2**	<0.59	<0.20	<0.57	**100**	**50**
DG-AH4	1	6-6.5	DG-AH4S-6-6.5	12/18/2018	**0.54 J**	**12**	**27**	**0.18 J**	**0.11 J**	**35**	**10**	**22**	**11**	**0.044**	**0.88 J**	**24**	<0.48	<0.16	<0.47	**53**	**55**
DG-AH5	1	0.5-1	DG-AH5S-0.5-1	1/8/2019	**2.0**	**56**	**59**	<0.087	**0.37**	**16**	**9.8**	**120**	**180**	**0.081**	**0.27**	**19**	**1.8**	**0.24**	**1.0**	**78**	**130**
DG-AH5	1	3.5-4	DG-AH5S-3.5-4	1/8/2019	**6.4**	**310**	**71**	**0.14**	**0.76**	**21**	**11**	**200**	**280**	**0.21**	**0.74**	**27**	**3.1**	**0.68**	<0.37	**64**	**260**
DG-AH5	1	8-8.5	DG-AH5S-8-8.5	1/8/2019	**2.1**	**6.0**	**75**	**0.12**	<0.046	**45**	**11**	**24**	**12**	**0.035**	<0.24	**72**	**1.4**	<0.19	<0.54	**27**	**52**
DG-AH6	1	0.5-1	DG-AH6S-0.5-1	12/20/2018	**6.7**	**14**	**140**	<0.072	**6.0**	**67**	**13**	**370**	**450**	**0.49**	**5.2**	**68**	**0.49 J**	**0.66**	**0.44 J**	**59**	**1,300**
DG-AH6	1	3.5-4	DG-AH6S-3.5-4	12/20/2018	**1.2**	**4.1**	**25**	<0.029	**0.26**	**9.0**	**2.6**	**44**	**77**	**0.49**	**0.45**	**8.8**	<0.13	<0.045	<0.13	**15**	**86**
DG-AH7	1	0.5-1	DG-AH7S-0.5-1	12/19/2018	**21**	**53**	**580**	**0.54**	**22**	**120**	**17**	**650**	**1,800**	**2.8**	**24**	**130**	**2.3 J**	**2.8 J**	<1.8	**39**	**2,500**
DG-AH7	1	3.5-4	DG-AH7S-3.5-4	12/19/2018	**0.60 J**	**3.7**	**74**	<0.12	**0.14 J**	**13**	**8.1**	**19**	**44**	**0.027**	**0.91 J**	**28**	<0.54	<0.18	<0.52	**35**	**45**
DG-N1	1	0.5-1	DG-N1S-0.5-1	12/18/2018	**2.5**	**28**	**56**	<0.095	**0.89**	**21**	**9.6**	**120**	**180**	**0.37**	**1.4 J**	**26**	**0.89 J**	**0.73 U**	<0.42	**65**	**300**
DG-N1	1	3.5-4	DG-N1S-3.5-4	12/18/2018	**8.2**	**39**	**110**	**0.25 J**	**0.30 J**	**320**	**24**	**21**	**5.8**	**9.4**	**0.43 J**	**330**	**1.0 J**	<0.15	<0.43	**67**	**54**
DG-N2	1	0.5-1	DG-N2S-0.5-1	12/13/2018	**1.5 U**	**180**	**130**	**0.16 J**	**0.062 J**	**130**	**23**	**42**	**12**	**0.38**	**0.98 J**	**160**	**1.5 J**	<0.16	<0.45	**87**	**96**
DG-N2	1	3.5-4	DG-N2S-3.5-4	12/13/2018	**3.7**	**180**	**68**	**0.13 J**	**0.67**	**23**	**12**	**130**	**170**	**0.25**	**1.3 J**	**25**	**1.5 J**	<0.17	<0.48	**86**	**140**
DG-N3	1	0.5-1	DG-N3S-0.5-1	12/13/2018	**1.8**	**28**	**51**	<0.086	**0.63**	**13**	**7.4**	**120**	**160**	**0.14**	**0.25 J**	**10**	<0.40	**0.24 J**	<0.38	**69**	**150**
DG-N3	1	3.5-4	DG-N3S-3.5-4	12/13/2018	**4.5**	**17**	**480**	**0.49**	**1.5**	**82**	**11**	**220**	**940**	**12**	**0.23 J**	**110**	<0.32	**1.7**	<0.31	**38**	**660**
DG-N4	1	0.5-1	DG-N4S-0.5-1	12/19/2018	**4.6**	**250**	**82**	<0.11	**1.0**	**24**	**12**	**380**	**370**	**0.25**	**1.1 J**	**26**	**2.6 J**	<0.17	<0.49	**79**	**310**
DG-N4	1	3.5-4	DG-N4S-3.5-4	12/19/2018	<0.26	**84**	**18**	<0.10	**0.078 J**	**28**	**4.5**	**6.9**	**3.7**	**0.021**	**0.27 J**	**23**	**1.2 J**	<0.16	<0.45	**20**	**17**
DG-N5	1	0.5-1	DG-N5S-0.5-1	1/8/2019	**2.2**	**9.1**	**99**	**0.11**	**0.85**	**36**	**11**	**110**	**150**	**0.19**	**1.2**	**37**	**2.3**	<0.13	**0.83**	**68**	**210**
DG-N5	1	3.5-4	DG-N5S-3.5-4	1/8/2019	**16**	**180**	**700**	<0.23	**1.1**	**41**	**8.9**	**760**	**1,700**	**0.72**	**1.0**	**39**	**7.0**	**2.3**	**1.3**	**24**	**1,600**
DG-N5 (D)	1	0.5-1	DG-N5 (D)S-0.5-1	1/8/2019	**1.3**	**62**	**56**	<0.073	**0.24**	**12**	**13**	**130**	**66**	**0.13**	**0.55**	**9.9**	**1.4**	**0.13**	**0.76**	**96**	**130**
DG-N5 (D)	1	0.5-1	DG-N5 (D)S-0.5-1	1/24/2019	**2.4**	**15**	**120**	**0.35 J**	**0.63**	**44**	**9.4**	**91**	**15 J**	**0.49 J**	<0.16 UJ	**49**	**3.0 J**	**0.59 J**	**2.9**	**36 J**	**160**
DG-O1	1	0.5-1	DG-O1S-0.5-1	12/13/2018	**1.2 J**	**28**	**48**	<0.10	**0.20 J**	**8.2**	**11**	**130**	**150**	**0.11**	<0.20	**8.9**	<0.47	**0.25 J**	<0.45	**91**	**100**
DG-O1	1	3.5-4	DG-O1S-3.5-4	12/13/2018	**2.2**	**3.7**	**140**	**0.25**	**0.086 J**	**120**	**18**	**30**	**4.7**	**0.66**	**1.6**	**160**	<0.30	**0.15 J**	<0.29	**57**	**49**
DG-O2	1	0.5-1	DG-O2S-0.5-1	12/13/2018	**1.6**	**28**	**51**	<0.094	**0.44**	**19**	**13**	**160**	**72**	**0.077**	**1.4**	**12**	**2.0 J**	<0.15	<0.42	**140**	**130**
DG-O2	1	3.5-4	DG-O2S-3.5-4	12/13/2018	**1.0 U**	**100**	**110**	**0.080 J**	<0.025	**130**	**17**	**27**	**5.9**	**1.4**	**0.52 J**	**130**	**0.72 J**	<0.10	<0.29	**66**	**50**

Table 2: Metals Concentrations in Soil
Brisbane Baylands OU-2
Brisbane, California

Sample Location	Investigation Zone	Depth Range (ft bgs)	Sample Name	Collection Date	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
Direct Exposure Human Health Risk Level Residential Soil Exposure ESL [1]					1.1E+01	6.7E-02	1.5E+04	1.6E+01	7.8E+01	1.2E+05	2.3E+01	3.1E+03	8.0E+01	1.3E+01	3.9E+02	8.2E+02	3.9E+02	3.9E+02	7.8E-01	3.9E+02	2.3E+04
Regional Background [2]					5.5E+00	1.9E+01	3.2E+02	1.0E+00	2.7E+00	1.0E+02	2.5E+01	6.9E+01	1.6E+01	4.0E-01	7.4E+00	1.2E+02	5.6E+00	1.8E+00	7.6E+00	7.4E+01	1.1E+02
Units					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
DG-O3	1	0.5-1	DG-O3S-0.5-1	12/18/2018	**0.58 J**	**37**	**23**	<0.089	**0.35**	**8.1**	**11**	**89**	**14**	**0.061**	**0.41 J**	**5.6**	**0.72 J**	<0.14	<0.40	**79**	**72**
DG-O3	1	3.5-4	DG-O3S-3.5-4	12/18/2018	**4.5**	**39**	**55**	**0.15 J**	**0.23 J**	**190**	**14**	**20**	**6.0**	**4.0**	**0.40 J**	**170**	**1.6 J**	**0.90 U**	<0.52	**43**	**50**
DG-O4	1	0.5-1	DG-O4S-0.5-1	12/19/2018	**0.42 J**	**3.3 J**	**47**	<0.12	**0.29 J**	**7.3**	**7.5**	**110**	**29**	**0.09**	**0.32 J**	**2.9**	**1.2 J**	<0.19	<0.55	**100**	**86**
DG-O4	1	3.5-4	DG-O4S-3.5-4	12/19/2018	**0.74 J**	**48**	**32**	<0.12	**0.11 J**	**31**	**4.9**	**15**	**34**	**0.024**	**0.45 J**	**21**	<0.55	<0.18	<0.53	**23**	**43**
DG-O5	1	0.5-1	DG-O5S-0.5-1	12/18/2018	**0.72 J**	**94**	**110**	<0.11	**0.18 J**	**15**	**12**	**190**	**86**	**0.11**	**0.25 J**	**7.5**	<0.52	**0.19 J**	<0.50	**130**	**160**
DG-O5	1	3.5-4	DG-O5S-3.5-4	12/18/2018	**2.0**	**410**	**110**	**0.26 J**	<0.049	**51**	**6.8**	**26**	**29**	**0.034**	**0.26 J**	**39**	<0.59	<0.20	<0.57	**32**	**65**
DG-O6	1	0.5-1	DG-O6S-0.5-1	12/19/2018	**1.3 J**	**2.8 J**	**54**	**0.17 J**	**0.67**	**18**	**11**	**130 J**	**55**	**0.098**	**1.6**	**12**	**1.7 J**	<0.15	<0.43	**84**	**160 J**
DG-O6	1	3.5-4	DG-O6S-3.5-4	12/19/2018	**12 J**	**11 J**	**250 J**	**0.25 J**	**1.1**	**14 J**	**4.1 J**	**190**	**780 J**	**0.93**	**0.35 J**	**14 J**	**1.4 J**	**1.1 J**	**1.2 J**	**19 J**	**740 J**
DG-O6 (D)	1	0.5-1	DG-O6 (D)S-0.5-1	12/19/2018	**1.8 J**	**3.6 J**	**56**	<0.12 UJ	**0.92**	**19**	**14**	**250 J**	**71**	**0.11**	**1.9**	**12**	**2.0 J**	<0.18	<0.51	**110**	**750 J**
DG-P1	1	0.5-1	DG-P1S-0.5-1	11/21/2018	**0.69 J**	**42**	**53**	<0.11	**0.10 J**	**23**	**10**	**81**	**59**	**0.07**	<0.21	**14**	<0.50	**0.83 U**	<0.48	**92**	**66**
DG-P1	1	3.5-4	DG-P1S-3.5-4	11/21/2018	**2.6**	**55**	**92**	**0.16 J**	**0.085 J**	**120**	**17**	**31**	**4.5**	**12**	<0.26	**140**	<0.60	**1.0 U**	<0.58	**70**	**49**
DG-P1 (D)	1	3.5-4	DG-P1 (D)S-3.5-4	11/21/2018	**2.9**	**56**	**100**	**0.12 J**	**0.069 J**	**130**	**17**	**27**	**7.0**	**19**	<0.22	**140**	<0.52	**0.86 U**	<0.50	**79**	**52**
DG-P2	1	0.5-1	DG-P2S-0.5-1	12/13/2018	**2.0**	**170**	**37**	<0.093	**0.13 J**	**8.3**	**13**	**130**	**46 J**	**0.088**	**0.65 J**	**6.7 J**	**0.56 J**	<0.14	<0.41	**140**	**90 J**
DG-P2	1	3.5-4	DG-P2S-3.5-4	12/13/2018	**2.0 U**	**78**	**350**	**0.91**	**0.098 J**	**42**	**18**	**50**	**24**	**0.074**	**0.83 J**	**56**	**0.98 J**	<0.20	<0.57	**37**	**110**
DG-P2 (D)	1	0.5-1	DG-P2 (D)S-0.5-1	12/13/2018	**2.8**	**260**	**45**	<0.12	**0.26 J**	**10**	**12**	**130**	**120 J**	**0.074**	**0.60 J**	**12 J**	**1.1 J**	<0.19	<0.53	**120**	**180 J**
DG-P3	1	0.5-1	DG-P3S-0.5-1	12/13/2018	**4.0**	**250**	**160**	<0.10	**2.3**	**25**	**7.1**	**120**	**380**	**0.51**	**0.35 J**	**31**	**0.66 J**	**0.46 J**	**0.60 J**	**27**	**320**
DG-P3	1	3.5-4	DG-P3S-3.5-4	12/13/2018	**1.9**	**140**	**64**	**0.32**	**0.072 J**	**47**	**14**	**36**	**20**	**0.77**	<0.18	**66**	<0.43	<0.15	<0.42	**52**	**61**
DG-P4	1	0.5-1	DG-P4S-0.5-1	12/19/2018	**6.8**	**630**	**220**	<0.13	**2.5**	**37**	**9.1**	**190**	**610**	**0.31**	**1.0 J**	**41**	**2.1 J**	**0.58 J**	**1.7 J**	**41**	**500**
DG-P4	1	3.5-4	DG-P4S-3.5-4	12/19/2018	**0.98 J**	**68**	**46**	**0.25 J**	**0.32 J**	**42**	**6.1**	**20**	**21**	**0.033**	**0.40 J**	**34**	**1.3 J**	<0.15	<0.42	**30**	**52**
DG-P5	1	0.5-1	DG-P5S-0.5-1	1/8/2019	**2.1**	**42**	**68**	<0.092	**1.1**	**24**	**14**	**180**	**190**	**0.12**	**1.3**	**20**	**2.9**	**0.26**	<0.41	**100**	**220**
DG-P5	1	3.5-4	DG-P5S-3.5-4	1/8/2019	**1.4**	**150**	**100**	**0.41**	**0.24**	**26**	**7.2**	**35**	**170**	**0.21**	**0.19**	**34**	**1.1**	**0.18**	**0.67**	**26**	**120**
DG-P6	1	0.5-1	DG-P6S-0.5-1	12/19/2018	**7.1**	**21**	**450**	**0.17 J**	**1.3**	**20**	**7.7**	**300**	**750**	**0.25**	**0.53 J**	**21**	**0.85 J**	**2.0**	<0.45	**55**	**630**
DG-P6	1	3.5-4	DG-P6S-3.5-4	12/19/2018	**28**	**19**	**940**	**0.55**	**3.1**	**30**	**7.7**	**540**	**2,400**	**0.25**	**0.53 J**	**43**	**3.7 J**	**3.7**	**2.1 J**	**27**	**1,700**
DG-Q1	1	0.5-1	DG-Q1S-0.5-1	12/13/2018	**1.7 J**	**79**	**87**	<0.12	**0.61**	**25**	**9.9**	**100**	**120**	**0.37**	**1.2 J**	**28**	**0.58 J**	<0.19	<0.55	**79**	**210**
DG-Q1	1	3.5-4	DG-Q1S-3.5-4	12/13/2018	**2.4**	**8.7**	**130**	**0.24**	**0.11 J**	**130**	**18**	**29**	**4.1**	**0.54**	<0.15	**160**	<0.36	**0.21 J**	<0.35	**67**	**52**
DG-Q2	1	0.5-1	DG-Q2S-0.5-1	12/13/2018	**5.3**	**46**	**79**	**0.15 J**	**0.56**	**18**	**9.4**	**150**	**2,200**	**0.21**	**0.90 J**	**33**	**1.5 J**	<0.19	<0.55	**43**	**140**
DG-Q2	1	3.5-4	DG-Q2S-3.5-4	12/13/2018	**3.5**	**140**	**59**	<0.12	<0.047	**68**	**9.5**	**16**	**22**	**0.33**	**0.26 J**	**53**	**0.70 J**	<0.19	<0.55	**58**	**34**
DG-Q3	1	0.5-1	DG-Q3S-0.5-1	12/18/2018	**0.68 J**	**86**	**42**	<0.080	**0.23 J**	**7.6**	**11**	**85**	**30**	**0.046**	**0.39 J**	**4.6**	**0.53 J**	<0.12	<0.36	**81**	**50**
DG-Q3	1	3.5-4	DG-Q3S-3.5-4	12/18/2018	**1.6**	**2.5**	**23**	**0.17 J**	**0.18 J**	**45**	**7.9**	**6.2**	**2.6**	**0.015 U**	**0.34 J**	**32**	**0.72 J**	<0.10	<0.29	**39**	**23**
DG-Q4	1	0.5-1	DG-Q4S-0.5-1	12/19/2018	**0.99 J**	**16 J**	**61**	<0.11	**0.61**	**14 J+**	**8.7 J**	**77 J+**	**150 J**	**0.06**	**0.69 J**	**13**	**1.1 J**	<0.18	<0.50	**53 J+**	**170 J**
DG-Q4	1	3.5-4	DG-Q4S-3.5-4	12/19/2018	**0.57 J**	**13 J**	**81**	**0.14 J**	**0.41 J**	**38**	**5.5**	**86 J**	**140**	**1.4 J**	**0.51 J**	**29**	**1.1 J**	<0.18	<0.51	**27**	**210**
DG-Q4 (D)	1	3.5-4	DG-Q4 (D)S-3.5-4	12/19/2018	**0.60 J**	**22 J**	**93**	**0.18 J**	**0.55 J**	**39**	**5.1**	**31 J**	**120**	**0.055 J**	**0.38 J**	**30**	**0.50 J**	<0.15	<0.43	**25**	**310**
DG-Q5	1	0.5-1	DG-Q5S-0.5-1	12/18/2018	**2.7**	**48**	**130**	**0.15 J**	**1.8**	**25**	**12**	**240**	**340**	**0.26**	**1.1 J**	**23**	<0.50	**0.67 J**	<0.48	**98**	**580**
DG-Q5	1	3.5-4	DG-Q5S-3.5-4	12/18/2018	**2.7**	**140**	**160**	**0.15 J**	**0.30 J**	**56**	**12**	**77**	**150**	**0.24**	<0.23	**74**	<0.53	**0.38 J**	<0.51	**37**	**170**
DG-Q6	1	0.5-1	DG-Q6S-0.5-1	12/19/2018	**1.0 J**	**2.7**	**67**	<0.080	**0.13 J**	**24**	**7.3**	**100**	**110**	**0.11**	**0.36 J**	**22**	**0.55 J**	**0.12 J**	<0.36	**64**	**89**
DG-Q6	1	3.5-4	DG-Q6S-3.5-4	12/19/2018	**26**	**47**	**1,200**	**0.49 J**	**3.6**	**52**	**13**	**1,400**	**4,200**	**0.61**	**2.7 J**	**47**	**2.8 J**	**7.3**	**1.8 J**	**37**	**2,500**
DG-Q7	1	0.5-1	DG-Q7S-0.5-1	1/8/2019	**6.7**	**15**	**150**	**0.11**	**3.8**	**42**	**9.3**	**270**	**760**	**0.35**	**3.8**	**42**	**1.8**	**0.57**	**0.59**	**40**	**570**
DG-Q7	1	3.5-4	DG-Q7S-3.5-4	1/8/2019	**18**	**12**	**51**	<0.12	**1.7**	**17**	**4.5**	**210**	**940**	**0.27**	**0.39**	**13**	**2.0**	**0.42**	<0.53	**27**	**900**
DG-Q7 (D)	1	3.5-4	DG-Q7 (D)S-3.5-4	1/8/2019	**8.6**	**11**	**130**	**0.092**	**2.4**	**49**	**8.6**	**210**	**390**	**0.26**	**3.2**	**66**	**1.6**	**0.39**	<0.36	**35**	**410**
DG-R1	1	0.5-1	DG-R1S-0.5-1	12/17/2018	**3.5**	**320**	**90**	**0.11 J**	**1.6**	**42**	**14**	**150**	**200**	**0.49**	**1.8**	**49**	**1.4 J**	**0.72 U**	<0.42	**73**	**270**
DG-R1	1	3.5-4	DG-R1S-3.5-4	12/17/2018	**1.5 J**	**49**	**59**	**0.69**	**0.32 J**	**46**	**15**	**35**	**16**	**0.19**	**0.37 J**	**46**	**0.63 J**	<0.20	<0.57	**44**	**72**
DG-R2	1	0.5-1	DG-R2S-0.5-1	12/13/2018	**5.7**	**210**	**110**	<0.10	**0.43**	**86**	**16**	**130**	**150**	**0.98**	**0.85 J**	**98**	**1.4 J**	<0.16	<0.45	**80**	**160**
DG-R2	1	3.5-4	DG-R2S-3.5-4	2/5/2019	**1.0 J**	**1.8 J**	**20**	**0.076 J**	<0.028	**23**	**3.1**	**4**	**1.1**	**0.016**	<0.15 UJ	**21**	**0.35 J**	<0.11	**0.4**	**19**	**11**
DG-R2 (D)	1	3.5-4	DG-R2 (D)S-3.5-4	2/5/2019	**0.93 J**	**1.8 J**	**23**	**0.081 J**	<0.028	**30**	**3.8**	**4.6**	**1.2**	**0.022**	**0.15 J**	**24**	**0.77 J**	<0.11	<0.33	**24**	**12**
DG-R3	1	0.5-1	DG-R3S-0.5-1	12/13/2018	**0.87 J**	**82**	**40**	<0.076	**0.26 J**	**10**	**11**	**630**	**52**	**0.069**	<0.15	**7.5**	<0.35	**0.44 J**	<0.34	**89**	**140**
DG-R3	1	3.5-4	DG-R3S-3.5-4	12/13/2018	**1.2**	**3.9**	**38**	**0.082 J**	<0.028	**58**	**6.1**	**9.3**	**1.4**	**0.023**	<0.14	**36**	**0.34 J**	**0.16 J**	<0.32	**44**	**22**
DG-R4	1	0.5-1	DG-R4S-0.5-1	12/19/2018	**1.7 J**	**22**	**57**	<0.12	**0.5**	**20**	**11**	**110**	**150**	**0.12**	**1.6 J**	**20**	**2.6 J**	<0.19	<0.54	**66**	**550**
DG-R4	1	3.5-4	DG-R4S-3.5-4	12/19/2018	**19**	**120**	**1,000**	**0.67 J**	**1.4**	**37**	**11**	**1,100**	**2,300**	**0.31**	**4.9**	**50**	<1.4	**4.2**	**1.9 J**	**38**	**1,600**
DG-R4	1	9.5-10	DG-R4S-9.5-10	12/19/2018	**1.6 J**	**30**	**53**	**0.5**	**0.31 J**	**52**	**13**	**84**	**18**	**0.033**	**1.1 J**	**64**	**0.62 J**	<0.19	<0.56	**56**	**180**
DG-R5	1	0.5-1	DG-R5S-0.5-1	1/29/2019	**1.2**	**53**	**99**	<0.080	**1**	**16**	**11**	**110**	**230**	**0.2**	**0.47 J**	**14**	**0.93 J**	**0.15 J**	<0.36 R	**78**	**310**
DG-R5	1	3.5-4	DG-R5S-3.5-4	1/29/2019	**2.0 J**	**170 J**	**75 J**	**0.095 J**	**0.63 J**	**28 J**	**8.1**	**65**	**370 J**	**0.077**	**0.18 J**	**43 J**	**0.54 J**	**0.32 J**	<0.31 R	**37 J**	**190 J**
DG-R5 (D)	1	3.5-4	DG-R5 (D)S-3.5-4	1/29/2019	**0.69 J**	**22 J**	**30 J**	<0.097	**0.21 J**	**7.3 J**	**7.9**	**96**	**53 J**	**0.089**	<0.19	**4.2 J**	<0.45 UJ	**0.15 J**	<0.43	**69 J**	**69 J**
DG-R6	1	0.5-1	DG-R6S-0.5-1	12/19/2018	**9.7**	**12**	**200**	**0.44**	**4**	**66**	**23**	**5,400**	**790**	**0.66**	**5.4**	**65**	**0.79 J**	**1.9**	<0.49	**58**	**980**

Table 2: Metals Concentrations in Soil
Brisbane Baylands OU-2
Brisbane, California

Sample Location	Investigation Zone	Depth Range (ft bgs)	Sample Name	Collection Date	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
Direct Exposure Human Health Risk Level Residential Soil Exposure ESL [1]					1.1E+01	6.7E-02	1.5E+04	1.6E+01	7.8E+01	1.2E+05	2.3E+01	3.1E+03	8.0E+01	1.3E+01	3.9E+02	8.2E+02	3.9E+02	3.9E+02	7.8E-01	3.9E+02	2.3E+04
Regional Background [2]					5.5E+00	1.9E+01	3.2E+02	1.0E+00	2.7E+00	1.0E+02	2.5E+01	6.9E+01	1.6E+01	4.0E-01	7.4E+00	1.2E+02	5.6E+00	1.8E+00	7.6E+00	7.4E+01	1.1E+02
Units					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
DG-R6	1	3.5-4	DG-R6S-3.5-4	12/19/2018	**4.3**	**9.6**	**260**	<0.13	**0.71**	**32**	**7.7**	**240**	**630**	**0.14**	<0.26	**18**	**1.0 J**	**1.1**	<0.58	**47**	**600**
DG-R7	1	0.5-1	DG-R7S-0.5-1	12/19/2018	**1.8**	**6.0**	**120**	**0.32**	**0.86**	**27**	**7.2**	**97**	**140**	**0.11**	**1.1 J**	**28**	**1.2 J**	<0.15	<0.43	**39**	**150**
DG-R7	1	3.5-4	DG-R7S-3.5-4	12/19/2018	**21**	**38**	**400**	**0.5**	**2.7**	**39**	**10**	**790**	**4,000**	**0.054**	**3.1**	**67**	**1.8 J**	**9.9**	<0.39	**23**	**1,300**
DG-R7	1	8-8.5	DG-R7S-8-8.5	12/19/2018	**38**	**24**	**670**	**0.31**	**2.6**	**34**	**8.4**	**630**	**3,800**	**0.15**	**3.6**	**33**	**2.0 J**	**3.8**	**0.98 J**	**25**	**1,900**
DG-S1	1	0.5-1	DG-S1S-0.5-1	12/13/2018	**0.59 J**	**18**	**41**	<0.10	<0.040	**11**	**9.5**	**93**	**53**	**0.24**	<0.21	**15**	<0.48	<0.16	<0.47	**72**	**84**
DG-S1	1	3.5-4	DG-S1S-3.5-4	12/13/2018	**2.4**	**35**	**91**	**0.65**	**0.075 J**	**76**	**16**	**55**	**17**	**0.22**	**0.27 J**	**64**	<0.51	<0.17	<0.49	**47**	**82**
DG-S2	1	0.5-1	DG-S2S-0.5-1	12/13/2018	**9.5**	**290**	**74**	<0.10	**0.5**	**18**	**9.2**	**260**	**390**	**0.16**	**1.1 J**	**20**	**1.4 J**	**0.51 J**	<0.45	**53**	**150**
DG-S2	1	3.5-4	DG-S2S-3.5-4	12/13/2018	<0.20	**2.7**	**66**	**0.45**	<0.030	**65**	**8.9**	**10**	**4.2**	**0.037**	**0.37 J**	**44**	**1.1 J**	<0.12	<0.35	**49**	**24**
DG-S3	1	0.5-1	DG-S3S-0.5-1	12/18/2018	**10**	**210**	**58**	<0.12	**0.98**	**12**	**12**	**170**	**290**	**0.11**	**0.63 J**	**24**	**0.99 J**	**0.91 U**	<0.53	**78**	**170**
DG-S3	1	3.5-4	DG-S3S-3.5-4	12/18/2018	**3.2**	**48**	**73**	**0.44**	**0.37 J**	**86**	**20**	**36**	**82**	**3.3**	**0.43 J**	**130**	**1.2 J**	<0.16	<0.46	**64**	**76**
DG-S4	1	0.5-1	DG-S4S-0.5-1	12/19/2018	**1.9**	**8.2**	**58**	<0.10	**0.73**	**29**	**8.5**	**100**	**130**	**0.048**	**1.6**	**28**	**1.7 J**	<0.16	<0.45	**44**	**130**
DG-S4	1	3.5-4	DG-S4S-3.5-4	12/19/2018	**17**	**320**	**620**	**1.0**	**1.4**	**35**	**11**	**460**	**2,000**	**0.31**	**8.4**	**39**	<1.2	**3.6**	**1.2 J**	**41**	**1,100**
DG-S5	1	0.5-1	DG-S5S-0.5-1	12/18/2018	**7.3**	**140**	**170**	<0.13	**4.0**	**33**	**15**	**230**	**4,200**	**0.15**	**2.0**	**29**	**1.3 J**	**9.2**	<0.56	**100**	**1,100**
DG-S5	1	3.5-4	DG-S5S-3.5-4	12/18/2018	**1.1**	**140**	**54**	**0.17 J**	**0.20 J**	**26**	**3.9**	**19**	**81**	**0.043**	**0.14 J**	**21**	<0.32	<0.11	<0.31	**19**	**140**
DG-S6	1	0.5-1	DG-S6S-0.5-1	12/19/2018	**8.9**	**23**	**300**	<0.27	**15**	**88**	**22**	**580**	**660**	**0.25**	**7.8**	**93**	**1.7 J**	**1.5 J**	<1.2	**120**	**780**
DG-S6	1	3.5-4	DG-S6S-3.5-4	12/19/2018	**9.4**	**11**	**360**	**0.14 J**	**0.39 J**	**14**	**4.1**	**260**	**1,500**	**0.19**	**0.33 J**	**15**	**0.99 J**	**2.3**	**0.80 J**	**11**	**620**
DG-S7	1	0.5-1	DG-S7S-0.5-1	1/8/2019	**3.3**	**8.8**	**150**	<0.075	**0.98**	**31**	**10**	**160**	**200**	**0.26**	**1.6**	**27**	**2.8**	**0.22**	**0.33**	**57**	**280**
DG-S7	1	3.5-4	DG-S7S-3.5-4	1/8/2019	**22**	**26**	**1,200**	<0.20	**2.2**	**75**	**9.1**	**2,200**	**3,600**	**0.23**	**0.7**	**40**	**5.9**	**4.6**	<0.91	**23**	**3,600**
DG-S8	1	0.5-1	DG-S8S-0.5-1	1/29/2019	<0.27	**0.51 J**	**32**	**0.23 J**	<0.040	**13**	**8.3**	**110**	**12**	**0.17**	**0.33 J**	**4.1**	<0.48	<0.16	<0.46 R	**75**	**36**
DG-S8	1	3.5-4	DG-S8S-3.5-4	1/29/2019	**0.76 J**	**3.7**	**30**	**0.19 J**	<0.034	**7.2**	**13**	**91**	**33**	**0.059**	**0.18 J**	**4.9**	**0.65 J**	**0.20 J**	<0.40 R	**81**	**54**
DG-S8 (D)	1	0.5-1	DG-S8 (D)S-0.5-1	1/29/2019	<0.31	**0.64 J**	**33**	**0.17 J**	<0.046	**12**	**8.2**	**120**	**15**	**0.11**	<0.24 UJ	**3.9**	<0.56	<0.19	<0.54 R	**70**	**38**
DG-T1	1	0.5-1	DG-T1S-0.5-1	12/17/2018	**2.0 J**	**100 J**	**73 J**	**0.13 J**	**0.84**	**29 J**	**12 J**	**84 J+**	**140 J**	**0.54 J**	**0.85 J**	**43 J**	**0.73 J**	**0.74 U**	<0.43	**73 J**	**190 J**
DG-T1	1	3.5-4	DG-T1S-3.5-4	12/17/2018	**1.4 J**	**24**	**70**	**0.18 J**	<0.030 UJ	**76**	**12**	**24**	**2.8 J**	**0.45**	<0.16 UJ	**89**	<0.37 UJ	<0.12	<0.36	**48**	**42**
DG-T1 (D)	1	3.5-4	DG-T1 (D)S-3.5-4	12/17/2018	**3.5 J**	**27**	**110**	**0.28 J**	**0.33 J**	**100**	**18**	**28**	**6.3 J**	**0.59**	**0.45 J**	**130**	**0.43 J**	<0.14	<0.41	**70**	**57**
DG-T2	1	0.5-1	DG-T2S-0.5-1	2/5/2019	**0.47 J**	**0.72 J**	**36**	**0.14 J**	<0.042	**45**	**5.3**	**5.6**	**3**	**0.16**	<0.22	**33**	**0.89 J**	<0.17	**0.74**	**28**	**17**
DG-T2	1	3.5-4	DG-T2S-3.5-4	12/13/2018	**1.0 U**	**3.5**	**130**	**0.12 J**	**0.030 J**	**100**	**35**	**11**	**4.4**	**0.031**	**0.60 J**	**83**	**1.2 J**	<0.10	<0.30	**70**	**28**
DG-T3	1	0.5-1	DG-T3S-0.5-1	12/14/2018	**3.6 J**	**120 J**	**71 J**	<0.096 U	**0.85**	**30 J**	**9.9 J**	**110 J**	**190 J**	**0.14**	**1.6 J**	**29 J**	**0.47 J**	<0.15 U	<0.43	**54 J**	**210 J**
DG-T3	1	3.5-4	DG-T3S-3.5-4	12/14/2018	**1.5**	**120**	**150**	**0.26**	<0.032	**86**	**22**	**99**	**44**	**1.8**	**1.2 J**	**130**	**1.2 J**	<0.13	<0.37	**71**	**73**
DG-T4	1	0.5-1	DG-T4S-0.5-1	12/19/2018	**5.5**	**15**	**64**	**0.37**	**1.6**	**30**	**11**	**1,300**	**280**	**0.25**	**2.0**	**30**	**1.8 J**	**3.4**	<0.53	**76**	**370**
DG-T4	1	3.5-4	DG-T4S-3.5-4	12/19/2018	**2.6**	**16**	**120**	**0.68**	**0.18 J**	**56**	**54**	**46**	**280**	**0.09**	**1.4 J**	**45**	**1.5 J**	<0.20	<0.57	**60**	**170**
DG-T5	1	0.5-1	DG-T5S-0.5-1	1/8/2019	**0.68**	**20**	**41**	<0.071	**0.057**	**6.7**	**8.7**	**89**	**150**	**0.13**	<0.14	**3.8**	**0.77**	**0.45**	<0.32	**77**	**72**
DG-T5	1	3.5-4	DG-T5S-3.5-4	1/8/2019	**1.2**	**24**	**46**	**0.22**	**0.12**	**29**	**4.6**	**15**	**14**	**0.037**	**0.15**	**21**	**1.0**	<0.11	<0.32	**21**	**40**
DG-T6	1	0.5-1	DG-T6S-0.5-1	12/19/2018	**0.85 J**	**5.4**	**71**	<0.10	**0.15 J**	**22**	**9.1**	**110**	**77**	**0.1**	**0.48 J**	**22**	<0.47	<0.16	<0.45	**72**	**82**
DG-T6	1	3.5-4	DG-T6S-3.5-4	12/19/2018	**32**	**33**	**1,600**	**0.61 J**	**5.7**	**46**	**7.7**	**900**	**4,200**	**0.38**	**1.6 J**	**42**	<1.2	**8.4**	<1.2	**36**	**3,700**
DG-T7	1	3.5-4	DG-T7S-3.5-4	12/19/2018	**2.7**	**6.5**	**220**	**0.17 J**	**0.57**	**21**	**6.3**	**86 J**	**420 J**	**0.14 J**	**0.72 J**	**21**	<0.45	**0.78 J**	<0.44	**34**	**390**
DG-T7 (D)	1	3.5-4	DG-T7 (D)S-3.5-4	12/19/2018	**2.7**	**7**	**250**	<0.12 UJ	**0.49**	**21**	**6.1**	**220 J**	**750 J**	**0.076 J**	**0.68 J**	**21**	<0.55	**0.29 J**	<0.53	**34**	**440**
DG-T8	1	0.5-1	DG-T8S-0.5-1	1/15/2019	**0.47 J**	**2.7**	**98**	**0.79**	**5.3**	**21**	**10**	**500**	**78**	**0.13**	**1.0 J**	**26**	**1.1 J**	<0.11	**0.39 J**	**85**	**1,400**
DG-T8	1	3.5-4	DG-T8S-3.5-4	1/15/2019	**13**	**28**	**200**	**0.82**	**0.53 J**	**31**	**17**	**470**	**990**	**0.23**	**2.3**	**69**	**4.1 J**	**0.42 J**	**0.93 J**	**94**	**670**
DG-U1	1	0.5-1	DG-U1S-0.5-1	12/13/2018	**2.0**	**97**	**98**	**0.12 J**	**0.041 J**	**76**	**12**	**48**	**28**	**1.2**	<0.21	**83**	<0.49	**0.22 J**	<0.47	**41**	**71**
DG-U1	1	3.5-4	DG-U1S-3.5-4	12/13/2018	**2.5**	**34**	**130**	**0.51**	**0.037 J**	**110**	**21**	**38**	**6.4**	**0.46**	<0.18	**130**	<0.43	<0.15	<0.42	**66**	**71**
DG-U2	1	0.5-1	DG-U2S-0.5-1	12/13/2018	**28**	**17**	**110**	<0.13	**1.2**	**35**	**11**	**190**	**2,200**	**0.56**	**3.7**	**51**	**1.3 J**	<0.20	<0.57	**58**	**240**
DG-U2	1	3.5-4	DG-U2S-3.5-4	2/5/2019	**3.2**	**4.4**	**120**	**0.45**	<0.031	**120**	**18**	**28**	**4.8**	**10**	<0.16	**180**	**1.5 J**	<0.13	**0.62**	**60**	**49**
DG-U3	1	0.5-1	DG-U3S-0.5-1	12/18/2018	**3.0**	**200**	**99**	**0.17 J**	**2**	**25**	**11**	**200**	**1,600**	**0.3**	**1.4 J**	**31**	**1.2 J**	**0.92 U**	<0.53	**60**	**420**
DG-U3	1	3.5-4	DG-U3S-3.5-4	12/18/2018	**1.2 J**	**65**	**36 J**	**0.92 J**	**0.3**	**32 J**	**15**	**49**	**12 J**	**0.11 J**	**0.61 J**	**40 J**	**0.60 J**	<0.12	<0.33	**35**	**90**
DG-U3 (D)	1	3.5-4	DG-U3 (D)S-3.5-4	12/18/2018	**3.3 J**	**84**	**64 J**	**0.46 J**	**0.35 J**	**79 J**	**19**	**34**	**25 J**	**0.47 J**	**0.59 J**	**100 J**	<0.50 UJ	<0.17	<0.48	**53**	**69**
DG-U4	1	0.5-1	DG-U4S-0.5-1	12/18/2018	**5.2**	**37 J**	**180**	<0.098	**2.7**	**37**	**11**	**170**	**320**	**0.4**	**4.0**	**130 J**	**3.0 U**	**0.45 J**	<0.44	**75**	**510**
DG-U4	1	3.5-4	DG-U4S-3.5-4	12/18/2018	<0.33 UJ	**35 J**	**36**	**0.14 J**	**0.066 J**	**12 J**	**9.2 J**	**47 J**	**5**	**0.034**	**0.39 J**	**11**	**3.9 U**	<0.20	<0.57	**54**	**38 J-**
DG-U4 (D)	1	0.5-1	DG-U4 (D)S-0.5-1	12/18/2018	**4.0**	**120 J**	**160**	<0.13	**2.8**	**43**	**12**	**280**	**470**	**0.51**	**3.1**	**42 J**	**3.9 U**	**0.37 J**	<0.56	**83**	**730**
DG-U5	1	0.5-1	DG-U5S-0.5-1	12/18/2018	**3.5**	**40**	**120**	<0.092	**2.5**	**39**	**12**	**230**	**430**	**0.16**	**4.1**	**25**	**2.8 U**	**0.37 J**	<0.41	**91**	**500**
DG-U5	1	3.5-4	DG-U5S-3.5-4	12/18/2018	**3.0**	**87**	**110**	**0.16 J**	**0.36 J**	**31**	**5.1**	**34**	**210**	**0.055**	**0.21 J**	**23**	<0.46	**0.17 J**	<0.45	**27**	**330**
DG-U6	1	0.5-1	DG-U6S-0.5-1	12/19/2018	**1.1 J**	**2.6 J**	**53**	<0.094	**0.22 J**	**17**	**8.7**	**140**	**400**	**0.049**	**0.31 J**	**8.3**	**0.55 J**	**0.19 J**	<0.42	**66**	**93**
DG-U6	1	3.5-4	DG-U6S-3.5-4	12/19/2018	**40**	**60**	**2,000**	**0.30 J**	**5.1**	**49**	**18**	**780**	**6,700**	**0.66**	**3.0 J**	**87**	<2.2	**3.4 J**	**2.2 J**	**23**	**2,200**
DG-U7	1	0.5-1	DG-U7S-0.5-1	1/8/2019	**0.75**	**5.1**	**72**	<0.096	**0.94**	**19**	**8.8**	**110**	**69**	**0.073**	<0.19	**27**	**1.0**	<0.15	**0.66**	**69**	**490**

Table 2: Metals Concentrations in Soil
Brisbane Baylands OU-2
Brisbane, California

Sample Location	Investigation Zone	Depth Range (ft bgs)	Sample Name	Collection Date	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
Direct Exposure Human Health Risk Level Residential Soil Exposure ESL [1]					1.1E+01	6.7E-02	1.5E+04	1.6E+01	7.8E+01	1.2E+05	2.3E+01	3.1E+03	8.0E+01	1.3E+01	3.9E+02	8.2E+02	3.9E+02	3.9E+02	7.8E-01	3.9E+02	2.3E+04
Regional Background [2]					5.5E+00	1.9E+01	3.2E+02	1.0E+00	2.7E+00	1.0E+02	2.5E+01	6.9E+01	1.6E+01	4.0E-01	7.4E+00	1.2E+02	5.6E+00	1.8E+00	7.6E+00	7.4E+01	1.1E+02
Units					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
DG-U7	1	3.5-4	DG-U7S-3.5-4	1/8/2019	**12**	**18**	**930**	<0.20	**2.8**	**33**	**8.9**	**810**	**2,600**	**0.42**	**0.55**	**40**	**4.8**	**6.7**	**1.0**	**40**	**1,800**
DG-U8	1	0.5-1	DG-U8S-0.5-1	1/15/2019	**1.4**	**2.3 U**	**53**	**0.79**	**0.29**	**12**	**12**	**120**	**58**	**0.12**	**0.76 J**	**7.9**	**1.5 J**	<0.12	**0.86 J**	**99**	**110**
DG-U8	1	3.5-4	DG-U8S-3.5-4	1/15/2019	**20**	**27**	**1,500**	**0.76**	**5.3**	**78**	**7.7**	**1,600**	**5,300**	**0.49**	**2.5**	**86**	**4.7 J**	**8.6**	<0.80	**32**	**4,200**
DG-U9	1	0.5-1	DG-U9S-0.5-1	12/20/2018	**5.4 J**	**9.3 J+**	**110 J+**	**0.26 J**	**1.9**	**57 J**	**11 J**	**350 J**	**510 J**	**0.24**	**2.3**	**27 J**	<0.53	<0.18	<0.51	**72 J**	**740 J**
DG-U9	1	3.5-4	DG-U9S-3.5-4	12/20/2018	**13**	**8.9**	**440**	**0.38 J**	**2.5**	**23**	**10**	**460**	**1,400**	**0.38**	**1.7 J**	**21 J**	<0.95	**0.34 J**	<0.92	**67**	**720**
DG-U9 (D)	1	3.5-4	DG-U9 (D)S-3.5-4	12/20/2018	**10**	**10**	**430**	<0.10 UJ	**1.7**	**22**	**11**	**450**	**1,300**	**0.27**	**0.30 J**	**43 J**	**0.72 J**	**0.75 J**	<0.45	**69**	**930**
DG-V1	1	0.5-1	DG-V1S-0.5-1	12/17/2018	**2.1**	**200**	**67**	<0.084	**0.39**	**74**	**15**	**61**	**51**	**1.9**	**0.17 J**	**80**	<0.39	<0.13	<0.37	**67**	**99**
DG-V1	1	3.5-4	DG-V1S-3.5-4	12/17/2018	**1.7**	**18**	**75**	**0.27 J**	<0.038	**120**	**18**	**26**	**3.5**	**0.31**	<0.20	**140**	<0.46	<0.16	<0.45	**52**	**51**
DG-V2	1	3.5-4	DG-V2S-3.5-4	12/13/2018	**1.9 J-**	**58 J**	**41 J+**	**0.67**	**0.16 J**	**32 J+**	**19**	**39 J+**	**17**	**0.21 J-**	**0.77 J**	**40 J+**	**1.2 J**	<0.19	<0.56	**39 J+**	**87 J**
DG-V2	1	3.5-4	DG-V2S-3.5-4	2/5/2019	**3.8**	**16**	**70**	**0.29 J**	**0.12 J**	**190**	**16**	**27**	**8.2**	**5.1**	<0.20	**170**	**0.94 J**	<0.16	**24 R**	**63**	**120**
DG-V2 (D)	1	0.5-1	DG-V2 (D)S-0.5-1	12/13/2018	**3**	**16**	**70**	**0.15 J**	**0.61**	**23**	**11**	**120**	**180**	**0.17**	**1.5 J**	**33**	**1.3 J**	<0.19	<0.55	**72**	**150**
DG-V3	1	0.5-1	DG-V3S-0.5-1	12/14/2018	**3.8**	**330**	**79**	**0.35 U**	**0.7**	**29**	**13**	**210**	**280**	**0.11**	**0.97 J**	**25**	**1.9 J**	<0.18	<0.51	**91**	**240**
DG-V3	1	3.5-4	DG-V3S-3.5-4	12/14/2018	**2.3**	**140**	**49**	**0.88**	**0.14 J**	**34**	**22**	**47**	**18**	**0.091**	**1.1 J**	**41**	**1.3 J**	<0.13	<0.36	**42**	**92**
DG-V4	1	0.5-1	DG-V4S-0.5-1	12/18/2018	**1.1 J**	**69**	**53**	<0.099	<0.038	**14**	**8.6**	**87**	**40**	**0.14**	**0.23 J**	**23**	**3.1 U**	<0.15	<0.44	**55**	**54**
DG-V4	1	3.5-4	DG-V4S-3.5-4	12/18/2018	**1.6 J**	**130**	**150**	**0.24 J**	<0.047	**43**	**10**	**28**	**22**	**0.085**	**0.26 J**	**96**	<0.57	<0.19	<0.55	**31**	**64**
DG-V5	1	0.5-1	DG-V5S-0.5-1	1/8/2019	**3.4**	**98**	**100**	**0.15**	**1.2**	**22**	**13**	**140**	**580**	**0.16**	**0.91**	**35**	**2.5**	**1.3**	**0.4**	**62**	**320**
DG-V5	1	3.5-4	DG-V5S-3.5-4	1/8/2019	**4.2**	**120**	**88**	**0.18**	**0.058**	**56**	**7.1**	**28**	**86**	**0.029**	<0.14	**37**	**1.1**	**0.12**	<0.32	**42**	**110**
DG-V5	1	7.5-8	DG-V5S-7.5-8	1/8/2019	**2.1**	**12**	**97**	**0.6**	<0.047	**42**	**10**	**41**	**5.9**	**0.023**	<0.24	**36**	**2.0**	<0.19	<0.55	**53**	**56**
DG-V6	1	0.5-1	DG-V6S-0.5-1	12/19/2018	**3.5**	**8.3**	**110**	<0.098	**1.1**	**28**	**8.9**	**140**	**350**	**0.27**	**1.1 J**	**43**	**0.82 J**	**0.21 J**	<0.44	**37**	**250**
DG-V6	1	3.5-4	DG-V6S-3.5-4	12/19/2018	**2.5**	**9.3**	**200**	**0.74**	**0.47 J**	**35**	**10**	**140**	**270**	**1.6**	<0.19	**37**	**0.76 J**	**0.92 J**	<0.43	**37**	**460**
DG-V6 (D)	1	3.5-4	DG-V6 (D)S-3.5-4	12/19/2018	**2.2**	**9.5**	**210**	**0.79**	**0.81 J**	**34**	**13**	**130**	**320**	**1.1**	<0.26	**38**	**0.97 J**	**0.34 J**	<0.58	**38**	**430**
DG-V7	1	0.5-1	DG-V7S-0.5-1	12/19/2018	**9.4**	**11**	**77**	**0.42**	<0.090	**42**	**13**	**130**	**810**	**0.12**	**3.3**	**37**	<1.1	**0.50 J**	<1.1	**52**	**220**
DG-V7	1	3.5-4	DG-V7S-3.5-4	12/19/2018	**5.3**	**6.6**	**240**	**0.087 J**	**0.67**	**23**	**6**	**220**	**680**	**0.075**	**1.1 J**	**26**	<0.38	**0.55 J**	<0.36	**31**	**480**
DG-V8	1	0.5-1	DG-V8S-0.5-1	1/15/2019	**46**	**31**	**1,600**	**0.97**	**2.9**	**42**	**14**	**510**	**5,500**	**0.77**	**4.1**	**42**	**6.0**	**12**	**2.1 J**	**29**	**1,600**
DG-V8	1	3.5-4	DG-V8S-3.5-4	1/15/2019	**4.7**	**12**	**310**	**0.99**	**1.2**	**59**	**9.9**	**120**	**770**	**0.31**	**1.5 J**	**40**	**2.4 J**	**0.80 J**	<0.48	**53**	**640**
DG-V9	1	0.5-1	DG-V9S-0.5-1	1/10/2019	<0.21	<0.21	**43**	<0.082	**0.091 J**	**7.2**	**9.4**	**91**	**14**	**0.075**	**0.28 J**	**3.3**	**0.54 J**	<0.13	**1.3**	**70**	**41**
DG-V9	1	3.5-4	DG-V9S-3.5-4	1/10/2019	**6.7 J**	**5.5 J**	**420 J**	**0.10 J**	**1.7 J**	**12 J**	**3.2 J**	**430 J**	**2,400 J**	**0.53**	**0.20 J**	**54**	**1.7 J**	**1.8 J**	**0.63 J**	**8.6 J+**	**1,600 J**
DG-V9	1	7.5-8	DG-V9S-7.5-8	1/10/2019	**0.79 J**	**7.5**	**120**	**0.52**	<0.025	**41**	**13**	**34**	**14**	**0.063**	**0.14 J**	**29**	**1.3 J**	<0.10	**0.34 J**	**48**	**53**
DG-W1	1	0.5-1	DG-W1S-0.5-1	12/13/2018	**3.4**	**330**	**140**	**0.15 J**	**0.45**	**85**	**16**	**94**	**110**	**3.1**	<0.23	**120**	<0.55	**0.29 J**	<0.53	**78**	**120**
DG-W1	1	3.5-4	DG-W1S-3.5-4	12/13/2018	**2.7**	**15**	**120**	**0.20 J**	<0.043	**95**	**14**	**27**	**3.4**	**0.51**	<0.22	**110**	<0.52	<0.17	<0.50	**62**	**49**
DG-W1	1	9-10	DG-W1S-9-10	12/13/2018	**1.5**	**49**	**46**	**0.78**	<0.033	**37**	**16**	**42**	**9.4**	**0.057**	**0.17 J**	**40**	<0.40	<0.13	<0.39	**45**	**92**
DG-W2	1	0.5-1	DG-W2S-0.5-1	12/14/2018	**6.6**	**33**	**96**	<0.12	**2.7**	**48**	**12**	**310**	**360**	**0.49**	**4.6**	**57**	**1.2 J**	**0.94 U**	<0.55	**38**	**400**
DG-W2	1	3.5-4	DG-W2S-3.5-4	12/14/2018	**2.3**	**29**	**120**	**0.34**	<0.038	**97**	**20**	**48**	**17**	**0.49**	<0.20	**140**	<0.46	**0.76 U**	<0.44	**51**	**65**
DG-W2	1	8.5-9	DG-W2S-8.5-9	12/14/2018	**3.1**	**41**	**51**	**0.71**	**0.12 J**	**31**	**19**	**44**	**8.9**	**0.049**	**0.47 J**	**41**	**0.55 J**	**0.87 U**	<0.50	**35**	**74**
DG-W3	1	0.5-1	DG-W3S-0.5-1	12/18/2018	**3.7**	**140**	**34**	<0.090	**0.46**	**12**	**12**	**99**	**120**	**0.078**	**0.50 J**	**12**	**0.77 J**	**0.69 U**	<0.40	**66**	**92**
DG-W3	1	3.5-4	DG-W3S-3.5-4	12/18/2018	**1.6 J**	**140**	**86**	**0.99**	**0.44 J**	**30**	**32**	**55**	**21**	**0.12**	**0.89 J**	**48**	**0.73 J**	<0.18	**0.79 J**	**37**	**97**
DG-W4	1	0.5-1	DG-W4S-0.5-1	12/18/2018	**0.30 J**	**34**	**32**	<0.071	<0.027	**7.1**	**7.1**	**65**	**3.9**	**0.059**	<0.14	**6.7**	<0.33	<0.11	<0.32	**49**	**28**
DG-W4	1	3.5-4	DG-W4S-3.5-4	12/18/2018	**1.3 J**	**37**	**23**	**0.13 J**	**0.21 J**	**33**	**3.7**	**33**	**14**	**0.16**	<0.22	**22**	**3.4 U**	<0.17	<0.50	**26**	**77**
DG-W5	1	0.5-1	DG-W5S-0.5-1	12/18/2018	**1.0 J**	**16**	**45**	<0.075	**0.56**	**15**	**14**	**160**	**140**	**0.34 J**	**0.61 J**	**11**	**2.3 U**	**0.28 J**	<0.34	**110**	**280**
DG-W5	1	3.5-4	DG-W5S-3.5-4	12/18/2018	**3.5 J**	**400 J**	**240 J**	**0.26 J**	**2.4 J**	**56 J**	**7.7 J**	**45 J+**	**7,200 J**	**0.66**	<0.23	**24 J**	<0.55	**0.46 J**	<0.53	**36 J**	**780 J**
DG-W5	1	8.5-9	DG-W5S-8.5-9	12/18/2018	**1.2 J**	**18**	**68**	**0.54**	<0.047	**39**	**18**	**31**	**9.9**	**0.054**	**0.43 J**	**39**	<0.57	<0.19	<0.55	**44**	**69**
DG-W5 (D)	1	0.5-1	DG-W5 (D)S-0.5-1	12/18/2018	**1.4 J**	**20**	**66**	<0.093	**0.69**	**16**	**14**	**190**	**140**	**0.091 J**	**0.83 J**	**15**	**2.9 U**	**0.40 J**	<0.41	**110**	**200**
DG-W6	1	0.5-1	DG-W6S-0.5-1	12/20/2018	**2.0**	**9.2**	**59**	<0.066	**0.53**	**16**	**4.8**	**74**	**83**	**0.21**	**0.47 J**	**13**	**0.66 J**	<0.10	<0.30	**34**	**110**
DG-W6	1	3.5-4	DG-W6S-3.5-4	12/20/2018	**32**	**18**	**910**	**0.43 J**	**1.5**	**27**	**6.7**	**770**	**4,000**	**1.4**	**0.52 J**	**24**	**1.4 J**	**4.1**	<1.1	**19**	**1,300**
DG-W7	1	0.5-1	DG-W7S-0.5-1	1/29/2019	**0.48 J**	**2.7**	**62**	**0.086 J**	**0.44**	**14**	**6.9**	**68**	**56**	**0.096**	**0.47 J**	**22**	**0.37 J**	<0.12	<0.34 R	**42**	**98**
DG-W7	1	3.5-4	DG-W7S-3.5-4	1/29/2019	**65**	**30**	**1,300**	<0.21	**3.5**	**70**	**15**	**1,100**	**4,900**	**0.52**	**1.5 J**	**72**	**2.1 J**	**7**	**0.96 R**	**35**	**2,200**
DG-W8	1	0.5-1	DG-W8S-0.5-1	1/29/2019	**17 J**	**7.6**	**690**	**0.16 J**	**0.99**	**22 J**	**5.9 J**	**150 J**	**740 J**	**0.24**	**0.28 J**	**23 J**	<0.58	**1.6**	<0.56 R	**28**	**700 J**
DG-W8	1	3.5-4	DG-W8S-3.5-4	1/29/2019	**19**	**11**	**1,200**	**0.67 J**	**1.5 J**	**28**	**4.7**	**500**	**2,800 J**	**0.39**	<0.50 UJ	**42**	<1.2	**6.3**	<1.1 R	**26**	**1,500**
DG-W8 (D)	1	3.5-4	DG-W8 (D)S-3.5-4	1/29/2019	**26**	**14**	**1,500**	**1.0 J**	**2.6 J**	**36**	**5.4**	**620**	**6,600 J**	**0.46**	**0.84 J**	**38**	<0.44	**6.6**	<0.43 R	**31**	**2,200**
DG-W9	1	0.5-1	DG-W9S-0.5-1	12/20/2018	**0.89 J**	**2.1 J**	**55**	**0.19 J**	**0.27**	**26**	**7.0**	**92**	**77**	**0.075**	**0.42 J**	**15**	<0.32	<0.11	<0.31	**66**	**96**
DG-W9	1	3.5-4	DG-W9S-3.5-4	12/20/2018	**27**	**38**	**960**	**0.51 J**	**2.8**	**33**	**11**	**950**	**7,500**	**0.93**	**1.5 J**	**40**	<1.6	**3.2**	<1.5	**25**	**2,700**
DG-W9	1	8.5-9	DG-W9S-8.5-9	12/20/2018	**22**	**29**	**600**	**0.89**	**3.2**	**46**	**9.2**	**530**	**2,200**	**0.1**	**5.4**	**48**	<1.1	**4.4**	<1.1	**29**	**1,300**
DG-X1	1	0.5-1	DG-X1S-0.5-1	12/17/2018	**3.3 J**	**110**	**140 J**	**0.25 J**	<0.047	**170 J**	**26**	**44**	**25**	**11 J**	<0.24	**240 J**	<0.57 UJ	<0.19	<0.55	**78**	**85**

Table 2: Metals Concentrations in Soil
Brisbane Baylands OU-2
Brisbane, California

Sample Location	Investigation Zone	Depth Range (ft bgs)	Sample Name	Collection Date	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
Direct Exposure Human Health Risk Level Residential Soil Exposure ESL [1]					1.1E+01	6.7E-02	1.5E+04	1.6E+01	7.8E+01	1.2E+05	2.3E+01	3.1E+03	8.0E+01	1.3E+01	3.9E+02	8.2E+02	3.9E+02	3.9E+02	7.8E-01	3.9E+02	2.3E+04
Regional Background [2]					5.5E+00	1.9E+01	3.2E+02	1.0E+00	2.7E+00	1.0E+02	2.5E+01	6.9E+01	1.6E+01	4.0E-01	7.4E+00	1.2E+02	5.6E+00	1.8E+00	7.6E+00	7.4E+01	1.1E+02
Units					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
DG-X1	1	3.5-4	DG-X1S-3.5-4	12/17/2018	**2.1 J**	**16 J**	**98 J**	**0.29 J**	<0.048	**110 J**	**17 J**	**29 J+**	**5.1 J**	**0.16 J+**	<0.25	**120 J**	<0.58	<0.20	<0.56	**52 J+**	**50 J**
DG-X1 (D)	1	0.5-1	DG-X1 (D)S-0.5-1	12/17/2018	**1.7 UJ**	**67**	**70 J**	<0.11 UJ	<0.042	**67 J**	**17**	**59**	**20**	**3.1 J**	<0.22	**92 J**	**0.56 J**	<0.17	<0.50	**76**	**65**
DG-X2	1	0.5-1	DG-X2S-0.5-1	12/14/2018	**5**	**560**	**100**	<0.089	**0.31 J**	**27**	**9.4**	**160**	**220**	**3.1**	**0.20 J**	**31**	**0.42 J**	**1.0**	<0.40	**69**	**220**
DG-X2	1	3.5-4	DG-X2S-3.5-4	12/14/2018	**1.7**	**8.8**	**35**	**0.63**	**0.4**	**30**	**16**	**44**	**25**	**0.036**	**0.29 J**	**32**	**0.88 J**	**0.81 U**	<0.47	**39**	**110**
DG-X3	1	0.5-1	DG-X3S-0.5-1	12/14/2018	**9.8**	**180**	**75**	**0.36 U**	**1.5**	**30**	**9.8**	**180**	**420**	**0.28**	**2.8**	**37**	**1.3 J**	<0.18	<0.53	**50**	**1,200**
DG-X3	1	3.5-4	DG-X3S-3.5-4	12/14/2018	**1.1 U**	**9.3**	**52**	**0.61**	**0.078 J**	**26**	**28**	**38**	**14**	**0.034**	**0.69 J**	**33**	**0.58 J**	<0.11	<0.31	**33**	**66**
DG-X4	1	0.5-1	DG-X4S-0.5-1	12/18/2018	**1.4 J**	**54**	**36**	<0.10	<0.040	**5.9**	**7.8**	**74**	**40**	**0.17**	<0.20	**4.6**	**3.2 U**	<0.16	<0.46	**58**	**54**
DG-X4	1	3.5-4	DG-X4S-3.5-4	12/18/2018	**0.61 J**	**29**	**37**	**0.16 J**	<0.041	**50**	**5.2**	**7.3**	**1.5 J**	**0.015 U**	<0.21	**38**	<0.50	<0.17	<0.48	**35**	**17**
DG-X5	1	0.5-1	DG-X5S-0.5-1	1/8/2019	**2**	**120**	**60**	<0.073	**0.44**	**15**	**15**	**140**	**130**	**0.17**	**3.8**	**16**	**2.8**	**0.5**	<0.32	**97**	**140**
DG-X5	1	3.5-4	DG-X5S-3.5-4	1/8/2019	**1.8**	**36**	**56**	**0.14**	<0.033	**59**	**7.0**	**8.5**	**5.7**	**0.034**	<0.17	**40**	**1.1**	<0.13	<0.38	**43**	**31**
DG-X6	1	0.5-1	DG-X6S-0.5-1	12/20/2018	**2.9**	**6.3**	**81**	<0.11	**0.96**	**26**	**7.2**	**150**	**130**	**0.19**	**0.86 J**	**32**	<0.50	<0.17	<0.49	**38**	**230**
DG-X6	1	3.5-4	DG-X6S-3.5-4	12/20/2018	**13**	**19**	**890**	**0.37**	**9.0**	**69**	**9.4**	**360**	**1,800**	**0.68**	**0.67 J**	**160**	**0.98 J**	**3.6**	<0.76	**19**	**2,400**
DG-X7	1	0.5-1	DG-X7S-0.5-1	12/19/2018	**6.9 J**	**5.3**	**75**	<0.099 UJ	**0.96**	**24**	**7.6**	**1,200 J**	**230**	**0.25**	**2.1**	**31**	<0.46	<0.15	<0.44	**44**	**210**
DG-X7	1	3.5-4	DG-X7S-3.5-4	12/19/2018	**1.7 J**	**3.5 J**	**100**	<0.12	**0.27 J**	**15**	**4.6**	**82**	**210**	**0.029**	**0.39 J**	**13**	<0.55	**0.43 J**	<0.53	**27**	**130**
DG-X7 (D)	1	0.5-1	DG-X7 (D)S-0.5-1	12/19/2018	**2.5 J**	**8.2**	**98**	**0.22 J**	**1.2**	**37**	**10**	**150 J**	**220**	**0.16**	**2.3**	**27**	<0.48	<0.16	<0.47	**67**	**280**
DG-X8	1	0.5-1	DG-X8S-0.5-1	1/29/2019	**1.8**	**4.7**	**150**	<0.11	**0.45**	**17**	**5.1**	**48**	**240**	**0.08**	<0.21	**20**	<0.49	**1.3**	<0.48 R	**26**	**190**
DG-X8	1	3.5-4	DG-X8S-3.5-4	1/29/2019	**28**	**34**	**970**	<0.25	**5.9**	**38**	**12**	**790**	**9,600**	**0.19**	<0.49	**42**	**4.0 J**	**4.8**	<1.1 R	**32**	**4,000**
DG-X9	1	0.5-1	DG-X9S-0.5-1	1/10/2019	<0.43	<0.44	**65**	<0.17	<0.064	**41**	**29**	**250**	**46**	**0.062**	<0.33	**5.2**	**1.9 J**	<0.26	**3.6**	**260**	**120**
DG-X9	1	3.5-4	DG-X9S-3.5-4	1/10/2019	**16**	**8.3**	**520**	**0.11 J**	**1.2**	**14**	**3.3**	**310**	**1,300**	**2.1**	**0.76 J**	**33**	**2.7 J**	**1.7**	<0.41	**12**	**1,400**
DG-Y1	1	0.5-1	DG-Y1S-0.5-1	12/13/2018	<0.21 R	**1.9 J**	**39 J**	<0.084	**0.092 J**	**9.8 J**	**6.2 J**	**96 J**	**17 J**	**0.1**	<0.17	**10 J**	<0.39	**0.13 J**	<0.37	**56 J**	**44 J**
DG-Y1	1	3.5-4	DG-Y1S-3.5-4	12/13/2018	**2.8**	**32**	**110**	**0.32**	**0.092 J**	**180**	**22**	**38**	**6.8**	**2.3**	**0.16 J**	**210**	<0.30	**0.27 J**	<0.29	**66**	**56**
DG-Y2	1	0.5-1	DG-Y2S-0.5-1	12/14/2018	**2.2**	**92**	**69**	<0.12	**0.32 J**	**24**	**7.5**	**110**	**110**	**0.46**	**0.48 J**	**24**	<0.54	**0.89 U**	<0.52	**36**	**110**
DG-Y2	1	3.5-4	DG-Y2S-3.5-4	12/14/2018	**2.4**	**130**	**72**	**0.35**	**0.036 J**	**65**	**17**	**43**	**25**	**0.31**	<0.15	**86**	<0.35	**0.58 U**	<0.34	**52**	**73**
DG-Y3	1	0.5-1	DG-Y3S-0.5-1	12/18/2018	**12**	**110**	**200**	**0.12 J**	**12**	**82**	**17**	**440**	**940**	**1.2**	**9.4**	**140**	**3.1 J**	**1.1**	<0.55	**66**	**1,500**
DG-Y3	1	3.5-4	DG-Y3S-3.5-4	12/18/2018	**1.5 J**	**34**	**61**	**0.6**	**0.30 J**	**33**	**19**	**32**	**12**	**0.082**	**0.44 J**	**37**	**0.68 J**	<0.18	<0.51	**39**	**73**
DG-Y4	1	0.5-1	DG-Y4S-0.5-1	12/18/2018	**4.1**	**94**	**200**	<0.11	**1.0**	**49**	**10**	**1,300**	**360**	**0.26**	**1.3 J**	**63**	**1.4 J**	**0.41 J**	<0.48	**41**	**370**
DG-Y4	1	3.5-4	DG-Y4S-3.5-4	12/18/2018	**0.80 J**	**36 J**	**90 J**	**0.28 J**	**0.077 J**	**47**	**9.5**	**24**	**20 J**	**0.029**	**0.45 J**	**60**	**0.72 J**	**0.21 J**	<0.34	**26 J**	**42**
DG-Y4 (D)	1	3.5-4	DG-Y4 (D)S-3.5-4	12/18/2018	**0.80 J**	**130 J**	**190 J**	**0.78 J**	<0.046 UJ	**74**	**13**	**28**	**58 J**	**0.047**	**0.70 J**	**67**	**0.71 J**	<0.19 UJ	<0.54	**56 J**	**61**
DG-Y5	1	0.5-1	DG-Y5S-0.5-1	12/18/2018	**2.9**	**9.7**	**82**	<0.071	**1.9**	**76**	**9.6**	**160**	**270**	**0.41**	**2.6**	**30**	<0.33	**0.24 J**	<0.32	**64**	**340**
DG-Y5	1	3.5-4	DG-Y5S-3.5-4	12/18/2018	**0.69 J**	**2.7**	**26**	<0.084	**0.051 J**	**19**	**3.0**	**5.0**	**7.9**	**0.0086 J**	<0.17	**14**	**2.6 U**	<0.13	<0.38	**15**	**16**
DG-Y6	1	0.5-1	DG-Y6S-0.5-1	12/20/2018	**1.6 J**	**8.3**	**150**	<0.11	**0.58**	**18**	**11**	**81**	**500**	**0.2**	**1.8**	**38**	**0.69 J**	**0.64 J**	<0.50	**44**	**150**
DG-Y6	1	3.5-4	DG-Y6S-3.5-4	12/20/2018	**19**	**31**	**2,500**	**1.2**	**3.7**	**140**	**9.5**	**660**	**6,400**	**0.26**	**1.7**	**83**	**1.0 J**	**5.0**	<0.50	**32**	**2,500**
DG-Y7	1	0.5-1	DG-Y7S-0.5-1	1/9/2019	**1.8**	**3.9**	**71**	**0.14**	**0.28**	**18**	**5.3**	**56**	**110**	**0.042**	**0.42**	**23**	<0.39	**0.13**	<0.38	**20**	**170**
DG-Y7	1	3.5-4	DG-Y7S-3.5-4	1/9/2019	**26**	**13**	**1,700**	**0.82**	**2.6**	**38**	**4.6**	**3,400**	**6,700**	**0.43**	**2.1**	**39**	**1.7**	**9.9**	<0.52	**29**	**2,400**
DG-Y8	1	0.5-1	DG-Y8S-0.5-1	1/29/2019	**95**	**22**	**2,300**	**0.52 J**	**3.9**	**47**	**7.2**	**1,100**	**7,600**	**0.61**	**0.64 J**	**45**	<1.3	**6.9**	<1.3 R	**27**	**2,900**
DG-Y8	1	3.5-4	DG-Y8S-3.5-4	1/29/2019	**79**	**68**	**1,100**	<0.20	**5.2**	**44**	**12**	**15,000**	**5,000**	**0.7**	**2.8 J**	**82**	**2.1 J**	**9.1**	**1.0 R**	**15**	**2,800**
DG-Y9	1	0.5-1	DG-Y9S-0.5-1	12/20/2018	<0.27	**5.0**	**39**	**0.34**	**0.21 J**	**11**	**12**	**150**	**12**	**0.1**	**0.64 J**	**4.1**	**0.96 J**	<0.17	<0.48	**120**	**58**
DG-Y9	1	3.5-4	DG-Y9S-3.5-4	12/20/2018	**100**	**47**	**1,100**	<0.54	**2.1**	**51**	**16**	**1,100**	**4,900**	**0.74**	**1.2 J**	**92**	<2.5	**18**	<2.4	**56**	**2,100**
DG-Z2	1	0.5-1	DG-Z2S-0.5-1	12/14/2018	**2.1**	**74**	**95**	<0.12	**0.47**	**27**	**10**	**120**	**190**	**0.28**	**0.79 J**	**27**	**0.68 J**	**0.90 U**	<0.52	**67**	**180**
DG-Z2	1	3.5-4	DG-Z2S-3.5-4	12/14/2018	**2.9**	**99**	**90**	**0.13 J**	<0.043	**92**	**17**	**29**	**7.1**	**7.6**	<0.22	**170**	<0.52	**0.86 U**	<0.50	**64**	**46**
DG-Z3	1	0.5-1	DG-Z3S-0.5-1	12/14/2018	**5**	**290**	**100**	<0.098	**0.31 J**	**22**	**11**	**210**	**370**	**0.28**	**0.83 J**	**29**	**1.6 J**	<0.15	<0.44	**76**	**130**
DG-Z3	1	3.5-4	DG-Z3S-3.5-4	12/14/2018	**1.4**	**43**	**120**	<0.068	**0.092 J**	**120**	**20**	**39**	**20**	**3**	**0.70 J**	**160**	**0.80 J**	<0.11	<0.30	**75**	**79**
DG-Z4	1	0.5-1	DG-Z4S-0.5-1	12/18/2018	**34**	**840**	**100**	**0.12 J**	**1.8**	**18**	**10**	**200**	**2,100**	**1.1**	**0.86 J**	**16**	**1.3 J**	**0.62 J**	<0.37	**64**	**260**
DG-Z4	1	3.5-4	DG-Z4S-3.5-4	12/18/2018	**0.87 J**	**72**	**80**	**0.4**	**0.081 J**	**44**	**9.0**	**21**	**13**	**0.088**	**0.42 J**	**75**	**0.44 J**	<0.15	<0.42	**25**	**38**
DG-Z5	1	0.5-1	DG-Z5S-0.5-1	1/8/2019	**1.6**	**31**	**62**	<0.091	**0.36**	**14**	**11**	**140**	**160**	**0.12**	**0.33**	**9.7**	**1.5**	**0.25**	**0.57**	**88**	**160**
DG-Z5	1	3.5-4	DG-Z5S-3.5-4	1/8/2019	**1.3**	**11**	**36**	**0.13**	<0.034	**30**	**4.3**	**5.9**	**3.2**	**0.021**	**0.26**	**23**	<0.42	<0.14	<0.40	**22**	**19**
DG-Z6	1	0.5-1	DG-Z6S-0.5-1	12/20/2018	**2.3**	**9.5**	**82**	<0.092	**0.63**	**26**	**11**	**110**	**190**	**0.11**	**1.1 J**	**29**	<0.43	<0.14	**0.82 J**	**67**	**160**
DG-Z6	1	3.5-4	DG-Z6S-3.5-4	12/20/2018	**33**	**16**	**1,300**	**0.72**	**4.3**	**39**	**6.7**	**640**	**5,800**	**0.37**	**0.66 J**	**100**	<0.54	**4.2**	<0.52	**27**	**3,900**
DG-Z6 (D)	1	0.5-1	DG-Z6 (D)S-0.5-1	12/20/2018	**2.6**	**11**	**94**	<0.10	**0.73**	**25**	**12**	**120**	**130**	**0.095**	**0.69 J**	**32**	<0.47	<0.16	<0.46 UJ	**71**	**170**
DG-Z7	1	0.5-1	DG-Z7S-0.5-1	11/21/2018	**26**	**18**	**1,300**	**0.8**	**2.3**	**46**	**6.1**	**570**	**3,200**	**0.51**	**0.76 J**	**67**	<0.56	**4.7**	<0.54	**35**	**1,500**
DG-Z7	1	0.5-1	DG-Z7S-0.5-1	2/4/2019	**3.7 J-**	**7.3**	**63 J**	<0.12	**1.2**	**28 J**	**10 J**	**120 J-**	**220 J**	**0.21**	**1.6 J**	**39 J**	**2.6 J**	<0.19	**1.4**	**54 J**	**230 J**
DG-Z7	1	3.5-4	DG-Z7S-3.5-4	11/21/2018	**2.4**	**5.2**	**130**	<0.11	**0.63**	**23**	**9.5**	**84**	**130**	**0.12**	**0.83 J**	**34**	<0.50	**0.83 U**	<0.48	**47**	**170**
DG-Z7	1	3.5-4	DG-Z7S-3.5-4	2/4/2019	**22 J-**	**11**	**1,400**	**0.8**	**2.1**	**34**	**4.6**	**570**	**4,300**	**0.56 J+**	**0.44 J**	**69 J**	**0.96 J**	**5.5**	<0.55	**26**	**1,900**

Table 2: Metals Concentrations in Soil
Brisbane Baylands OU-2
Brisbane, California

Sample Location	Investigation Zone	Depth Range (ft bgs)	Sample Name	Collection Date	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
Direct Exposure Human Health Risk Level Residential Soil Exposure ESL [1]					1.1E+01	6.7E-02	1.5E+04	1.6E+01	7.8E+01	1.2E+05	2.3E+01	3.1E+03	8.0E+01	1.3E+01	3.9E+02	8.2E+02	3.9E+02	3.9E+02	7.8E-01	3.9E+02	2.3E+04
Regional Background [2]					5.5E+00	1.9E+01	3.2E+02	1.0E+00	2.7E+00	1.0E+02	2.5E+01	6.9E+01	1.6E+01	4.0E-01	7.4E+00	1.2E+02	5.6E+00	1.8E+00	7.6E+00	7.4E+01	1.1E+02
Units					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
DG-Z8	1	0.5-1	DG-Z8S-0.5-1	1/29/2019	**19**	**13**	**550**	**0.25 J**	**1.4**	**32**	**7.5**	**370**	**1,900**	**0.6**	**0.33 J**	**38**	<0.40	**2.2**	<0.39 R	**30**	**1,200**
DG-Z8	1	3.5-4	DG-Z8S-3.5-4	1/29/2019	**44**	**29**	**1,400**	**0.36**	**8.8**	**42**	**8.7**	**760**	**4,900**	**1.5**	**0.64 J**	**44**	**1.5 J**	**5.7**	<1.2	**26**	**2,700**
DG-Z9	1	0.5-1	DG-Z9S-0.5-1	1/9/2019	**1.6**	**4.2**	**73**	**0.15**	**0.53**	**15**	**9.9**	**160**	**120**	**0.15**	**0.57**	**11**	**0.8**	<0.12	<0.35	**71**	**210**
DG-Z9	1	3.5-4	DG-Z9S-3.5-4	1/9/2019	**66**	**28**	**1,600**	**0.71**	**5.1**	**48**	**7**	**1,200**	**15,000**	**0.65**	**2.3**	**37**	**4.4**	**11**	<1.2	**30**	**2,900**
DG-Z9 (D)	1	0.5-1	DG-Z9 (D)S-0.5-1	1/9/2019	**1.6**	**4.6**	**50**	**0.094**	**0.28**	**12**	**9.5**	**130**	**76**	**0.1**	**0.57**	**10**	**0.76**	**0.32**	<0.41	**72**	**110**
DG-AH10	2	0.5-1	DG-AH10S-0.5-1	1/15/2019	**2.0**	**7.8**	**130**	<0.096	**1.9**	**25**	**9.8**	**240**	**270**	**0.28**	**1.8**	**24**	**0.46 J**	**0.57 J**	<0.43	**86**	**620**
DG-AH10	2	3.5-4	DG-AH10S-3.5-4	1/15/2019	**2.4**	**5.5**	**83**	<0.067	**0.69**	**19**	**8.8**	**140**	**540**	**0.064**	**1.2**	**9.0**	**0.79 J**	<0.10	<0.30	**76**	**490**
DG-AH8	2	0.5-1	DG-AH8S-0.5-1	1/30/2019	**0.56 J**	**1.6 J**	**49**	**0.4**	**0.15 J**	**11**	**13**	**150**	**27**	**0.082**	<0.15 U	**11**	<0.36 U	<0.12 U	<0.35 U	**100**	**86**
DG-AH8	2	3.5-4	DG-AH8S-3.5-4	1/30/2019	<0.17 U	**3.7**	**52**	**0.17 J**	**0.15 J**	**14**	**5.1**	**12**	**8.9**	**0.019**	**0.26 J**	**15**	**2.1 U**	<0.10 U	<0.30 U	**28**	**27**
DG-AH9	2	0.5-1	DG-AH9S-0.5-1	1/30/2019	**1.8 J**	**4.3**	**90**	**0.31 J**	**0.59**	**20**	**7.6**	**130**	**110**	**0.15**	**0.45 J**	**15**	<0.59	**0.25 J**	<0.57	**71**	**200**
DG-AH9	2	3.5-4	DG-AH9S-3.5-4	1/30/2019	<0.31	**4.0**	**85**	**0.17 J**	**0.15 J**	**15**	**5.2**	**32**	**210**	**0.041**	<0.24	**15**	**3.8 U**	<0.19	<0.55	**29**	**93**
DG-AI10	2	0.5-1	DG-AI10S-0.5-1	1/29/2019	**2.2**	**2.0 J**	**61**	<0.10	**0.72**	**55**	**9.6**	**110**	**650**	**0.11**	**0.92 J**	**9.9**	**0.72 J**	<0.16	<0.46	**85**	**250**
DG-AI10	2	3.5-4	DG-AI10S-3.5-4	1/29/2019	**1.1 J**	**3.5 J**	**45**	<0.12	**0.13 J**	**11**	**3.8**	**19**	**18**	**0.0084 J**	<0.24	**11**	**0.57 J**	<0.19	<0.55	**24**	**28**
DG-AI2	2	0.5-1	DG-AI2S-0.5-1	12/14/2018	**1.3 J**	**55**	**92**	<0.11	**0.74**	**41**	**11**	**110**	**150**	**2.0**	**1.3 J**	**43**	<0.51	<0.17	<0.50	**70**	**170**
DG-AI2	2	3.5-4	DG-AI2S-3.5-4	12/14/2018	**0.49 J**	**69**	**33**	<0.094	**0.30 J**	**9.6**	**12**	**110**	**370**	**0.064**	**0.35 J**	**5.4**	<0.43	**0.22 J**	<0.42	**81**	**83**
DG-AI3	2	0.5-1	DG-AI3S-0.5-1	12/19/2018	<0.27 R	**0.62 J**	**38 J**	<0.11 U	**0.11 J**	**5.9 J+**	**8.2**	**98 J+**	**6.6**	**0.066**	**0.35 J**	**2.7**	<0.49	<0.16	<0.47	**75 J+**	**35**
DG-AI3	2	3.5-4	DG-AI3S-3.5-4	12/19/2018	**0.76 J**	**59 J**	**220**	**0.41**	**0.12 J**	**33**	**18**	**48 J**	**29 J**	**0.21**	**0.82 J**	**47**	<0.41	<0.14	<0.39	**37 J**	**110**
DG-AI3 (D)	2	3.5-4	DG-AI3 (D)S-3.5-4	12/19/2018	**1.3 J**	**110 J**	**160**	**0.25**	**0.33 J**	**27**	**15**	**85 J**	**57 J**	**0.21**	**0.83 J**	**34**	<0.37	<0.12	<0.36	**62 J**	**170**
DG-AI4	2	0.5-1	DG-AI4S-0.5-1	12/18/2018	**1.2 J**	**6**	**62**	**0.14 J**	**0.56**	**12**	**8.9**	**150**	**50**	**0.07**	**0.85 J**	**15**	<0.54	<0.18	<0.52	**79**	**290**
DG-AI4	2	3.5-4	DG-AI4S-3.5-4	12/18/2018	**2.0**	**110**	**88**	<0.098	**0.44**	**25**	**9.7**	**130**	**190**	**0.11**	**0.97 J**	**19**	<0.45	<0.15	<0.44	**86**	**230**
DG-AI5	2	0.5-1	DG-AI5S-0.5-1	12/17/2018	**2.3**	**12**	**200**	**0.22 J**	**0.85**	**20**	**11**	**480**	**240**	**0.13**	**1.9**	**20**	<0.55	**0.58 J**	<0.53	**82**	**270**
DG-AI5	2	3.5-4	DG-AI5S-3.5-4	12/17/2018	**6.8**	**420**	**100**	<0.084	**1.7**	**21**	**13**	**250**	**240**	**0.13**	**0.81 J**	**29**	<0.39	**0.50 J**	<0.37	**73**	**320**
DG-AI6	2	0.5-1	DG-AI6S-0.5-1	12/20/2018	**0.86 J**	<0.26	**13**	**1.5**	**0.23 J**	**8.9**	**15**	**73**	**11**	**0.051**	**0.57 J**	**6.0**	<0.47	<0.16	<0.45	**120**	**58**
DG-AI6	2	3.5-4	DG-AI6S-3.5-4	12/20/2018	**6.8**	**13**	**340**	**1.0**	**3.1**	**31**	**12**	**140**	**630**	**0.42**	**3.0**	**28**	**0.92 J**	<0.17	<0.49	**84**	**430**
DG-AI7	2	0.5-1	DG-AI7S-0.5-1	1/9/2019	**40**	**16**	**360**	**0.36**	**10**	**960**	**26**	**1,000**	**1,400**	**8.1**	**44**	**550**	**6.0**	**2.2**	**0.79**	**60**	**2,700**
DG-AI7	2	3.5-4	DG-AI7S-3.5-4	1/9/2019	**1.1**	**4.4**	**68**	**0.15**	**0.38**	**25**	**6.1**	**26**	**32**	**0.054**	**0.55**	**30**	**0.89**	<0.11	<0.31	**30**	**60**
DG-AI7	2	8-8.5	DG-AI7S-8-8.5	1/9/2019	**30**	**31**	**870**	**0.74**	**2.2**	**39**	**17**	**1700**	**4,400**	**1.3**	**4.3**	**41**	**5.9**	**4.2**	**1.3**	**27**	**1,600**
DG-AI8	2	0.5-1	DG-AI8S-0.5-1	1/30/2019	<0.19 U	**4.3**	**76**	**0.22 J**	**0.10 J**	**20**	**5.3**	**21**	**46**	**0.022**	<0.15 U	**19**	**2.3 U**	<0.12 U	<0.33 U	**32**	**62**
DG-AI8	2	3.5-4	DG-AI8S-3.5-4	1/30/2019	<0.19 U	**4.9**	**160**	**0.35**	**0.098 J**	**14**	**7.4**	**34**	**94**	**0.36**	**0.35 J**	**15**	<0.34 U	<0.11 U	<0.32 U	**68**	**86**
DG-AI9	2	0.5-1	DG-AI9S-0.5-1	1/30/2019	**5.3**	**8.8**	**110**	<0.11 U	**1.1**	**46**	**9.4**	**210**	**430**	**0.28**	**2.1**	**66**	**3.3 U**	<0.17 U	<0.48 U	**44**	**420**
DG-AI9	2	3.5-4	DG-AI9S-3.5-4	1/30/2019	**0.71 J**	**4.6**	**71**	<0.080 U	**0.12 J**	**16**	**5.1**	**22**	**54**	**0.032**	**0.49 J**	**18**	**2.5 U**	<0.12 U	<0.36 U	**30**	**87**
DG-AJ10	2	0.5-1	DG-AJ10S-0.5-1	1/15/2019	<0.19	**0.38 J**	**26**	<0.076	**0.21 J**	**26**	**11**	**86**	**41**	**0.041**	**0.61 J**	**340**	**0.71 J**	<0.12	<0.34	**84**	**53**
DG-AJ10	2	3.5-4	DG-AJ10S-3.5-4	1/15/2019	<0.19	**3.9**	**78**	**0.11 J**	**0.31**	**43**	**11**	**74**	**40**	**0.055**	**0.48 J**	**53**	**0.37 J**	<0.12	<0.34	**60**	**88**
DG-AJ2	2	0.5-1	DG-AJ2S-0.5-1	12/14/2018	<0.31	**13**	**44**	<0.12	**0.33 J**	**9.1**	**8.1**	**93**	**41**	**0.89**	**0.46 J**	**5.9**	<0.56	<0.19	<0.54	**66**	**110**
DG-AJ2	2	3.5-4	DG-AJ2S-3.5-4	12/14/2018	**7.2**	**180**	**120**	**0.34 J**	**0.20 J**	**32**	**10**	**110**	**960**	**1.3**	**0.47 J**	**40**	<0.54	<0.18	<0.52	**49**	**110**
DG-AJ3	2	0.5-1	DG-AJ3S-0.5-1	12/14/2018	**1.7 U**	**16**	**56**	<0.11	**0.18 J**	**12**	**9.2**	**140**	**26**	**0.072**	**0.38 J**	**4.9**	**1.7 J**	<0.17	<0.48	**110**	**68**
DG-AJ3	2	3.5-4	DG-AJ3S-3.5-4	12/14/2018	**1.5 U**	**66**	**73**	<0.096	<0.037	**14**	**14**	**110**	**11**	**0.06**	**0.74 J**	**7.5**	**0.84 J**	<0.15	<0.43	**90**	**60**
DG-AJ4	2	0.5-1	DG-AJ4S-0.5-1	12/18/2018	**0.92 J**	**6.9**	**81**	<0.11	**0.61**	**18**	**12**	**110**	**250**	**0.072**	**1.1 J**	**17**	<0.52	**0.43 J**	<0.50	**100**	**160**
DG-AJ4	2	3.5-4	DG-AJ4S-3.5-4	12/18/2018	<0.19	**27**	**29**	<0.073	**0.11 J**	**15**	**11**	**150**	**20**	**0.088**	**0.41 J**	**4.9**	<0.34	<0.11	<0.33	**100**	**69**
DG-AJ5	2	0.5-1	DG-AJ5S-0.5-1	1/8/2019	**1.0**	**2.6**	**45**	**0.086**	**0.51**	**14**	**9.4**	**130**	**41**	**0.11**	**0.53**	**7.7**	**1.6**	<0.13	<0.36	**87**	**120**
DG-AJ5	2	3.5-4	DG-AJ5S-3.5-4	1/8/2019	**11**	**620**	**80**	<0.23	**2.1**	**29**	**10**	**150**	**270**	**0.91**	**0.89**	**37**	**3.3**	<0.36	<1.0	**36**	**670**
DG-AJ6	2	0.5-1	DG-AJ6S-0.5-1	12/20/2018	**1.1 J**	**0.54 J**	**17**	**1.7**	**0.14 J**	**12**	**17**	**800 J**	**3.0 J**	**0.063**	**0.77 J**	**5.7 J**	**1.7 J**	<0.14	<0.39	**140**	**55 J**
DG-AJ6	2	3.5-4	DG-AJ6S-3.5-4	12/20/2018	**12**	**21**	**220**	**0.72**	**18**	**52**	**9.3**	**190**	**620**	**0.46**	**2.7**	**41**	**1.1 J**	**1.7**	<0.46	**49**	**750**
DG-AJ6 (D)	2	0.5-1	DG-AJ6 (D)S-0.5-1	12/20/2018	**2.2 J**	**1.2 J**	**25**	**1.5**	**0.68 J**	**16**	**17**	**180 J**	**70 J**	**0.1**	**1.3 J**	**11 J**	**0.94 J**	<0.19	<0.55	**130**	**140 J**
DG-AJ7	2	0.5-1	DG-AJ7S-0.5-1	12/19/2018	**38**	**25**	**290**	<0.12	**9.8**	**230**	**20**	**1,200**	**3,000**	**2.0**	**40**	**180**	<1.4	**2.5**	<1.3	**41**	**2,000**
DG-AJ7	2	3.5-4	DG-AJ7S-3.5-4	12/19/2018	**1.4 J**	**3.2 J**	**93**	<0.13	**0.33 J**	**19**	**5.6**	**29**	**81**	**0.093**	**0.77 J**	**18**	<0.58	<0.19	<0.56	**31**	**100**
DG-AJ8	2	0.5-1	DG-AJ8S-0.5-1	1/30/2019	**4.1**	**13**	**140**	<0.18 U	**6.3**	**45**	**18**	**330**	**460**	**0.3**	**3.9**	**46**	**5.6 U**	**0.41 J**	<0.81 U	**91**	**650**
DG-AJ8	2	3.5-4	DG-AJ8S-3.5-4	1/30/2019	**0.60 J**	**4.0**	**61**	<0.11 U	**0.053 J**	**23**	**6.2**	**21**	**25**	**0.029**	**0.37 J**	**24**	<0.52 U	<0.17 U	<0.50 U	**33**	**40**
DG-AJ9	2	0.5-1	DG-AJ9S-0.5-1	1/30/2019	**9.5**	**20**	**250**	**0.24 J**	**3.7**	**62**	**9.8**	**500**	**710**	**0.34**	**3.9**	**61**	<0.41	**1.2**	<0.40	**35**	**830**
DG-AJ9	2	3.5-4	DG-AJ9S-3.5-4	1/30/2019	<0.28	**4**	**72**	**0.25 J**	**0.064 J**	**20**	**5.2**	**17**	**22**	**0.025**	<0.21	**18**	**3.3 U**	<0.17	<0.48	**35**	**43**
DG-AK10	2	0.5-1	DG-AK10S-0.5-1	1/15/2019	**2.6**	**4.7**	**58**	<0.12	**1.1**	**39**	**9.4**	**130**	**300**	**0.88**	**1.5 J**	**13**	**1.1 J**	<0.19	<0.54	**81**	**490**
DG-AK10	2	3.5-4	DG-AK10S-3.5-4	1/15/2019	**0.74 J**	**7.0**	**55**	<0.095	**0.30 J**	**18**	**5.1**	**25**	**120**	**0.029**	**1.0 J**	**17**	<0.44	<0.15	<0.42	**30**	**78**
DG-AK2	2	0.5-1	DG-AK2S-0.5-1	12/14/2018	**1.2 J**	**7.7**	**86**	<0.088	**0.8**	**14**	**10**	**130**	**130**	**0.13**	**0.91 J**	**11**	**0.54 J**	<0.14	<0.39	**89**	**190**

Table 2: Metals Concentrations in Soil
Brisbane Baylands OU-2
Brisbane, California

Sample Location	Investigation Zone	Depth Range (ft bgs)	Sample Name	Collection Date	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
Direct Exposure Human Health Risk Level Residential Soil Exposure ESL [1]					1.1E+01	6.7E-02	1.5E+04	1.6E+01	7.8E+01	1.2E+05	2.3E+01	3.1E+03	8.0E+01	1.3E+01	3.9E+02	8.2E+02	3.9E+02	3.9E+02	7.8E-01	3.9E+02	2.3E+04
Regional Background [2]					5.5E+00	1.9E+01	3.2E+02	1.0E+00	2.7E+00	1.0E+02	2.5E+01	6.9E+01	1.6E+01	4.0E-01	7.4E+00	1.2E+02	5.6E+00	1.8E+00	7.6E+00	7.4E+01	1.1E+02
Units					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
DG-AK2	2	3.5-4	DG-AK2S-3.5-4	12/14/2018	**0.70 J**	**45**	**32**	<0.070	**0.20 J**	**7.9**	**11**	**84**	**15**	**0.071**	**0.55 J**	**4.7**	<0.32	<0.11	<0.31	**79**	**73**
DG-AK3	2	0.5-1	DG-AK3S-0.5-1	12/19/2018	**0.81 J**	**1.6 J**	**53**	**0.28**	**0.20 J**	**11**	**10**	**150**	**26**	**0.35**	**0.92 J**	**5.6**	**0.62 J**	<0.11	<0.32	**98**	**69**
DG-AK3	2	3.5-4	DG-AK3S-3.5-4	12/19/2018	**1.3 J**	**85**	**300**	**0.52**	**0.26 J**	**35**	**10**	**63**	**180**	**0.31**	**1.1 J**	**34**	<0.43	**0.23 J**	<0.42	**43**	**210**
DG-AK4	2	0.5-1	DG-AK4S-0.5-1	12/18/2018	<0.28 UJ	**4.1**	**74**	**0.19 J**	**0.13 J**	**7.5**	**13**	**100**	**3.5 J**	**0.046**	**0.49 J**	**4.1 J**	<0.51	<0.17	<0.50	**110**	**49**
DG-AK4	2	3.5-4	DG-AK4S-3.5-4	12/18/2018	**2.1 J**	**160 J**	**60 J**	**0.19 J**	**0.95**	**18 J**	**9.9 J**	**850 J**	**210 J**	**0.091**	**0.60 J**	**14 J**	**1.0 J**	<0.17 U	<0.50	**59 J**	**450 J**
DG-AK4 (D)	2	0.5-1	DG-AK4 (D)S-0.5-1	12/18/2018	**0.60 J**	**2.6**	**68**	**0.18 J**	**0.17 J**	**11**	**15**	**120**	**11 J**	**0.063**	**0.95 J**	**8.0 J**	<0.38	<0.13	<0.37	**120**	**70**
DG-AK5	2	0.5-1	DG-AK5S-0.5-1	12/17/2018	**2.9**	**7.7**	**91**	<0.11	**4.0**	**81**	**10**	**260**	**520**	**0.48**	**2.3**	**19**	<0.50	**0.50 J**	<0.49	**66**	**1,000**
DG-AK5	2	3.5-4	DG-AK5S-3.5-4	12/17/2018	**4.0**	**230**	**85**	<0.26	**0.95 J**	**16**	**7.9**	**300**	**370**	**0.19**	**0.56 J**	**21**	<1.2	<0.40	<1.2	**49**	**320**
DG-AK6	2	0.5-1	DG-AK6S-0.5-1	12/20/2018	**1.4 J**	**0.82 J**	**5.7**	**1.6**	**0.22 J**	**13**	**21**	**140**	**3.1**	**0.055**	**0.79 J**	**7.7**	**0.57 J**	<0.17	<0.48	**130**	**66**
DG-AK6	2	3.5-4	DG-AK6S-3.5-4	12/20/2018	**12**	**14**	**240**	**0.37**	**2.4**	**49**	**10**	**190**	**330**	**0.68**	**4.2**	**50**	**1.4 J**	<0.13	<0.37	**33**	**690**
DG-AK7	2	0.5-1	DG-AK7S-0.5-1	1/9/2019	**23**	**19**	**270**	**0.33**	**8.1**	**140**	**38**	**690**	**960**	**2.3**	**28**	**120**	**1.6**	**1.1**	**1.7**	**38**	**1,400**
DG-AK7	2	3.5-4	DG-AK7S-3.5-4	1/9/2019	**4.4**	**4.8**	**140**	**0.14**	**0.3**	**15**	**5.8**	**77**	**290**	**0.38**	**0.61**	**18**	**0.65**	**0.34**	<0.55	**26**	**230**
DG-AK7 (D)	2	3.5-4	DG-AK7 (D)S-3.5-4	1/9/2019	**0.76**	**3**	**65**	**0.12**	**0.096**	**13**	**4.4**	**20**	**44**	**0.04**	**0.37**	**14**	**0.57**	**0.18**	<0.37	**24**	**58**
DG-AK8	2	0.5-1	DG-AK8S-0.5-1	2/1/2019	**1.2 U**	**0.84 J**	**56**	<0.076	**0.57**	**24**	**9.5**	**120**	**69**	**0.55**	<0.15	**6.3**	**0.37 J**	**0.13 J**	**0.46**	**86**	**140**
DG-AK8	2	3.5-4	DG-AK8S-3.5-4	2/1/2019	<0.19	**5.3**	**62**	<0.073	**0.22 J**	**14**	**4.3**	**12**	**17**	**0.037**	<0.14	**14**	**0.41 J**	<0.11	<0.33	**19**	**32**
DG-AK9	2	0.5-1	DG-AK9S-0.5-1	1/30/2019	**7.4**	**15**	**220**	<0.11 U	**2.4**	**52**	**8.2**	**230**	**390**	**0.64**	**1.9**	**51**	**3.3 U**	**0.27 J**	**0.51 J**	**35**	**620**
DG-AK9	2	3.5-4	DG-AK9S-3.5-4	1/30/2019	**1.0 J**	**6.7**	**79**	<0.10 U	**0.15 J**	**16**	**4.6**	**22**	**170**	**0.03**	**0.73 J**	**19**	<0.48 U	<0.16 U	<0.47 U	**27**	**70**
DG-AL10	2	0.5-1	DG-AL10S-0.5-1	1/15/2019	<0.17	**0.45 J**	**30**	<0.067	**0.14 J**	**11**	**9.6**	**120**	**6.4**	**0.068**	**0.52 J**	**3.9**	**0.69 J**	<0.10	<0.30	**100**	**50**
DG-AL10	2	3.5-4	DG-AL10S-3.5-4	1/15/2019	<0.27	**6.3**	**41**	<0.11	**0.30 J**	**20**	**5.4**	**21**	**30**	**0.025**	**0.40 J**	**15**	<0.49	<0.17	<0.48	**33**	**47**
DG-AL2	2	0.5-1	DG-AL2S-0.5-1	12/17/2018	<0.25	**7.2**	**37**	<0.097	<0.037	**6.3**	**7.1**	**110**	**9.9**	**0.078**	**0.27 J**	**2.6**	<0.45	<0.15	<0.43	**70**	**36**
DG-AL2	2	3.5-4	DG-AL2S-3.5-4	12/17/2018	**3.0**	**280**	**71**	**0.11 J**	**0.62**	**23**	**11**	**250**	**230**	**0.28**	**0.25 J**	**16**	<0.43	**0.23 J**	<0.41	**72**	**200**
DG-AL2	2	7.5-8	DG-AL2S-7.5-8	12/17/2018	**1.9**	**35**	**76**	**0.29**	**0.045 J**	**64**	**16**	**29**	**5.3**	**0.31**	<0.18	**81**	<0.43	<0.14	<0.41	**52**	**56**
DG-AL3	2	0.5-1	DG-AL3S-0.5-1	11/21/2018	**2.4**	**11**	**76**	<0.099	**0.92**	**9.5**	**7.5**	**160**	**420**	**0.35**	**0.52 J**	**9.3**	<0.46	**0.91**	<0.44	**75**	**240**
DG-AL3	2	3.5-4	DG-AL3S-3.5-4	11/21/2018	**4.1 J**	**310 J**	**39**	<0.094	**0.46 J**	**11**	**9.5**	**120**	**200 J**	**0.089**	<0.19 UJ	**15 J**	<0.43	**0.95 J**	<0.42	**79**	**130 J**
DG-AL3 (D)	2	3.5-4	DG-AL3 (D)S-3.5-4	11/21/2018	**1.2 J**	**97 J**	**42**	<0.12	**0.31 J**	**8.6**	**10**	**77**	**40 J**	**0.13**	**0.37 J**	**6.7 J**	<0.55	**0.91 UJ**	<0.53	**91**	**69 J**
DG-AL4	2	0.5-1	DG-AL4S-0.5-1	12/18/2018	**0.44 J**	**72**	**86**	**0.096 J**	**0.15 J**	**12**	**7.7**	**120**	**59**	**0.28**	**0.50 J**	**5.0**	<0.44	<0.15	<0.42	**80**	**200**
DG-AL4	2	3.5-4	DG-AL4S-3.5-4	12/18/2018	**3.2**	**17**	**110**	<0.081	**2.9**	**37**	**9.2**	**120**	**260**	**0.28**	**2.9**	**47**	<0.37	**0.42 J**	<0.36	**35**	**330**
DG-AL4	2	7.5-8	DG-AL4S-7.5-8	12/18/2018	**4.9**	**27**	**290**	**0.56**	**0.18 J**	**25**	**11**	**41**	**260**	**0.16**	**0.28 J**	**32**	<0.57	**0.67 J**	<0.55	**28**	**160**
DG-AL5	2	0.5-1	DG-AL5S-0.5-1	1/30/2019	**2.5 J-**	**9.1**	**96 J**	<0.10	**1.2**	**26**	**8.5**	**140 J+**	**220**	**0.34**	**2.4**	**29**	**1.6 J**	**0.77 U**	<0.45	**52**	**240**
DG-AL5	2	3.5-4	DG-AL5S-3.5-4	1/30/2019	**5.4**	**68**	**66**	**0.23 J**	**1.1**	**22**	**7.5**	**320**	**330**	**0.4**	**1.6**	**30**	<0.47	**0.29 J**	<0.45 UJ	**47**	**350**
DG-AL5 (D)	2	3.5-4	DG-AL5 (D)S-3.5-4	1/30/2019	**4.1**	**75**	**100**	**0.25 J**	**1.4**	**27**	**8.1**	**260**	**370**	**0.55**	**1.5**	**34**	**2.6 U**	**0.17 J**	<0.37	**56**	**420**
DG-AL6	2	0.5-1	DG-AL6S-0.5-1	12/20/2018	**1.7**	**1.8 J**	**27**	**1.6**	**0.85**	**21**	**19**	**170**	**80**	**0.12**	**1.5 J**	**14**	**1.2 J**	<0.16	<0.46	**130**	**170**
DG-AL6	2	3.5-4	DG-AL6S-3.5-4	12/20/2018	**3.2**	**35**	**100**	**1.3**	**1.2**	**30**	**14**	**150**	**200**	**0.18**	**1.5 J**	**23**	**0.62 J**	<0.19	<0.55	**100**	**290**
DG-AL7	2	0.5-1	DG-AL7S-0.5-1	12/19/2018	**20**	**17**	**300**	<0.078	**12**	**300**	**16**	**390**	**1,000**	**0.059**	**67**	**240**	**1.6 J**	**0.62 J**	<0.87	**34**	**1,200**
DG-AL7	2	14.5-15	DG-AL7S-14.5-15	12/19/2018	**7.7**	**17**	**440**	**0.26 J**	**1.7**	**49**	**8.2**	**220**	**1,200**	**0.063**	**0.52 J**	**36**	**1.7 J**	**1.3 J**	<1.1	**34**	**1,100**
DG-AL7	2	3.5-4	DG-AL7S-3.5-4	12/19/2018	**0.93 J**	**6.4**	**85**	<0.12	**0.13 J**	**16**	**6.6**	**22**	**32**	**0.036**	**0.70 J**	**22**	<0.54	<0.18	<0.52	**40**	**140**
DG-AL8	2	0.5-1	DG-AL8S-0.5-1	1/30/2019	**5.7**	**21**	**110**	**0.41**	**3.8**	**39**	**12**	**310**	**230**	**0.63**	**1.9**	**53**	**0.96 J**	**0.66 J**	<0.53 U	**61**	**420**
DG-AL8	2	3.5-4	DG-AL8S-3.5-4	1/30/2019	**0.88 J**	**5.1**	**75**	**0.18 J**	**0.21 J**	**13**	**4.6**	**29**	**55**	**0.038**	**0.28 J**	**14**	**0.99 J**	<0.12 U	<0.33 U	**26**	**120**
DG-AL9	2	0.5-1	DG-AL9S-0.5-1	1/21/2019	**2.9 J-**	**9.9 J**	**83 J**	<0.073	**1.1**	**30 J**	**8.9 J**	**120 J**	**170 J**	**0.19**	**1.1**	**30 J**	<0.34	**0.41 J**	**1.1 U**	**43 J**	**270 J**
DG-AL9	2	3.5-4	DG-AL9S-3.5-4	1/21/2019	**23**	**22**	**1,300**	**0.31**	**2.9**	**47**	**7.6**	**530**	**4,600**	**0.51**	**0.25 J**	**42**	<0.47	**6.2**	<0.45	**29**	**3,800**
DG-AL9	2	7-7.5	DG-AL9S-7-7.5	1/21/2019	**3.4**	**9.9**	**100**	**0.44 J**	**0.57**	**24**	**12 J**	**49**	**18 J**	**0.027 J**	<0.23	**34**	<0.55	<0.18	<0.53	**31**	**130 J**
DG-AL9 (D)	2	7-7.5	DG-AL9 (D)S-7-7.5	1/21/2019	**3.0**	**14**	**110**	**0.88 J**	**0.72**	**36**	**22 J**	**73**	**37 J**	**0.053 J**	<0.20	**48**	<0.47	<0.16	<0.45	**42**	**410 J**
DG-AM10	2	0.5-1	DG-AM10S-0.5-1	1/15/2019	**0.32 J**	**4.0 J**	**67 J**	<0.086	**0.84 J**	**17 J**	**6.9**	**92**	**120 J**	**0.26 J**	**1.1 J**	**11 J**	<0.39	<0.13	<0.38	**48 J**	**270 J**
DG-AM10	2	3.5-4	DG-AM10S-3.5-4	1/15/2019	<0.19	**0.49 J**	**30**	<0.073	**0.080 J**	**16**	**9.6**	**190**	**30**	**0.064**	**0.70 J**	**4.7**	**0.40 J**	<0.11	<0.32	**83**	**140**
DG-AM10 (D)	2	0.5-1	DG-AM10 (D)S-0.5-1	1/15/2019	**1.6 U**	**0.41 J**	**36 J**	<0.10	**0.12 J**	**10 J**	**9.4**	**100**	**3.3 J**	**0.060 J**	<0.20 UJ	**3.6 J**	<0.48	<0.16	<0.46	**100 J**	**31 J**
DG-AM2	2	0.5-1	DG-AM2S-0.5-1	12/17/2018	<0.26	**9.5**	**33**	<0.10	<0.039	**12**	**11**	**130**	**0.82 J**	**0.097**	<0.20	**4.5**	<0.47	<0.16	<0.45	**110**	**32**
DG-AM2	2	3.5-4	DG-AM2S-3.5-4	12/17/2018	**0.38 J**	**11**	**47**	<0.10	**0.30 J**	**7.7**	**7.9**	**90**	**68**	**0.06**	**0.28 J**	**4.3**	<0.48	<0.16	<0.46	**68**	**110**
DG-AM3	2	0.5-1	DG-AM3S-0.5-1	12/19/2018	**1.9**	**13**	**57**	<0.068	**0.59**	**17**	**9.8**	**130**	**140**	**0.098**	**1.1**	**16**	<0.32	<0.11	<0.31	**85**	**190**
DG-AM3	2	3.5-4	DG-AM3S-3.5-4	12/19/2018	**1.3**	**140**	**88**	**0.16 J**	**0.36**	**28**	**12**	**75**	**51**	**0.1**	**0.66 J**	**37**	**0.55 J**	<0.13	<0.37	**58**	**93**
DG-AM4	2	0.5-1	DG-AM4S-0.5-1	12/18/2018	**0.79 J**	**14**	**47**	<0.11	**0.26 J**	**15**	**15**	**120**	**47**	**0.098**	**1.2 J**	**10**	**0.75 J**	<0.17	<0.50	**120**	**110**
DG-AM4	2	3.5-4	DG-AM4S-3.5-4	12/18/2018	**0.67 J**	**160**	**130**	**0.44**	**0.39**	**100**	**23**	**50**	**140**	**0.18**	**0.48 J**	**72**	**0.42 J**	<0.14	<0.40	**67**	**220**
DG-AM5	2	0.5-1	DG-AM5S-0.5-1	12/17/2018	**3.3**	**6.4**	**68**	<0.11	**1.7**	**39**	**13**	**240**	**790**	**0.18**	**2.7**	**23**	**0.58 J**	**0.9**	<0.49	**86**	**1,300**
DG-AM5	2	3.5-4	DG-AM5S-3.5-4	12/17/2018	**1.6 U**	**5.9**	**30**	<0.11	<0.041	**10**	**12**	**150**	**8.9**	**0.033**	<0.21	**4.4**	<0.49	<0.17	<0.48	**140**	**52**

Table 2: Metals Concentrations in Soil
Brisbane Baylands OU-2
Brisbane, California

Sample Location	Investigation Zone	Depth Range (ft bgs)	Sample Name	Collection Date	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
Direct Exposure Human Health Risk Level Residential Soil Exposure ESL [1]					1.1E+01	6.7E-02	1.5E+04	1.6E+01	7.8E+01	1.2E+05	2.3E+01	3.1E+03	8.0E+01	1.3E+01	3.9E+02	8.2E+02	3.9E+02	3.9E+02	7.8E-01	3.9E+02	2.3E+04
Regional Background [2]					5.5E+00	1.9E+01	3.2E+02	1.0E+00	2.7E+00	1.0E+02	2.5E+01	6.9E+01	1.6E+01	4.0E-01	7.4E+00	1.2E+02	5.6E+00	1.8E+00	7.6E+00	7.4E+01	1.1E+02
Units					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
DG-AM6	2	0.5-1	DG-AM6S-0.5-1	12/20/2018	**1.4**	<0.24	**7.4**	**2.0**	**0.13 J**	**16**	**21**	**110**	**1.5**	**0.084**	**0.73 J**	**8.1**	**0.63 J**	<0.14	<0.41	**160**	**63**
DG-AM6	2	3.5-4	DG-AM6S-3.5-4	12/20/2018	**4.0**	**68**	**83**	**0.59**	**1.2**	**28**	**11**	**170**	**270**	**0.14**	**1.6**	**43**	**0.80 J**	<0.15	<0.44	**59**	**230**
DG-AM7	2	0.5-1	DG-AM7S-0.5-1	1/9/2019	**13**	**15**	**280**	**0.18**	**8**	**58**	**15**	**490**	**930**	**0.9**	**9.3**	**89**	**3.4**	**0.79**	<0.50	**35**	**1,400**
DG-AM7	2	3.5-4	DG-AM7S-3.5-4	1/9/2019	**1.2**	**4.9**	**96**	**0.19**	**0.58**	**15**	**5.4**	**43**	**120**	**0.046**	**0.53**	**14**	**0.69**	**0.18**	<0.45	**32**	**130**
DG-AM7	2	7.5-8	DG-AM7S-7.5-8	1/9/2019	**14**	**43**	**420**	**0.67**	**0.82**	**60**	**13**	**470**	**28,000**	**0.23**	**3.2**	**48**	**3.3**	**3.7**	<1.1	**24**	**990**
DG-AM8	2	0.5-1	DG-AM8S-0.5-1	1/30/2019	**5.7**	**20**	**73**	**0.20 J**	**4.4**	**35**	**7.2**	**270**	**270**	**0.54**	**1.5 J**	**44**	**1.6 J**	**0.60 J**	**0.78 J**	**35**	**550**
DG-AM8	2	3.5-4	DG-AM8S-3.5-4	1/30/2019	**75 J**	**35 J**	**1,100**	**0.37**	**15 J**	**75 J**	**8.4 J**	**1,600 J**	**8,700 J**	**0.039**	**0.57 J**	**55 J**	<1.9 U	**4.5 J**	<1.8 UJ	**29 J**	**17,000 J**
DG-AM8 (D)	2	0.5-1	DG-AM8 (D)S-0.5-1	1/30/2019	**0.82 J**	**3.7 J**	**84**	**0.19 J**	**0.17 J**	**19 J**	**6.0 J**	**35 J**	**47 J**	**0.035 J**	<0.15 UJ	**18 J**	<0.36 UJ	**0.15 J**	<0.35 U	**26 J**	**100 J**
DG-AM9	2	0.5-1	DG-AM9S-0.5-1	1/30/2019	**8.1**	**16**	**220**	<0.083 U	**3.9**	**71**	**14**	**490**	**680**	**0.3**	**6**	**130**	**3.8**	**0.42 J**	**0.82 J**	**38**	**1,300**
DG-AM9	2	3.5-4	DG-AM9S-3.5-4	1/30/2019	**34**	**24 J**	**1,300**	<1.0 U	**3.1 J**	**58**	**14**	**630**	**4,300**	**2.5**	**0.79 J**	**49**	<4.7 U	**5.4 J**	<4.6 U	**37**	**2,400**
DG-AN10	2	0.5-1	DG-AN10S-0.5-1	1/15/2019	**1.8**	**8.6**	**87**	<0.11	**2.3**	**23**	**13**	**200**	**240**	**0.17**	**1.4 J**	**18**	**1.0 J**	**0.18 J**	<0.48	**95**	**600**
DG-AN10	2	3.5-4	DG-AN10S-3.5-4	1/15/2019	**34**	**18**	**1,100**	**0.32 J**	**3.7**	**52**	**6.2**	**570**	**5,100**	**1.9**	**2.7**	**44**	**1.4 J**	**6.3**	**0.55 J**	**24**	**2,400**
DG-AN2	2	0.5-1	DG-AN2S-0.5-1	12/17/2018	**0.34 J**	**0.80 J**	**24**	<0.10	<0.040	**8.8**	**13**	**140**	**6.6**	**0.034**	<0.21	**3.8**	<0.48	**0.18 J**	<0.47	**130**	**48**
DG-AN2	2	3.5-4	DG-AN2S-3.5-4	12/17/2018	**0.65 J**	**30 J**	**35 J**	<0.080	**0.18 J**	**7.0 J**	**9.1 J**	**88 J**	**23 J**	**0.047**	<0.16	**3.7**	<0.37	<0.12	<0.36	**72**	**55**
DG-AN2 (D)	2	0.5-1	DG-AN2 (D)S-0.5-1	12/17/2018	<0.26 UJ	<0.27 UJ	**28**	<0.10	<0.039	**7.5**	**12**	**130**	**6.5**	**0.044**	<0.20	**3.8**	<0.48	<0.16 UJ	<0.46	**110**	**52**
DG-AN3	2	0.5-1	DG-AN3S-0.5-1	12/14/2018	**2.9**	**23**	**45**	<0.097	**0.61**	**16**	**11**	**190**	**240**	**0.14**	**1.2 J**	**12**	**0.93 J**	<0.15	<0.43	**96**	**180**
DG-AN3	2	3.5-4	DG-AN3S-3.5-4	12/14/2018	**2.8 J**	**270 J**	**79 J**	**0.13 J**	**0.4**	**24 J**	**12 J**	**94 J-**	**100 J**	**0.11**	**2.4**	**34 J**	<0.38	**0.63 U**	<0.37	**67 J**	**110 J**
DG-AN4	2	0.5-1	DG-AN4S-0.5-1	12/17/2018	**8.8**	**36**	**150**	**0.10 J**	**5.0**	**66**	**15**	**2400**	**750**	**0.92**	**6.5**	**73**	<0.43	**0.85**	<0.41	**36**	**710**
DG-AN4	2	3.5-4	DG-AN4S-3.5-4	12/17/2018	**11**	**160**	**180**	**0.23 J**	**2.9**	**24**	**8.7**	**220**	**880**	**0.75**	**0.27 J**	**25**	<0.55	**0.67 J**	<0.53	**45**	**830**
DG-AN5	2	0.5-1	DG-AN5S-0.5-1	12/20/2018	<120	**200 J**	**23,000**	**120 J**	**51 J**	**4700**	**4400**	**62,000**	**4,600**	**0.071**	**250 J**	**1800**	<220	<73	<210	**45000**	**18,000**
DG-AN5	2	3.5-4	DG-AN5S-3.5-4	12/20/2018	<2.0	**83**	**810**	<0.39	<0.30	**12 U**	**10**	**96**	**12 U**	**0.031**	<0.78	**3.8 J**	<3.6	<1.2	<3.5	**81**	**36**
DG-AN6	2	0.5-1	DG-AN6S-0.5-1	12/21/2018	**1.2**	**2.3 U**	**18**	**1.7**	**0.38**	**9.9**	**18**	**110**	**15**	**0.063**	**0.89 J**	**6.6**	**0.36 J**	<0.12	<0.33	**140**	**77**
DG-AN6	2	3.5-4	DG-AN6S-3.5-4	12/21/2018	**12 J**	**71 J**	**200 J**	**0.87**	**3.5 J**	**55**	**14**	**270 J**	**740 J**	**0.35 J**	**5.2**	**52**	**2.9 J**	**0.64 J**	<0.44	**66**	**590 J**
DG-AN7	2	0.5-1	DG-AN7S-0.5-1	12/19/2018	**10**	**15**	**230**	<0.10	**7.2**	**86**	**12**	**500**	**870**	**0.97**	**8.4**	**96**	**1.2 J**	**0.98**	<0.47	**28**	**1,300**
DG-AN7	2	3.5-4	DG-AN7S-3.5-4	12/19/2018	**0.64 J**	**3.3**	**66**	<0.11	**0.070 J**	**12**	**4.9**	**17**	**19**	**0.03**	<0.21	**15**	**0.69 J**	<0.17	<0.48	**28**	**55**
DG-AN8	2	3.5-4	DG-AN8S-3.5-4	1/15/2019	**0.46 J**	**4.6**	**61**	**0.33 J**	**0.21 J**	**20**	**6.3**	**18**	**7.9**	**0.016**	**0.60 J**	**13**	**1.1 J**	<0.20	<0.56 UJ	**54**	**40**
DG-AN9	2	0.5-1	DG-AN9S-0.5-1	1/21/2019	**2.3**	**6.4**	**99**	<0.090	**1.3**	**82**	**21**	**94**	**150**	**0.52**	**0.96 J**	**130**	<0.41	<0.14	<0.40	**34**	**210**
DG-AN9	2	3.5-4	DG-AN9S-3.5-4	1/21/2019	**21**	**33**	**1,400**	**0.21 J**	**0.79 J**	**33**	**14**	**380**	**980**	**0.11**	**0.60 J**	**84**	<1.4	<0.48	<1.4	**31**	**200**
DG-AN9	2	7-7.5	DG-AN9S-7-7.5	1/21/2019	**2.3**	**7.6**	**38**	**0.45**	**0.41**	**35**	**22**	**42**	**27**	**0.034**	<0.16	**47**	**2.5 U**	<0.13	<0.37	**45**	**110**
DG-AO10	2	0.5-1	DG-AO10S-0.5-1	1/15/2019	**2.9 J**	**4.7**	**170 J**	<0.090	**1.6**	**28 J**	**11 J**	**180 J**	**320 J**	**0.19**	**1.1 J**	**12 J**	**1.7 J**	**0.24 J**	<0.40	**81 J**	**630 J**
DG-AO10	2	3.5-4	DG-AO10S-3.5-4	1/15/2019	**45**	**40**	**1,200**	<0.30	**4.2**	**59**	**11**	**1,400**	**4,300**	**1.1**	**4.5**	**65**	**12**	**4.2**	**1.5 J**	**23**	**3,300**
DG-AO2	2	0.5-1	DG-AO2S-0.5-1	12/17/2018	**1.0 J**	**4.1**	**71**	<0.11	<0.042	**10**	**13**	**140**	**74**	**0.069**	<0.22	**6.3**	<0.50	<0.17	<0.49	**110**	**88**
DG-AO2	2	3.5-4	DG-AO2S-3.5-4	12/17/2018	**2.9**	**350**	**100**	<0.077	**0.9**	**20**	**10**	**210**	**390**	**0.23**	**0.35 J**	**26**	**0.61 J**	**0.72**	<0.35	**67**	**270**
DG-AO3	2	0.5-1	DG-AO3S-0.5-1	12/19/2018	**0.76 J**	**3.9**	**39**	<0.086	**0.33**	**14**	**7.5**	**140**	**64**	**0.1**	**0.70 J**	**14**	<0.40	<0.13	<0.38	**81**	**110**
DG-AO3	2	3.5-4	DG-AO3S-3.5-4	12/19/2018	**2.7**	**230**	**190**	**0.51**	**0.27 J**	**31**	**16**	**72**	**43**	**0.07**	**1.5**	**48**	**1.8 J**	<0.15	<0.43	**37**	**110**
DG-AO4	2	0.5-1	DG-AO4S-0.5-1	12/17/2018	**0.69 J**	**0.69 J**	**30**	<0.074	**0.059 J**	**8.2**	**14**	**81**	**6.1**	**0.057**	<0.15	**4.1**	<0.34	<0.11	<0.33	**97**	**77**
DG-AO4	2	3.5-4	DG-AO4S-3.5-4	12/17/2018	**1.2 J**	**140**	**100**	**0.19 J**	**1.4**	**35**	**8.4**	**51 J**	**120 J**	**0.25 J**	<0.13 UJ	**24**	<0.31	**0.37 J**	<0.30	**43**	**400 J**
DG-AO4 (D)	2	3.5-4	DG-AO4 (D)S-3.5-4	12/17/2018	**1.0 J**	**230**	**77**	**0.19 J**	**1.1**	**45**	**7.7**	**12 J**	**24 J**	**0.55 J**	**0.17 J**	**23**	<0.35	<0.12 UJ	<0.34	**38**	**72 J**
DG-AO5	2	0.5-1	DG-AO5S-0.5-1	12/17/2018	**2.1**	**2.0 J**	**120**	<0.081	**0.4**	**11**	**11**	**170**	**270**	**0.15**	**0.45 J**	**8.0**	<0.38	**0.45 J**	<0.36	**95**	**1,100**
DG-AO5	2	3.5-4	DG-AO5S-3.5-4	12/17/2018	<0.27	**24**	**67**	<0.10	<0.040	**7.7**	**9.4**	**160**	**5.8**	**0.094**	<0.21	**3.6**	<0.48	<0.16	<0.47	**89**	**39**
DG-AO6	2	0.5-1	DG-AO6S-0.5-1	12/21/2018	**5.7**	**13**	**94**	**1.5**	**4.8**	**56**	**19**	**290**	**560**	**0.64**	**7.2**	**47**	**2.3 J**	<0.19	<0.54	**120**	**530**
DG-AO6	2	3.5-4	DG-AO6S-3.5-4	12/21/2018	**7.7**	**35**	**190**	**0.74**	**2.4**	**35**	**9.9**	**230**	**670**	**0.3**	**2.7**	**38**	**1.4 J**	<0.12	<0.35	**51**	**390**
DG-AO7	2	0.5-1	DG-AO7S-0.5-1	1/9/2019	**39**	**16**	**350**	**0.19**	**3.4**	**40**	**8.9**	**350**	**410**	**0.42**	**3.1**	**67**	**1.5**	**0.49**	<0.46	**36**	**530**
DG-AO7	2	3.5-4	DG-AO7S-3.5-4	1/9/2019	**1.9**	**3.5**	**61**	**0.11**	**0.099**	**13**	**5.6**	**15**	**350**	**0.033**	**0.34**	**17**	**0.4**	<0.13	<0.36	**30**	**39**
DG-AO8	2	0.5-1	DG-AO8S-0.5-1	1/30/2019	**1.3 J**	**14 J**	**100 J**	**0.16 J**	**2.5 J**	**15 J**	**4.7 J**	**1,800 J**	**72 J**	**0.05**	**0.26 J**	**15 J**	<0.48 U	**0.20 J**	<0.47 U	**25 J**	**240 J**
DG-AO8	2	3.5-4	DG-AO8S-3.5-4	1/30/2019	**9.7 J**	**24**	**320 J**	**0.13 J**	**5.4**	**38**	**12**	**1,800 J**	**1,400 J**	**0.71 J**	**0.87 J**	**75**	<0.99 UJ	**1.3 J**	<0.95 U	**20**	**1,500 J**
DG-AO8 (D)	2	3.5-4	DG-AO8 (D)S-3.5-4	1/30/2019	**25 J**	**33**	**780 J**	**0.34 J**	**6.9**	**46**	**8.9**	**820 J**	**7,200 J**	**2.8 J**	**1.3 J**	**66**	**3.7 J**	**2.9 J**	<0.91 U	**24**	**3,300 J**
DG-AO9	2	0.5-1	DG-AO9S-0.5-1	1/30/2019	**5.4**	**6.2**	**120**	<0.098 U	**1.8**	**150**	**13**	**210**	**220**	**0.94**	**1.4 J**	**84**	**3.0 U**	<0.15 U	**0.74 J**	**44**	**460**
DG-AO9	2	3.5-4	DG-AO9S-3.5-4	1/30/2019	**5.0**	**26**	**190**	<0.070 U	**0.8**	**22**	**18**	**280**	**240**	**0.069**	**0.59 J**	**75**	**2.4**	**0.28 J**	**0.57 J**	**39**	**620**
DG-AP2	2	0.5-1	DG-AP2S-0.5-1	12/17/2018	<0.18	**1.2 J**	**33**	<0.071	<0.027	**8.4**	**7.3**	**100**	**8.5**	**0.2**	**0.25 J**	**3.2**	<0.33	**0.13 J**	<0.32	**68**	**31**
DG-AP2	2	3.5-4	DG-AP2S-3.5-4	12/17/2018	**4.9**	**360**	**120**	<0.090	**0.65**	**25**	**18**	**340**	**340**	**0.37**	**0.53 J**	**28**	**0.94 J**	**4.2**	<0.40	**73**	**280**
DG-AP3	2	0.5-1	DG-AP3S-0.5-1	12/14/2018	<0.22	**0.41 J**	**38**	<0.084	<0.032	**5.5**	**9.4**	**95**	**9.6**	**0.054**	<0.17	**3.2**	<0.39	**0.65 U**	<0.38	**82**	**39**
DG-AP3	2	3.5-4	DG-AP3S-3.5-4	12/14/2018	**1.1 U**	**180**	**31**	<0.071	**0.18 J**	**6.5**	**7.6**	**110**	**520**	**0.067**	<0.14	**6.7**	<0.33	**2.7**	<0.32	**67**	**130**

Table 2: Metals Concentrations in Soil
Brisbane Baylands OU-2
Brisbane, California

Sample Location	Investigation Zone	Depth Range (ft bgs)	Sample Name	Collection Date	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
Direct Exposure Human Health Risk Level Residential Soil Exposure ESL [1]					1.1E+01	6.7E-02	1.5E+04	1.6E+01	7.8E+01	1.2E+05	2.3E+01	3.1E+03	8.0E+01	1.3E+01	3.9E+02	8.2E+02	3.9E+02	3.9E+02	7.8E-01	3.9E+02	2.3E+04
Regional Background [2]					5.5E+00	1.9E+01	3.2E+02	1.0E+00	2.7E+00	1.0E+02	2.5E+01	6.9E+01	1.6E+01	4.0E-01	7.4E+00	1.2E+02	5.6E+00	1.8E+00	7.6E+00	7.4E+01	1.1E+02
Units					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
DG-AP4	2	0.5-1	DG-AP4S-0.5-1	12/17/2018	**0.57 J**	**0.69 J**	**29**	<0.083	**0.055 J**	**6.9**	**12**	**78**	**4.8**	**0.036**	<0.16	**2.8**	<0.38	<0.13	<0.37	**83**	**38**
DG-AP4	2	3.5-4	DG-AP4S-3.5-4	12/17/2018	**2.0**	**190**	**100**	**0.17 J**	**0.89**	**39**	**8.9**	**85**	**320**	**0.37**	<0.16	**23**	<0.38	**0.22 J**	<0.37	**43**	**840**
DG-AP5	2	0.5-1	DG-AP5S-0.5-1	12/20/2018	**13**	**2.7 J**	**68**	**0.25 J**	**0.53**	**13**	**12**	**130**	**62**	**0.14**	**1.3 J**	**10**	<0.48	<0.16	<0.46	**97**	**120**
DG-AP5	2	3.5-4	DG-AP5S-3.5-4	12/20/2018	**0.82 J**	**19**	**59**	**0.23 J**	**0.20 J**	**26**	**4.4**	**23**	**64**	**0.013 J**	<0.17	**21**	<0.39	<0.13	<0.37	**21**	**62**
DG-AP6	2	0.5-1	DG-AP6S-0.5-1	12/21/2018	**8.5**	**22**	**170**	**0.71**	**5.8**	**73**	**12**	**420**	**530**	**0.8**	**8.3**	**68**	**2.0 J**	**0.82**	<0.33	**50**	**920**
DG-AP6	2	3.5-4	DG-AP6S-3.5-4	12/21/2018	**5.1**	**64**	**460**	**0.42**	**2.1**	**36**	**8.6**	**130**	**460**	**0.12**	**1.4 J**	**33**	**0.99 J**	**1.0**	<0.50	**35**	**670**
DG-AP7	2	0.5-1	DG-AP7S-0.5-1	12/19/2018	**14**	**34**	**440**	<0.094	**9.9**	**73**	**21**	**450**	**810**	**1.9**	**15**	**88**	**2.8 J**	**0.46 J**	<1.0	**30**	**1,400**
DG-AP7	2	3.5-4	DG-AP7S-3.5-4	12/19/2018	**1.3 J**	**5.2**	**61**	**0.24 J**	**0.12 J**	**15**	**5.3**	**15**	**7.2 J**	**0.019**	<0.18	**16**	<0.42	<0.14	<0.41	**32**	**35**
DG-AP7 (D)	2	3.5-4	DG-AP7 (D)S-3.5-4	12/19/2018	**1.3**	**5.2**	**60**	**0.19 J**	**0.19 J**	**18**	**4.9**	**19**	**13 J**	**0.022**	<0.17	**16**	<0.40	<0.13	<0.39	**29**	**49**
DG-AP8	2	0.5-1	DG-AP8S-0.5-1	12/21/2018	**1.4 J**	**6.6**	**93**	**0.19 J**	**0.25 J**	**11**	**4.9**	**33**	**60**	**0.07**	<0.23	**10**	<0.54	<0.18	<0.52	**25**	**120**
DG-AP8	2	3.5-4	DG-AP8S-3.5-4	12/21/2018	**19**	**21**	**1,100**	**0.16 J**	**3**	**54**	**11**	**530**	**2,400**	**0.8**	**0.91 J**	**40**	<1.2	**4.0**	**1.6 J**	**20**	**2,200**
DG-AP9	2	0.5-1	DG-AP9S-0.5-1	1/21/2019	**1.6 U**	**1.2 J**	**41**	<0.11	**2.2**	**9.7**	**9.4**	**110**	**33**	**0.048**	<0.21	**5.4**	**3.3 U**	<0.17	<0.48	**88**	**60**
DG-AP9	2	3.5-4	DG-AP9S-3.5-4	1/21/2019	**41**	**41**	**1,100**	**0.20 J**	**4.3**	**80**	**15**	**840**	**6100**	**0.18**	**1.5**	**70**	<2.3	**5.9**	<2.2	**27**	**3,000**
DG-AQ2	2	0.5-1	DG-AQ2S-0.5-1	12/17/2018	**0.44 J**	**7.6**	**25 J**	**0.10 J**	**0.11 J**	**10 J**	**10 J**	**93 J+**	**20 J**	**0.077**	<0.18	**4.8**	<0.42	<0.14	<0.40	**72 J**	**42**
DG-AQ2	2	3.5-4	DG-AQ2S-3.5-4	12/17/2018	**4.2**	**210**	**270**	**0.44 J**	**0.82 J**	**27**	**9.2**	**250 J**	**600**	**0.31**	**0.26 J**	**28**	<0.56	**0.24 J**	<0.54	**32**	**630**
DG-AQ2	2	7.5-8	DG-AQ2S-7.5-8	12/17/2018	**1.8**	**38**	**94**	**0.12 J**	<0.031	**76**	**14**	**27**	**10**	**2.1**	<0.16	**110**	<0.37	<0.13	<0.36	**52**	**49**
DG-AQ2 (D)	2	3.5-4	DG-AQ2 (D)S-3.5-4	12/17/2018	**3.2**	**150**	**220**	**0.25 J**	**0.44 J**	**21**	**5.7**	**120 J**	**400**	**0.33**	<0.21 UJ	**20**	<0.50	<0.17 UJ	<0.48	**22**	**470**
DG-AQ3	2	0.5-1	DG-AQ3S-0.5-1	12/19/2018	<0.22	**0.60 J**	**23**	**0.29**	**0.038 J**	**5.1**	**7**	**150**	**2.7**	**0.045**	**0.33 J**	**3.6**	**1.2 J**	<0.14	<0.39	**62**	**22**
DG-AQ3	2	3.5-4	DG-AQ3S-3.5-4	12/19/2018	**0.88 J**	**52**	**130**	**0.089 J**	**0.25 J**	**23**	**12**	**39**	**45**	**0.062**	**0.58 J**	**37**	**0.68 J**	<0.13	<0.36	**25**	**82**
DG-AQ4	2	0.5-1	DG-AQ4S-0.5-1	12/17/2018	**0.27 J**	**5.1**	**34**	<0.10	<0.039	**11**	**11**	**120**	**6.7**	**0.05**	<0.20	**3.6**	<0.47	<0.16	<0.46	**84**	**40**
DG-AQ4	2	3.5-4	DG-AQ4S-3.5-4	12/17/2018	**3.5**	**190**	**140**	**0.12 J**	**1.4**	**24**	**7.7**	**110**	**420**	**0.24**	<0.16	**15**	<0.37	**0.42 J**	<0.36	**45**	**770**
DG-AQ4	2	9-9.5	DG-AQ4S-9-9.5	12/17/2018	**1.4 J**	**6**	**59**	**0.31 J**	<0.044	**29**	**8.7**	**6.5**	**0.95 J**	**0.014 J**	**0.52 J**	**21**	<0.54	<0.18	<0.52	**39**	**29**
DG-AQ5	2	0.5-1	DG-AQ5S-0.5-1	12/17/2018	**1.6 U**	**0.29 J**	**22**	<0.10	<0.039	**12**	**14**	**110**	**1.2 J**	**0.073**	**0.79 J**	**5.2**	<0.47	**0.19 J**	<0.46	**110**	**45**
DG-AQ5	2	3.5-4	DG-AQ5S-3.5-4	12/17/2018	**1.5 U**	**13**	**49**	<0.10	<0.038	**8.5**	**15**	**120**	**46**	**0.022**	<0.20	**5.6**	<0.46	<0.16	<0.45	**110**	**67**
DG-AQ5 (D)	2	0.5-1	DG-AQ5 (D)S-0.5-1	12/17/2018	**1.5 U**	**0.74 J**	**20**	<0.098	<0.037	**9.8**	**14**	**100**	**1.7 J**	**0.074**	**0.80 J**	**4.4**	<0.45	**0.27 J**	<0.44	**110**	**45**
DG-AQ6	2	0.5-1	DG-AQ6S-0.5-1	12/21/2018	**2.8**	**9.1**	**210**	**0.66**	**1.6**	**37**	**8.6**	**150**	**320**	**0.38**	**1.9**	**39**	<0.54	<0.18	<0.52	**49**	**280**
DG-AQ6	2	11-11.5	DG-AQ6S-11-11.5	12/21/2018	**2.9**	**19**	**63**	**1.0**	**0.65**	**27**	**12**	**32**	**65**	**0.059**	**0.74 J**	**29**	<0.44	<0.15	<0.43	**35**	**170**
DG-AQ6	2	3.5-4	DG-AQ6S-3.5-4	12/21/2018	**1.5**	**14**	**66**	**0.42**	**0.17 J**	**17**	**5.4**	**17**	**25**	**0.042**	**0.33 J**	**20**	<0.45	<0.15	<0.44	**33**	**40**
DG-AQ7	2	0.5-1	DG-AQ7S-0.5-1	1/30/2019	<0.23	**4.5**	**49**	**0.26 J**	**0.057 J**	**13**	**4.6**	**19**	**14**	**0.018**	<0.18	**13**	<0.41	<0.14 U	<0.40	**30**	**30**
DG-AQ7	2	3.5-4	DG-AQ7S-3.5-4	1/30/2019	**9.4**	**21**	**320**	**0.46**	**0.91**	**51**	**10**	**1,300**	**1,400**	**2.0**	**0.47 J**	**85**	<0.50	**1.4**	<0.48	**44**	**660**
DG-AQ8	2	0.5-1	DG-AQ8S-0.5-1	12/21/2018	**11**	**16**	**280**	**0.13 J**	**8.6**	**96**	**15**	**450**	**870**	**0.95**	**11**	**110**	<0.54	**1.0**	<0.52	**40**	**1,300**
DG-AQ8	2	3.5-4	DG-AQ8S-3.5-4	12/21/2018	**44**	**35**	**1,200**	**0.3**	**6.0**	**49**	**13**	**1,000**	**4,500**	**0.9**	**1.5**	**61**	<0.90	**8.4**	**1.8 J**	**29**	**2,400**
DG-AQ8	2	8-8.5	DG-AQ8S-8-8.5	12/21/2018	**2.3**	**16**	**130**	**0.62**	<0.044	**36**	**11**	**75**	**290**	**0.091**	**0.85 J**	**36**	<0.54	**0.31 J**	<0.52	**45**	**200**
DG-AQ9	2	0.5-1	DG-AQ9S-0.5-1	1/30/2019	**3.4**	**7.2**	**72**	<0.13 U	**0.68**	**32**	**10**	**140**	**200**	**0.17**	**1.4 J**	**24**	**3.9 U**	<0.20 U	**1.3 J**	**110**	**410**
DG-AQ9	2	3.5-4	DG-AQ9S-3.5-4	1/30/2019	<0.20 U	<0.20 U	**28**	<0.077 U	**0.14 J**	**9.3**	**11**	**130**	**1.4**	**0.043**	<0.15 U	**5.3**	<0.36 U	<0.12 U	**1.6**	**120**	**36**
DG-AR2	2	0.5-1	DG-AR2S-0.5-1	12/17/2018	<0.33	**5.2**	**80**	<0.13	**0.29 J**	**12**	**12**	**190**	**94**	**0.087**	<0.26	**7.0**	<0.60	**0.33 J**	<0.58	**110**	**120**
DG-AR2	2	3.5-4	DG-AR2S-3.5-4	12/17/2018	**1.2**	**180**	**88**	**0.23**	**0.54**	**17**	**8.1**	**150**	**170**	**0.43**	**0.21 J**	**16**	<0.34	**0.46 J**	<0.33	**50**	**130**
DG-AR3	2	0.5-1	DG-AR3S-0.5-1	12/14/2018	**1.4 U**	**7.4**	**49**	<0.089	<0.034	**13**	**12**	**170**	**23**	**0.077**	<0.18	**6**	<0.41	**0.68 U**	<0.40	**110**	**57**
DG-AR3	2	3.5-4	DG-AR3S-3.5-4	12/14/2018	**1.2**	**41**	**27**	<0.067	**0.13 J**	**12**	**9.6**	**130**	**36**	**0.073**	**0.56 J**	**6.4**	<0.31	**0.52 U**	<0.30	**76**	**53**
DG-AR4	2	0.5-1	DG-AR4S-0.5-1	12/17/2018	<0.17	**0.70 J**	**37**	<0.066	<0.025	**5.4**	**8.9**	**120**	**2.2**	**0.035**	<0.13	**2.3**	<0.30	<0.10	<0.29	**71**	**33**
DG-AR4	2	3.5-4	DG-AR4S-3.5-4	12/17/2018	**1.7**	**120**	**91**	**0.21 J**	**1.0**	**44**	**9.9**	**50**	**140**	**0.57**	<0.16	**32**	<0.38	**0.57 J**	<0.36	**39**	**310**
DG-AR5	2	0.5-1	DG-AR5S-0.5-1	12/20/2018	<0.27	<0.27	**39**	<0.10	<0.040	**9.9**	**11**	**160**	**7.6**	**0.067**	<0.21	**4.4**	<0.48	<0.16	<0.47	**90**	**39**
DG-AR5	2	3.5-4	DG-AR5S-3.5-4	12/20/2018	**0.69 J**	**18**	**180**	**0.48**	**0.33 J**	**89**	**16**	**39**	**70**	**0.088**	**0.49 J**	**140**	<0.43	<0.15	<0.42	**45**	**75**
DG-AR6	2	0.5-1	DG-AR6S-0.5-1	12/21/2018	**4.4**	**11**	**260**	**0.44**	**3.0**	**47**	**8.6**	**220**	**570**	**0.26**	**5.0**	**48**	**0.44 J**	**0.33 J**	<0.40	**31**	**530**
DG-AR6	2	3.5-4	DG-AR6S-3.5-4	12/21/2018	**1.8 U**	**13**	**34**	**0.13 J**	**0.23 J**	**26**	**3.5**	**26**	**75**	**0.015**	**0.29 J**	**29**	<0.55	<0.19	<0.53	**12**	**44**
DG-AR7	2	0.5-1	DG-AR7S-0.5-1	12/19/2018	**5.4**	**16**	**150**	**0.21 J**	**3.4**	**74**	**11**	**260**	**2,700**	**0.7**	**16**	**77**	**1.7 J**	**3.0**	<0.43	**35**	**580**
DG-AR7	2	3.5-4	DG-AR7S-3.5-4	12/19/2018	**0.77 J**	**2.4 J**	**45**	**0.19 J**	**0.056 J**	**12**	**4.5**	**9.8**	**8.9**	**0.022**	<0.20	**17**	<0.47	<0.16	<0.45	**19**	**26**
DG-AR8	2	0.5-1	DG-AR8S-0.5-1	12/21/2018	**3.6**	**9.5**	**220**	**0.12 J**	**3.1**	**49**	**9.9**	**240**	**450**	**0.31**	**3.4**	**56**	**0.82 J**	**0.66**	<0.31	**38**	**1,600**
DG-AR8	2	3.5-4	DG-AR8S-3.5-4	12/21/2018	**23**	**31**	**430**	**0.22 J**	**0.58**	**19**	**7.3**	**180**	**1,600**	**0.078**	**1.6**	**25**	**0.51 J**	**1.3**	**0.34 J**	**34**	**540**
DG-AR9	2	0.5-1	DG-AR9S-0.5-1	1/9/2019	**6.9**	**14**	**200**	**0.22**	**2.8**	**53**	**13**	**270**	**450**	**0.46**	**5.1**	**51**	**2.0**	**0.69**	<0.40	**66**	**670**
DG-AR9	2	3.5-4	DG-AR9S-3.5-4	1/9/2019	**3.5**	**27**	**230**	**0.19**	**0.54**	**30**	**3.7**	**180**	**1,200**	**0.073**	**0.55**	**26**	**1.0**	**1.5**	<0.34	**14**	**390**
DG-AR9 (D)	2	3.5-4	DG-AR9 (D)S-3.5-4	1/9/2019	**5.3**	**49**	**330**	**0.23**	**0.6**	**39**	**4.7**	**180**	**800**	**0.066**	**0.7**	**39**	<0.34	**1.5**	<0.33	**17**	**530**
DG-AS2	2	0.5-1	DG-AS2S-0.5-1	12/17/2018	<0.27	**9.2**	**43**	<0.10	<0.040	**7.0**	**9.9**	**130**	**14**	**0.042**	<0.20	**3.4**	<0.48	<0.16	<0.46	**110**	**42**

Table 2: Metals Concentrations in Soil
Brisbane Baylands OU-2
Brisbane, California

Sample Location	Investigation Zone	Depth Range (ft bgs)	Sample Name	Collection Date	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
Direct Exposure Human Health Risk Level Residential Soil Exposure ESL [1]					1.1E+01	6.7E-02	1.5E+04	1.6E+01	7.8E+01	1.2E+05	2.3E+01	3.1E+03	8.0E+01	1.3E+01	3.9E+02	8.2E+02	3.9E+02	3.9E+02	7.8E-01	3.9E+02	2.3E+04
Regional Background [2]					5.5E+00	1.9E+01	3.2E+02	1.0E+00	2.7E+00	1.0E+02	2.5E+01	6.9E+01	1.6E+01	4.0E-01	7.4E+00	1.2E+02	5.6E+00	1.8E+00	7.6E+00	7.4E+01	1.1E+02
Units					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
DG-AS2	2	3.5-4	DG-AS2S-3.5-4	12/17/2018	**0.39 J**	**2.2**	**20**	<0.072	<0.028	**6.2**	**9.3**	**84**	**2.2**	**0.068**	**0.17 J**	**3.4**	<0.33	<0.11	<0.32	**66**	**32**
DG-AS3	2	0.5-1	DG-AS3S-0.5-1	12/20/2018	**0.49 J**	**0.91 J**	**57**	**0.14 J**	**0.087 J**	**9.1**	**7.6**	**110**	**36**	**0.081**	<0.19 UJ	**5.2 J**	<0.43 UJ	<0.15	<0.42	**73**	**70**
DG-AS3	2	3.5-4	DG-AS3S-3.5-4	12/20/2018	**5.9**	**190**	**69**	**0.23**	**1.1**	**21**	**8.4**	**130**	**120**	**0.2**	**0.19 J**	**23**	<0.31	**0.27 J**	<0.30	**47**	**130**
DG-AS3	2	4.5-5	DG-AS3S-4.5-5	12/20/2018	**2.2**	**21**	**58**	**0.89**	<0.047	**39**	**11**	**37**	**10**	**0.088**	<0.24	**35**	<0.57	<0.19	<0.55	**47**	**74**
DG-AS3 (D)	2	0.5-1	DG-AS3 (D)S-0.5-1	12/20/2018	**1.2 J**	**2.1 J**	**47**	**0.11 J**	**0.31 J**	**14**	**9.2**	**110**	**59**	**0.11**	**0.19 J**	**11 J**	**0.70 J**	<0.13	<0.37	**72**	**91**
DG-AS4	2	0.5-1	DG-AS4S-0.5-1	12/17/2018	**0.27 J**	**0.64 J**	**36**	<0.074	<0.028	**4.3**	**8.8 J**	**76**	**2.3**	**0.043**	<0.15	**2.1**	<0.34	<0.12	<0.33	**68**	**35**
DG-AS4	2	3.5-4	DG-AS4S-3.5-4	12/17/2018	**2.8**	**230**	**150**	**0.23 J**	**0.87**	**43**	**11**	**110**	**330**	**0.56**	**0.28 J**	**31**	<0.46	**0.45 J**	<0.44	**45**	**460**
DG-AS4 (D)	2	0.5-1	DG-AS4 (D)S-0.5-1	12/17/2018	<0.19 UJ	**0.43 J**	**25**	<0.075	<0.029	**4.0**	**5.0 J**	**72**	**2.5**	**0.051**	<0.15	**2.2**	<0.34	<0.12	<0.33	**46**	**34**
DG-AS5	2	0.5-1	DG-AS5S-0.5-1	12/17/2018	**0.72 J**	**3.7 U**	**29**	<0.12	**0.098 J**	**10**	**8.7**	**86**	**7.2**	**0.067**	**0.36 J**	**7.2**	<0.56	<0.19	<0.54	**76**	**30**
DG-AS5	2	3.5-4	DG-AS5S-3.5-4	12/17/2018	<0.20	**2.4 U**	**120**	<0.077	**0.066 J**	**30**	**3.4**	**10**	**48**	**0.075**	<0.15	**36**	<0.36	**0.17 J**	**0.51 J**	**17**	**41**
DG-AS6	2	0.5-1	DG-AS6S-0.5-1	12/21/2018	**5.3 J**	**17**	**150 J**	**0.45**	**1.9 J**	**47**	**9.6**	**160 J**	**360 J**	**0.45 J**	**3.2**	**56**	**0.87 J**	<0.14 UJ	<0.41	**36**	**330 J**
DG-AS6	2	3.5-4	DG-AS6S-3.5-4	12/21/2018	**1.5 U**	**17**	**89**	**0.12 J**	**0.19 J**	**8.0**	**4.4**	**16**	**35**	**0.023**	**0.23 J**	**7.6**	<0.45	<0.15	<0.44	**23**	**60**
DG-AS7	2	0.5-1	DG-AS7S-0.5-1	1/9/2019	**9.6**	**15**	**170**	**0.19**	**3.8**	**77**	**15**	**310**	**940**	**0.88**	**7.1**	**150**	**3.6**	**0.52**	<0.56	**73**	**970**
DG-AS7	2	3.5-4	DG-AS7S-3.5-4	1/9/2019	**0.75**	**3.5**	**75**	**0.25**	**0.035**	**12**	**6.2**	**15**	**7.6**	**0.036**	**0.36**	**13**	<0.30	<0.10	<0.29	**40**	**31**
DG-AS8	2	0.5-1	DG-AS8S-0.5-1	12/21/2018	**6.8 J**	**130 J**	**190 J**	**0.42 J**	**0.50 J**	**43 J**	**12 J**	**230 J**	**450 J**	**0.97**	**0.89 J**	**71 J**	<0.53 UJ	**0.73 J**	<0.51	**51 J**	**340 J**
DG-AS8	2	3.5-4	DG-AS8S-3.5-4	12/21/2018	**1.1 J**	**110**	**77**	**0.41**	<0.042	**52**	**14**	**13**	**17**	**0.043**	<0.22	**41**	<0.51	<0.17	<0.50	**52**	**40**
DG-AS8 (D)	2	0.5-1	DG-AS8 (D)S-0.5-1	12/21/2018	**10**	**200**	**290**	**0.25 J**	**1.1 J**	**47**	**14**	**300**	**610**	**1.4**	**1.3 J**	**87**	**0.43 J**	**0.70 J**	<0.36	**58**	**510**
DG-AT2	2	0.5-1	DG-AT2S-0.5-1	12/17/2018	**0.59 J**	**1.9 J**	**29**	<0.12	<0.045	**9.0**	**10**	**130**	**15**	**0.16**	<0.23	**3.8**	<0.54	<0.18	<0.52	**110**	**46**
DG-AT2	2	3.5-4	DG-AT2S-3.5-4	12/17/2018	**0.55 J**	**1.2 J**	**26**	<0.094	<0.036	**8.0**	**12**	**100**	**7.7**	**0.12**	**0.29 J**	**3.9**	**0.69 J**	<0.15	<0.42	**89**	**42**
DG-AT2 (D)	2	0.5-1	DG-AT2 (D)S-0.5-1	12/17/2018	<0.30	<0.31 UJ	**25 J**	<0.12	<0.046 UJ	**8.1**	**9.4**	**100**	**6.4**	**0.12 J**	<0.23	**3.2**	<0.55 UJ	<0.19	<0.53	**100**	**36 J**
DG-AT3	2	0.5-1	DG-AT3S-0.5-1	12/14/2018	**1.6 U**	**3.3**	**37**	<0.11	<0.041	**11**	**9.4**	**120**	**18**	**0.12**	**0.48 J**	**5.8**	<0.49	**0.82 U**	<0.48	**94**	**49**
DG-AT3	2	3.5-4	DG-AT3S-3.5-4	12/14/2018	**2.9**	**440**	**63**	<0.11	**0.75**	**18**	**10**	**140**	**130**	**0.14**	<0.22	**14**	**0.52 J**	**0.85 U**	<0.50	**73**	**180**
DG-AT4	2	0.5-1	DG-AT4S-0.5-1	12/17/2018	<0.26	**0.76 J**	**50 J**	<0.10	**0.11 J**	**5.6**	**13**	**110**	**9.0**	**0.042 J**	<0.20	**3.4**	**0.61 J**	<0.16	<0.46	**87**	**350 J**
DG-AT4	2	3.5-4	DG-AT4S-3.5-4	12/17/2018	**1.2 J**	**150**	**180**	**0.18 J**	**0.87**	**30**	**6.7**	**71**	**310**	**0.68**	**0.30 J**	**24**	<0.39	**0.38 J**	<0.38	**34**	**370**
DG-AT5	2	0.5-1	DG-AT5S-0.5-1	12/20/2018	**0.68 J**	**0.21 J**	**28**	<0.078	<0.030	**10**	**12**	**200**	**2.0**	**0.029**	<0.15	**4.5**	<0.36	<0.12	<0.35 UJ	**95**	**36**
DG-AT5	2	3.5-4	DG-AT5S-3.5-4	12/20/2018	**8.3**	**83**	**180**	**0.25**	**0.86**	**20**	**8.8**	**140**	**600**	**0.16**	**0.49 J**	**19**	<0.37	**0.98**	<0.35	**53**	**350**
DG-AT6	2	0.5-1	DG-AT6S-0.5-1	12/21/2018	**8.1**	**12**	**190**	<0.18	**4.6**	**86**	**15**	**530**	**860**	**0.6**	**9.7**	**78**	<0.82	**0.60 J**	<0.79	**50**	**900**
DG-AT6	2	3.5-4	DG-AT6S-3.5-4	12/21/2018	**1.4 U**	**6.0**	**73**	**0.57**	**0.16 J**	**13**	**6.8**	**16**	**12**	**0.017**	**0.49 J**	**16**	<0.41	<0.14	<0.40	**51**	**38**
DG-AT7	2	3.5-4	DG-AT7S-3.5-4	12/19/2018	**1.1 J**	**86**	**70**	**0.17 J**	**0.070 J**	**15**	**9.6**	**66**	**21**	**0.052**	<0.19	**17**	<0.44	<0.15	<0.43	**59**	**54**
DG-AU2	2	0.5-1	DG-AU2S-0.5-1	12/17/2018	**0.51 J**	<0.30	**27**	<0.12	<0.044	**8.2**	**15**	**120**	**3.0**	**0.046**	<0.23	**3.6**	**0.65 J**	<0.18	<0.52	**130**	**47**
DG-AU2	2	3.5-4	DG-AU2S-3.5-4	12/17/2018	**1.2**	**1.0 J**	**46**	<0.074	**0.046 J**	**12**	**14**	**130**	**2.5**	**0.059**	**0.41 J**	**5**	<0.34	**0.22 J**	<0.33	**120**	**48**
DG-AU3	2	0.5-1	DG-AU3S-0.5-1	12/20/2018	**0.99 J**	**9.4**	**64**	**0.11 J**	**0.28 J**	**15**	**10**	**120**	**66**	**0.11**	**0.20 J**	**10**	<0.41	**0.18 J**	<0.40	**92**	**96**
DG-AU3	2	3.5-4	DG-AU3S-3.5-4	12/20/2018	**0.79 J**	**79**	**290**	**0.48**	**0.15 J**	**19**	**6.4**	**43**	**61**	**0.42**	**0.26 J**	**22**	<0.33	**0.11 J**	<0.32	**28**	**180**
DG-AU4	2	0.5-1	DG-AU4S-0.5-1	12/17/2018	**0.92 J**	<0.31	**40**	<0.12	<0.046	**4.4**	**11**	**82**	**0.39 J**	**0.029**	<0.24	**2.5**	<0.56	<0.19	<0.54	**91**	**39**
DG-AU4	2	3.5-4	DG-AU4S-3.5-4	12/17/2018	**0.95 J**	**46**	**150**	**0.2**	**0.13 J**	**49**	**9.3**	**13**	**260**	**0.15**	**0.35 J**	**28**	<0.30	**0.16 J**	<0.29	**39**	**76**
DG-AU5	2	0.5-1	DG-AU5S-0.5-1	12/17/2018	<0.31	<0.32	**250**	**0.29 J**	**7.0**	**4100**	**36**	**830**	**950**	**1.3**	**80**	**2900**	**2.3 J**	**1.1**	**2.7**	**47**	**1,300**
DG-AU5	2	3.5-4	DG-AU5S-3.5-4	12/17/2018	**4.2**	**120**	**31**	<0.068	**0.31**	**9.3**	**3.2**	**52**	**160**	**0.069**	**0.35 J**	**11**	<0.32	<0.11	<0.31	**18**	**57**
DG-AU6	2	0.5-1	DG-AU6S-0.5-1	12/21/2018	**6.8**	**15**	**200**	<0.18	**5.4**	**84**	**13**	**510**	**600**	**0.57**	**9.3**	**80**	<0.85	**0.81 J**	<0.82	**32**	**750**
DG-AU6	2	3.5-4	DG-AU6S-3.5-4	12/21/2018	**9.7**	**110**	**79**	**0.74**	**0.5**	**18**	**8.8**	**140**	**320**	**0.55**	**1.3**	**27**	**1.1 J**	<0.11	<0.32	**57**	**110**
DG-AU7	2	0.5-1	DG-AU7S-0.5-1	1/9/2019	**2.3**	**6.2**	**110**	**0.14**	**1.5**	**24**	**10**	**130**	**220**	**0.14**	**1.6**	**24**	**1.3**	**0.17**	<0.47	**63**	**300**
DG-AU7	2	3.5-4	DG-AU7S-3.5-4	1/9/2019	**91**	**43**	**1,200**	<2.9	**6.2**	**46**	**13**	**1,500**	**6,700**	**0.74**	**6.3**	**110**	**18**	**6.5**	<13	**26**	**3,700**
DG-AU7 (D)	2	0.5-1	DG-AU7 (D)S-0.5-1	1/9/2019	**5.0**	**8.5**	**120**	**0.17**	**1.7**	**28**	**9.9**	**180**	**310**	**0.19**	**2.6**	**44**	**2.3**	<0.19	<0.54	**61**	**340**
DG-AV2	2	0.5-1	DG-AV2S-0.5-1	2/1/2019	**2.4**	**16**	**56**	**0.23 J**	**0.93**	**18**	**11**	**150**	**180**	**0.14**	**0.71 J**	**19**	**1.2 J**	**0.34 J**	<0.46 R	**89**	**230**
DG-AV2	2	3.5-4	DG-AV2S-3.5-4	2/1/2019	**1.9**	**8.2**	**320**	**0.73**	**0.25 J**	**49**	**14**	**58**	**360**	**0.071**	<0.20	**56**	**0.85 J**	<0.15	<0.44 R	**48**	**100**
DG-AV3	2	0.5-1	DG-AV3S-0.5-1	2/1/2019	**4.2**	**690**	**130**	<0.096	**0.69**	**12**	**10**	**300**	**230**	**0.13**	<0.19	**12**	**0.54 J**	**0.45 J**	<0.43 R	**77**	**150**
DG-AV3	2	3.5-4	DG-AV3S-3.5-4	2/1/2019	**0.36 J**	**7.1**	**27**	<0.090	**0.20 J**	**9.6**	**8.9**	**110**	**41**	**0.13**	<0.18	**7.6**	<0.42	**0.17 J**	<0.40 R	**63**	**59**
DG-AV4	2	0.5-1	DG-AV4S-0.5-1	12/17/2018	**0.73 J**	<0.33	**16**	<0.13	<0.048	**16 J**	**16**	**130 J**	**1.5 J**	**0.031**	<0.25	**6.1**	<0.58	<0.20	<0.56	**120**	**48**
DG-AV4	2	3.5-4	DG-AV4S-3.5-4	12/17/2018	**1.2 J**	**9.9**	**160**	**0.5**	**0.061 J**	**31**	**17**	**39**	**23**	**0.077**	**0.28 J**	**46**	<0.54	**0.18 J**	<0.52	**29**	**79**
DG-AV4	2	8-8.5	DG-AV4S-8-8.5	12/17/2018	**1.5 J**	**13**	**39**	**0.44**	**0.081 J**	**26**	**13**	**20**	**7.1**	**0.034**	**0.59 J**	**27**	<0.51	<0.17	<0.50	**35**	**54**
DG-AV4 (D)	2	3.5-4	DG-AV4 (D)S-3.5-4	12/17/2018	**0.94 J**	**16**	**140**	**0.55**	<0.026 UJ	**25**	**12**	**43**	**17**	**0.048**	**0.37 J**	**40**	<0.31	<0.11 UJ	<0.30	**25**	**81**
DG-AV5	2	0.5-1	DG-AV5S-0.5-1	12/20/2018	**5.0**	**12**	**240**	**0.45 J**	**1.6 J**	**51 J**	**9.4**	**300**	**290**	**1.3**	**3.5 J**	**48 J**	**0.70 J**	**7.7 J**	<0.49	**38**	**550**
DG-AV5	2	3.5-4	DG-AV5S-3.5-4	12/20/2018	**13 J**	**1,400 J**	**33 J**	**0.33 J**	**0.77**	**24 J**	**3.3 J**	**8.3 J**	**28 J**	**0.023**	<0.21	**19 J**	**0.52 J**	<0.17 U	**32 J**	**15 J**	**40 J**
DG-AV5	2	7.5-8	DG-AV5S-7.5-8	12/20/2018	**2.3**	**110**	**55**	**1.0**	<0.035	**38**	**19**	**45**	**13**	**0.039**	**0.24 J**	**36**	<0.42	<0.14	<0.41	**48**	**82**

Table 2: Metals Concentrations in Soil
Brisbane Baylands OU-2
Brisbane, California

Sample Location	Investigation Zone	Depth Range (ft bgs)	Sample Name	Collection Date	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
Direct Exposure Human Health Risk Level Residential Soil Exposure ESL [1]					1.1E+01	6.7E-02	1.5E+04	1.6E+01	7.8E+01	1.2E+05	2.3E+01	3.1E+03	8.0E+01	1.3E+01	3.9E+02	8.2E+02	3.9E+02	3.9E+02	7.8E-01	3.9E+02	2.3E+04
Regional Background [2]					5.5E+00	1.9E+01	3.2E+02	1.0E+00	2.7E+00	1.0E+02	2.5E+01	6.9E+01	1.6E+01	4.0E-01	7.4E+00	1.2E+02	5.6E+00	1.8E+00	7.6E+00	7.4E+01	1.1E+02
Units					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
DG-AV5 (D)	2	0.5-1	DG-AV5 (D)S-0.5-1	12/20/2018	**5.8**	**15**	**190**	**0.15 J**	**3.0 J**	**100 J**	**13**	**480**	**420**	**1.0**	**12 J**	**93 J**	**0.84 J**	**1.2 J**	<0.35	**36**	**720**
DG-AV6	2	0.5-1	DG-AV6S-0.5-1	12/21/2018	**5.9 J**	**12 J**	**300 J**	**0.39 J+**	**2.3 J**	**47 J**	**16 J**	**190 J**	**290 J**	**0.36**	**4.3**	**55 J**	**1.1 J**	**0.30 J**	<0.45 U	**40 J**	**360 J**
DG-AV6	2	3.5-4	DG-AV6S-3.5-4	12/21/2018	**51**	**32**	**1,600**	**0.94**	**6.3**	**56**	**13**	**1,200**	**5,400**	**1.0**	**4.2**	**50**	**3.4 J**	**9.1**	<0.86	**27**	**4,200**
DG-AV6	2	7-7.5	DG-AV6S-7-7.5	12/21/2018	**3.2**	**23**	**100**	**1.1**	**0.67**	**38**	**16**	**89**	**120**	**0.046**	**1.2 J**	**44**	**0.58 J**	<0.17	<0.48	**53**	**310**
DG-AV6 (D)	2	3.5-4	DG-AV6 (D)S-3.5-4	12/21/2018	**190 J**	**34 J**	**1,800 J**	**1.0**	**6.0 J**	**71**	**11**	**1,300 J**	**10,000 J**	**1.0 J**	**3.1 J**	**60**	**3.9 J**	**7.6 J**	<1.0	**46**	**3,900 J**
DG-AW2	2	0.5-1	DG-AW2S-0.5-1	1/31/2019	**0.28 J**	**28**	**33**	<0.088 U	**0.30 J**	**13**	**9.7**	**110**	**83**	**0.1**	**0.21 J**	**10**	<0.41 U	**0.31 J**	**0.85 J**	**87**	**86**
DG-AW2	2	3.5-4	DG-AW2S-3.5-4	1/31/2019	**3.1 J**	**370**	**140**	**0.19 J**	**0.36 J**	**44**	**12**	**97 J**	**450 J**	**0.13 J**	**0.39 J**	**38**	**1.2 J**	**0.32 J**	**0.84 J**	**64**	**330 J**
DG-AW2 (D)	2	3.5-4	DG-AW2 (D)S-3.5-4	1/31/2019	**7.2 J**	**440**	**130**	<0.11 UJ	**1.6 J**	**35**	**18**	**450 J**	**820 J**	**0.073 J**	**0.36 J**	**40**	**2.1 J**	**1.0 J**	**1.3 J**	**98**	**630 J**
DG-AW3	2	0.5-1	DG-AW3S-0.5-1	1/31/2019	**3.4**	**55**	**120**	**0.12 J**	**1.2**	**38**	**13**	**160**	**230**	**0.23**	**3.2**	**35**	**1.8 J**	<0.17	<0.49	**74**	**330**
DG-AW3	2	3.5-4	DG-AW3S-3.5-4	1/31/2019	**2.6**	**120**	**130**	**0.15 J**	**0.6**	**21**	**9.6**	**130**	**150**	**0.19**	**0.29 J**	**18**	**1.2 J**	**0.13 J**	<0.38	**77**	**260**
DG-AW4	2	0.5-1	DG-AW4S-0.5-1	2/1/2019	**4.0**	**51**	**96**	<0.12	**2.6**	**35**	**11**	**200**	**370**	**0.42**	**2.9**	**37**	**1.5 J**	**0.97**	**0.86**	**60**	**590**
DG-AW4	2	3.5-4	DG-AW4S-3.5-4	2/1/2019	**1.2 U**	**62**	**53**	<0.079	**0.41**	**13**	**8.5**	**58**	**16**	**0.099**	<0.16	**16**	<0.36	<0.12	**0.36**	**56**	**91**
DG-AW5	2	0.5-1	DG-AW5S-0.5-1	12/14/2018	**27**	**34**	**1,400**	**0.56**	**3.7**	**44**	**10**	**790**	**4,800**	**--**	**0.71 J**	**62**	<1.3	**8.1**	**2.0 J**	**32**	**2,800**
DG-AW5	2	3.5-4	DG-AW5S-3.5-4	12/14/2018	**2.6**	**7.4**	**150**	<0.10	**1.2**	**29**	**7.1**	**140**	**270**	**0.37**	**1.6**	**37**	<0.47	**0.78**	<0.45	**35**	**310**
DG-AX2	2	0.5-1	DG-AX2S-0.5-1	2/1/2019	**4.3**	**67**	**170**	**0.31 J**	**2.7**	**160**	**14**	**190**	**470**	**0.92**	**4.3**	**120**	**1.2 J**	**0.39 J**	<0.51 R	**62**	**440**
DG-AX2	2	3.5-4	DG-AX2S-3.5-4	2/1/2019	**4.2**	**96**	**88**	**0.54**	**1.1**	**110**	**18**	**120**	**160**	**0.41**	**0.85 J**	**150**	<0.57	**0.22 J**	<0.55 R	**65**	**200**
DG-AX3	2	0.5-1	DG-AX3S-0.5-1	2/1/2019	**35**	**350**	**250**	**0.32 J**	**2.8**	**43**	**12**	**640**	**3,100**	**0.18**	<0.22	**59**	**2.1 J**	**6.1**	<0.50 R	**43**	**1,000**
DG-AX3	2	3.5-4	DG-AX3S-3.5-4	2/1/2019	**0.97 J**	**60**	**67**	**0.31 J**	**0.26 J**	**97**	**18**	**33**	**10**	**2.2**	<0.22	**140**	**0.73 J**	<0.18	<0.51 R	**67**	**56**
DG-AX4	2	0.5-1	DG-AX4S-0.5-1	2/1/2019	**4.7**	**240**	**110**	<0.12	**0.75**	**28**	**12**	**110**	**160**	**0.16**	**0.39 J**	**30**	**1.5 J**	<0.19	<0.54	**62**	**200**
DG-AX4	2	3.5-4	DG-AX4S-3.5-4	2/1/2019	**4.6**	**420**	**81**	**0.29**	**0.14 J**	**47**	**14**	**18**	**5.3**	**0.032**	**0.20 J**	**35**	**0.90 J**	<0.15	<0.43	**50**	**35**
DG-AX5	2	0.5-1	DG-AX5S-0.5-1	12/20/2018	**2.4**	**9.6**	**200**	**0.57**	**0.34 J**	**44**	**12**	**69**	**220**	**0.13**	**0.24 J**	**42**	**0.56 J**	<0.17	<0.49	**43**	**230**
DG-AX5	2	3.5-4	DG-AX5S-3.5-4	12/20/2018	**2.3**	**14**	**64**	**0.9**	<0.038	**39**	**17**	**49**	**12**	**0.096**	<0.20	**38**	<0.47	<0.16	<0.45	**45**	**83**
DG-AY2	2	0.5-1	DG-AY2S-0.5-1	2/1/2019	**5.4**	**330**	**58**	**0.17 J**	**1.5**	**26**	**13**	**150**	**340**	**0.26**	**0.25 J**	**48**	**1.7 J**	**0.26 J**	<0.52 R	**48**	**190**
DG-AY2	2	3.5-4	DG-AY2S-3.5-4	2/1/2019	**0.89 J**	**11**	**99**	**0.53**	**0.19 J**	**93**	**17**	**27**	**7.1**	**0.69**	<0.19	**150**	**1.5 J**	<0.15	<0.44 R	**66**	**51**
DG-AY3	2	0.5-1	DG-AY3S-0.5-1	1/31/2019	**0.44 J**	**8.8**	**37**	**0.11 J**	**0.24 J**	**13**	**11**	**120**	**22**	**0.081**	<0.16	**6.5**	<0.38	<0.13	<0.36	**110**	**54**
DG-AY3	2	3.5-4	DG-AY3S-3.5-4	1/31/2019	**2.6**	**150**	**61**	**0.18 J**	**0.49**	**23**	**9.7**	**89**	**62**	**0.27**	<0.17	**22**	**1.3 J**	<0.13	<0.38	**52**	**100**
DG-AY4	2	0.5-1	DG-AY4S-0.5-1	2/1/2019	**11 J**	**13**	**130**	<0.096	**3.1**	**47**	**11**	**170**	**1,100**	**0.091 J**	**3.8**	**82**	**2.5 J**	**0.37 J**	<0.43	**35**	**520**
DG-AY4	2	3.5-4	DG-AY4S-3.5-4	2/1/2019	**4.3 J-**	**7.6**	**96 J-**	**0.34 J**	**0.15 J**	**56 J**	**15 J**	**37 J-**	**22 J**	**0.45**	<0.24	**71 J**	**1.5 J**	<0.19	<0.54	**53 J**	**87 J-**
DG-AY4 (D)	2	0.5-1	DG-AY4 (D)S-0.5-1	2/1/2019	**22 J**	**18**	**190**	<0.080	**3.6**	**56**	**10**	**190**	**1,100**	**0.65 J**	**3.7**	**63**	**2.5 J**	**0.52 J**	**0.52**	**36**	**710**
DG-AZ2	2	0.5-1	DG-AZ2S-0.5-1	2/1/2019	**4.0**	**210**	**77**	<0.63	**0.77**	**12**	**5.7**	**610**	**250**	**0.23**	**0.35 J**	**17**	<0.58	<0.97	<0.56 R	**39**	**110**
DG-AZ2	2	3.5-4	DG-AZ2S-3.5-4	2/1/2019	**2.1**	**130**	**62**	**0.38**	**0.23 J**	**80**	**17**	**55**	**56**	**4.3**	<0.22	**95**	**0.73 J**	<0.18	<0.50 R	**64**	**82**
DG-AZ3	2	0.5-1	DG-AZ3S-0.5-1	2/1/2019	**2.6**	**120**	**34**	<0.10	**0.17 J**	**8.3**	**9.4**	**89**	**64**	**0.071**	<0.20	**9.1**	**0.64 J**	<0.16	<0.46	**59**	**64**
DG-AZ3	2	3.5-4	DG-AZ3S-3.5-4	2/1/2019	**3.5**	**88**	**47**	**0.43**	**1.0**	**43**	**17**	**20**	**29**	**0.016**	<0.24	**34**	**4.9**	<0.19	**1.4**	**68**	**1,100**
DG-N10	3	0.5-1	DG-N10S-0.5-1	1/14/2019	**17**	**18**	**120**	**0.99**	**1.0**	**27**	**11**	**3,600**	**1,700**	**2.0**	**2.4**	**59**	**3.1 J**	**0.37 J**	<0.46	**56**	**390**
DG-N10	3	3.5-4	DG-N10S-3.5-4	1/14/2019	**6.0**	**4.8**	**43**	**0.23**	**0.21 J**	**11**	**3.1**	**66**	**240**	**0.081**	**0.63 J**	**12**	**0.43 J**	<0.11	**0.44 J**	**14**	**64**
DG-N11	3	0.5-1	DG-N11S-0.5-1	12/20/2018	**39**	**30**	**200**	<0.31	**2.1**	**36**	**12**	**1,700**	**2,900**	**0.13**	<0.61	**36**	<1.4	**1.3 J**	<1.4	**25**	**1,200**
DG-N11	3	3.5-4	DG-N11S-3.5-4	12/20/2018	**24**	**31**	**340**	<0.20	**0.79**	**42**	**10**	**230**	**6,600**	**0.18**	**0.90 J**	**24**	**1.4 J**	**0.35 J**	<0.87	**20**	**900**
DG-N12	3	0.5-1	DG-N12S-0.5-1	1/14/2019	**3.4 J-**	**89 J**	**80 J**	**0.25 J+**	**0.43 J+**	**14 J**	**13 J**	**140 J**	**470 J**	**0.11 J+**	**0.48 J**	**12 J**	**1.1 J**	<0.14	**1.1 J**	**79 J**	**250 J**
DG-N12	3	3.5-4	DG-N12S-3.5-4	1/14/2019	**1.3**	**26 J**	**29**	**0.36 J**	<0.030 UJ	**32**	**13**	**92 J**	**16**	**0.1**	**1.6 J**	**24**	<0.36 UJ	<0.12	**0.80 J**	**77**	**64**
DG-N12 (D)	3	3.5-4	DG-N12 (D)S-3.5-4	1/14/2019	**1.8 J**	**13 J**	**25 J**	**0.68 J**	**0.13 J**	**37 J**	**15 J**	**53 J**	**22 J**	**0.087**	**2.7 J**	**28 J**	**0.77 J**	<0.15	<0.43 UJ	**57 J**	**66 J+**
DG-N13	3	0.5-1	DG-N13S-0.5-1	1/10/2019	**1.2 J**	**3.3 J**	**120**	**0.30 J**	**0.18 J**	**15**	**13**	**93**	**58**	**0.079**	**0.53 J**	**15 J**	**1.3 J**	<0.17	<0.49	**97**	**90**
DG-N13	3	3.5-4	DG-N13S-3.5-4	1/10/2019	**0.59 J**	**2.8 J**	**50 J**	**0.23 J**	<0.044	**130 J**	**25 J**	**35 J+**	**7.9**	**0.16**	**0.79 J**	**120 J**	**1.4 J**	<0.18	<0.51	**74 J**	**57 J**
DG-N13	3	7.5-8	DG-N13S-7.5-8	1/10/2019	<0.22	**3.8**	**29**	**0.3**	<0.032	**50**	**8.1**	**5.2**	**2.3**	<0.0024	**0.39 J**	**21**	<0.39	<0.13	<0.38	**36**	**14**
DG-N13 (D)	3	0.5-1	DG-N13 (D)S-0.5-1	1/10/2019	**1.7 J**	**6.7 J**	**150**	**0.55 J**	**0.40 J**	**21**	**14**	**79**	**95**	**0.076**	**0.75 J**	**27 J**	**2.7 J**	<0.19	<0.56	**73**	**140**
DG-N14	3	0.5-1	DG-N14S-0.5-1	1/14/2019	**6.8**	**95**	**120**	**0.22 J**	**1.4**	**37**	**17**	**250**	**510**	**0.26**	**1.7**	**31**	**1.2 J**	<0.16	**1.7**	**110**	**350**
DG-N14	3	3.5-4	DG-N14S-3.5-4	1/14/2019	**1.5**	**15**	**160**	**0.66**	<0.034	**58**	**14**	**31**	**7.9**	**0.12**	<0.18	**73**	<0.42	<0.18	**0.50 J**	**81**	**71**
DG-N15	3	0.5-1	DG-N15S-0.5-1	12/21/2018	**2.9**	**110**	**95**	**0.78**	**0.40 J**	**150**	**21**	**62**	**60**	**22**	**0.79 J**	**180**	<0.50	<0.17	<0.48	**59**	**87**
DG-N15	3	3.5-4	DG-N15S-3.5-4	12/21/2018	**3.5**	**39**	**110**	**0.79**	**0.26 J**	**210**	**28**	**32**	**9.5**	**9.0**	**0.75 J**	**380**	**1.5 J**	<0.11	<0.32	**75**	**56**
DG-N6	3	0.5-1	DG-N6S-0.5-1	12/19/2018	**5.0**	**19**	**79**	**0.13 J**	**6.0**	**55**	**10**	**1,100**	**940**	**0.32**	**8.3**	**47**	**2.2 J**	**1.0**	<0.52	**43**	**750**
DG-N6	3	3.5-4	DG-N6S-3.5-4	12/19/2018	**8.9**	**9.0**	**320**	**0.21 J**	**0.95**	**17**	**3.5**	**300**	**1,600**	**0.55**	**1.6 J**	**13**	**1.8 J**	**2.0**	**1.2 J**	**11**	**770**
DG-N7	3	0.5-1	DG-N7S-0.5-1	12/18/2018	**0.87 J**	**10**	**15**	<0.12	<0.046	**11**	**15**	**96**	**17**	**0.067**	**0.57 J**	**6.1**	<0.56	<0.19	<0.54	**100**	**77**
DG-N7	3	3.5-4	DG-N7S-3.5-4	12/18/2018	**1.1 J**	**100**	**58**	<0.083	**0.58**	**15**	**15**	**120**	**290**	**0.072**	**0.17 J**	**15**	<0.38	**0.17 J**	<0.37	**100**	**200**
DG-N8	3	0.5-1	DG-N8S-0.5-1	1/15/2019	**11**	**140**	**1,400**	**1.4**	**4.3**	**100**	**27**	**610**	**1,300**	**0.42**	**6.0**	**170**	**3.7 J**	**0.77 J**	**0.36 J**	**140**	**1,700**

Table 2: Metals Concentrations in Soil
Brisbane Baylands OU-2
Brisbane, California

Sample Location	Investigation Zone	Depth Range (ft bgs)	Sample Name	Collection Date	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
Direct Exposure Human Health Risk Level Residential Soil Exposure ESL [1]					1.1E+01	6.7E-02	1.5E+04	1.6E+01	7.8E+01	1.2E+05	2.3E+01	3.1E+03	8.0E+01	1.3E+01	3.9E+02	8.2E+02	3.9E+02	3.9E+02	7.8E-01	3.9E+02	2.3E+04
Regional Background [2]					5.5E+00	1.9E+01	3.2E+02	1.0E+00	2.7E+00	1.0E+02	2.5E+01	6.9E+01	1.6E+01	4.0E-01	7.4E+00	1.2E+02	5.6E+00	1.8E+00	7.6E+00	7.4E+01	1.1E+02
Units					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
DG-N8	3	3.5-4	DG-N8S-3.5-4	1/15/2019	**2.5 J**	**11 J**	**100 J**	**1.7 J**	**0.23 J**	**43 J**	**20**	**110**	**35 J**	**0.047**	**1.0 J**	**36 J**	**1.8 J**	<0.12	**0.44 J**	**95**	**72**
DG-N8 (D)	3	3.5-4	DG-N8 (D)S-3.5-4	1/15/2019	**1.3 J**	**4.1 J**	**34 J**	**0.11 J**	<0.029 UJ	**17 J**	**12**	**75**	**16 J**	**0.035**	<0.15 UJ	**15 J**	**0.54 J**	<0.12	<0.34 UJ	**89**	**51**
DG-N9	3	0.5-1	DG-N9S-0.5-1	1/10/2019	**1.5**	**32**	**49**	<0.080	**0.24 J**	**36**	**12**	**110**	**170**	**0.3**	**0.38 J**	**32**	**1.2 J**	<0.12	**1.4**	**75**	**110**
DG-N9	3	3.5-4	DG-N9S-3.5-4	1/10/2019	**1.9**	**140**	**63**	**0.67**	<0.036	**48**	**16**	**54**	**26**	**0.18**	**0.20 J**	**38**	**2.0 J**	<0.15	**0.61 J**	**50**	**110**
DG-O10	3	0.5-1	DG-O10S-0.5-1	1/14/2019	**2,500 J**	**97 J**	**92 J**	**0.45**	**2.0 J**	**25 J**	**7.6 J**	**1,800**	**17,000**	**0.11 J**	**2.2 J**	**35 J**	**1.8 J**	**6.3**	<1.5	**22 J**	**600 J**
DG-O10	3	3.5-4	DG-O10S-3.5-4	1/14/2019	**4.5 J-**	**13 J**	**100 J**	**0.9**	**0.64**	**44**	**15**	**640**	**180**	**0.19**	**0.47 J**	**48 J-**	**2.4 J**	<0.13	<0.39	**49 J-**	**300**
DG-O10 (D)	3	0.5-1	DG-O10 (D)S-0.5-1	1/14/2019	**4,300 J**	**57 J**	**24 J**	**0.5**	**4.8 J**	**50 J**	**13 J**	**1,300**	**14,000**	**0.053 J**	**5.2 J**	**77 J**	**10 J**	**8.2**	<1.7	**12 J**	**2,800 J**
DG-O11	3	0.5-1	DG-O11S-0.5-1	1/10/2019	**1.3**	**9.4**	**39**	**0.34**	<0.031	**32**	**14**	**53**	**68**	**0.049**	**0.21 J**	**46**	**1.0 J**	<0.13	**1.4**	**84**	**71**
DG-O11	3	3.5-4	DG-O11S-3.5-4	1/10/2019	**12**	**59**	**140**	<0.11	**4.3**	**71**	**11**	**680**	**2,000**	**0.39**	**1.1 J**	**61**	**4.0**	**0.17 J**	**1.3 J**	**68**	**570**
DG-O12	3	0.5-1	DG-O12S-0.5-1	1/14/2019	**8.4**	**25**	**100**	**0.24 J**	**1.1**	**36**	**11**	**150**	**730**	**0.24**	**1.1 J**	**46**	**0.73 J**	<0.20	<0.58	**59**	**320**
DG-O12	3	3.5-4	DG-O12S-3.5-4	1/14/2019	**59**	**24**	**240**	**0.49**	**3.8**	**39**	**15**	**6,800**	**3,700**	**0.17**	**2.5**	**45**	**6.6 J**	**1.8 J**	<2.2	**65**	**1,700**
DG-O13	3	0.5-1	DG-O13S-0.5-1	12/21/2018	**880**	**140**	**510**	**0.42 J**	**2.8**	**78**	**26**	**5,900**	**19,000**	**0.11**	**5.1 J**	**270**	<1.6	**4.2**	<1.5	**49**	**990**
DG-O13	3	3.5-4	DG-O13S-3.5-4	12/21/2018	**12**	**15**	**110**	**0.89**	**1.6**	**42**	**11**	**250**	**910**	**0.28**	**2.0**	**37**	<0.56	<0.19	<0.54	**69**	**350**
DG-O14	3	0.5-1	DG-O14S-0.5-1	1/14/2019	**0.35 J**	**2.4**	**54**	<0.079	**0.079 J**	**14**	**14**	**140**	**130**	**0.17**	**0.49 J**	**12**	<0.36	<0.12	**1.2**	**100**	**88**
DG-O14	3	3.5-4	DG-O14S-3.5-4	1/14/2019	**2.1**	**8.5**	**130**	**0.8**	<0.035	**150**	**23**	**56**	**61**	**0.22**	**0.66 J**	**130**	**1.2 J**	<0.14	<0.41	**63**	**140**
DG-O15	3	0.5-1	DG-O15S-0.5-1	1/10/2019	**2.4**	**75**	**170 J-**	**0.37 J+**	**0.044 J**	**210**	**29**	**34 J+**	**11**	**17**	**0.53 J**	**300**	**1.5 J**	<0.18	<0.51	**81 J+**	**62**
DG-O15	3	3.5-4	DG-O15S-3.5-4	1/10/2019	**0.44 J**	**4.6**	**84**	**0.22 J**	**0.056 J**	**73 J**	**8**	**15 J**	**20**	**0.26 J-**	**0.67 J**	**36 J**	**0.62 J**	<0.12	<0.35	**38**	**77**
DG-O15	3	7.5-8	DG-O15S-7.5-8	1/10/2019	**0.31 J**	**1.5 J**	**49**	**0.21**	**0.038 J**	**45**	**8.1**	**7.1**	**3.5**	**0.032**	**0.21 J**	**25**	**0.40 J**	<0.11	<0.30	**32**	**18**
DG-O15 (D)	3	3.5-4	DG-O15 (D)S-3.5-4	1/10/2019	<0.23 UJ	**4.5**	**69**	**0.20 J**	**0.041 J**	**160 J**	**13**	**27 J**	**20**	**0.33**	**0.57 J**	**92 J**	**1.9 J**	<0.14	<0.40	**48**	**75**
DG-O7	3	0.5-1	DG-O7S-0.5-1	1/8/2019	<0.24	**0.93**	**34**	<0.096	<0.036	**8.1**	**11**	**97**	**1.2**	**0.069**	<0.19	**3.9**	**0.6**	<0.15	**1.5**	**110**	**36**
DG-O7	3	3.5-4	DG-O7S-3.5-4	1/8/2019	**0.42**	**1.5**	**32**	<0.083	<0.032	**19**	**12**	**94**	**5.9**	**0.076**	<0.16	**11**	**0.64**	<0.13	**1.5**	**110**	**38**
DG-O8	3	0.5-1	DG-O8S-0.5-1	1/29/2019	**2.2**	**110**	**62**	**0.20 J**	**0.78**	**17**	**10**	**180**	**330**	**0.23**	<0.25	**19**	**0.64 J**	<0.20	<0.56 R	**74**	**200**
DG-O8	3	3.5-4	DG-O8S-3.5-4	1/29/2019	<0.24	**1.3 J**	**41**	<0.092	<0.035	**44**	**6.2**	**5.7**	**2.8**	**0.011 J**	<0.18	**29**	<0.43	<0.14	<0.41 R	**34**	**17**
DG-O9	3	0.5-1	DG-O9S-0.5-1	12/20/2018	**0.44 J**	**1.1 J**	**34**	<0.089	<0.034	**7.3**	**12**	**100**	**27**	**0.067**	<0.18	**7.0**	<0.41	<0.14	<0.40	**83**	**49**
DG-O9	3	3.5-4	DG-O9S-3.5-4	12/20/2018	**2.8**	**15**	**61**	**0.8**	<0.044	**37**	**12**	**31**	**34**	**0.037**	<0.23	**27**	<0.53	<0.18	<0.51	**46**	**230**
DG-P10	3	0.5-1	DG-P10S-0.5-1	1/14/2019	**1.0 J**	**5.7**	**81**	**0.72**	**0.59**	**40**	**8.0**	**110**	**300**	**0.089**	**0.59 J**	**31**	<0.47	<0.16	<0.46	**72**	**130**
DG-P10	3	3.5-4	DG-P10S-3.5-4	1/14/2019	**1.8**	**3.1 U**	**78**	**0.27 J**	**0.10 J**	**46**	**8.5**	**7.9**	**11**	**0.13**	**0.47 J**	**37**	**1.3 J**	<0.16	<0.45	**47**	**43**
DG-P11	3	0.5-1	DG-P11S-0.5-1	12/20/2018	**1.6**	**1.3 J**	**48**	<0.069	**0.27 U**	**60**	**6.3**	**25**	**76**	**0.15**	<0.14	**63**	<0.32	<0.11	<0.31	**26**	**37**
DG-P12	3	0.5-1	DG-P12S-0.5-1	1/14/2019	**10**	**6.0**	**86**	**0.12 J**	**0.92**	**30**	**3.2**	**260**	**1,600**	**0.16**	**0.54 J**	**17**	**1.0 J**	**0.13 J**	<0.30	**15**	**240**
DG-P12	3	3.5-4	DG-P12S-3.5-4	1/14/2019	**28**	**9.6**	**130**	**0.30 J**	**0.21 J**	**29**	**7.5**	**860**	**1,000**	**0.29**	**1.7**	**67**	**1.5 J**	<0.16	<0.45	**94**	**140**
DG-P13	3	0.5-1	DG-P13S-0.5-1	1/10/2019	**1.0 J**	**1.4 J**	**37**	**0.17 J**	**0.26 J**	**18**	**11**	**110**	**150**	**0.038**	**0.52 J**	**7.4**	**1.6 J**	<0.17	<0.48	**110**	**110**
DG-P13	3	3.5-4	DG-P13S-3.5-4	1/10/2019	**3.6**	**16**	**72**	**0.84**	**2.3 J**	**32**	**18**	**300 J**	**790 J**	**0.053**	**1.2 J**	**47**	**2.0 J**	<0.17	**0.85 J**	**41**	**330**
DG-P13 (D)	3	3.5-4	DG-P13 (D)S-3.5-4	1/10/2019	**3.0**	**15**	**53**	**0.87**	**0.72 J**	**37**	**16**	**150 J**	**200 J**	**0.079**	**1.1 J**	**46**	**2.5 J**	<0.14	<0.40 UJ	**43**	**310**
DG-P14	3	0.5-1	DG-P14S-0.5-1	1/14/2019	**200**	**35**	**94**	**0.13 J**	**0.28 J**	**21**	**14**	**1,200**	**3,200**	**0.19**	**0.48 J**	**24**	<0.53	**0.60 J**	**1.3 J**	**96**	**240**
DG-P14	3	3.5-4	DG-P14S-3.5-4	1/14/2019	**4.7**	**14**	**1,100**	**1.4**	**0.62 J**	**140**	**19**	**220**	**920 J**	**3.4**	**1.7 J**	**130**	<0.83	**1.0 J**	**0.93 J**	**86**	**550**
DG-P14 (D)	3	3.5-4	DG-P14 (D)S-3.5-4	1/14/2019	**4.0**	**19**	**1,500**	**1.9**	**0.63 J**	**110**	**19**	**300**	**2,500 J**	**3.0**	**4.5 J**	**110**	<1.0	**0.48 J**	<0.97 UJ	**120**	**610**
DG-P15	3	0.5-1	DG-P15S-0.5-1	12/21/2018	**2.4**	**12**	**71**	**0.84**	**0.68**	**32**	**15**	**220**	**250**	**0.35**	**0.77 J**	**40**	<0.53	<0.18	<0.51	**88**	**160**
DG-P15	3	3.5-4	DG-P15S-3.5-4	12/21/2018	**1.9 U**	**3.7**	**48**	**1.2**	**0.31 J**	**440**	**39**	**62**	**13**	**0.1**	**1.1 J**	**480**	**0.80 J**	<0.19	<0.54	**95**	**84**
DG-P7	3	0.5-1	DG-P7S-0.5-1	12/18/2018	**2.8**	**20**	**130**	<0.10	**7.3**	**38**	**9.6**	**870**	**1,900**	**0.16**	**4.5**	**45**	**0.62 J**	**3.6**	<0.45	**68**	**760**
DG-P7	3	3.5-4	DG-P7S-3.5-4	12/18/2018	**0.48 J**	**0.98 J**	**32**	<0.12	**0.12 J**	**13**	**12**	**130**	**13**	**0.051**	**0.28 J**	**5.2**	<0.56	<0.19	<0.54	**110**	**58**
DG-P7	3	8.5-9	DG-P7S-8.5-9	12/18/2018	**0.64 J**	**5.5**	**39**	**0.26 J**	**0.070 J**	**56**	**6.8**	**25**	**29**	**0.22**	**0.77 J**	**44**	**0.58 J**	<0.17	<0.50	**47**	**72**
DG-P8	3	0.5-1	DG-P8S-0.5-1	12/18/2018	**0.90 J**	**18**	**68**	<0.13	**0.59**	**18**	**12**	**160**	**490**	**0.068**	**0.35 J**	**10**	<0.59	<0.20	<0.57	**120**	**120**
DG-P8	3	3.5-4	DG-P8S-3.5-4	12/18/2018	**0.65 J**	**2.4**	**41**	<0.079	<0.030	**47**	**4.6**	**6.7**	**1.1 J**	**0.47**	<0.16	**35**	<0.36	<0.12	<0.35	**40**	**19**
DG-P9	3	0.5-1	DG-P9S-0.5-1	11/21/2018	**0.56 J**	**0.79 J**	**26 J**	<0.13	**0.12 J**	**11 J**	**13 J**	**94**	**6.4**	**0.038 J-**	<0.25	**5.5**	**0.69 J**	**0.96 U**	<0.56	**110 J**	**45**
DG-P9	3	3.5-4	DG-P9S-3.5-4	11/21/2018	**5.4**	**19**	**33**	**1.1**	**0.57**	**28**	**13**	**41**	**64**	**0.19**	**0.39 J**	**38**	<0.59	**0.99 U**	<0.57	**45**	**520**
DG-Q10	3	0.5-1	DG-Q10S-0.5-1	1/14/2019	<0.47	**6.6**	**73**	**0.33**	**0.20 J**	**9.1**	**5.9**	**52**	**58**	**0.039**	**0.49 J**	**9.4**	<0.85	<0.11	**1.1 J**	**41**	**49**
DG-Q10	3	3.5-4	DG-Q10S-3.5-4	1/14/2019	**1.3**	**2.3**	**110**	**0.83**	**0.085 J**	**83**	**22**	**9.4**	**4.9**	**0.054**	**0.55 J**	**45**	**0.74 J**	<0.10	<0.29	**50**	**29**
DG-Q11	3	0.5-1	DG-Q11S-0.5-1	1/10/2019	**3.1**	**9.1**	**75**	<0.081	**0.18 J**	**21**	**13**	**170**	**420**	**0.14**	**0.51 J**	**17**	**1.5 J**	<0.13	**1.3 J**	**84**	**140**
DG-Q11	3	3.5-4	DG-Q11S-3.5-4	1/10/2019	**2.5**	**14**	**47**	**0.72**	<0.045	**37**	**18**	**77**	**48**	**0.093**	<0.23	**43**	**2.1 J**	<0.18	<0.52	**47**	**98**
DG-Q11 (D)	3	0.5-1	DG-Q11 (D)S-0.5-1	1/10/2019	**4.2**	**7.5**	**55**	<0.12	**0.13 J**	**16**	**11**	**130**	**430**	**0.16**	<0.23 UJ	**13**	**1.2 J**	<0.18	**1.1 J**	**71**	**110**
DG-Q12	3	0.5-1	DG-Q12S-0.5-1	1/14/2019	**3.4**	**6.2**	**23**	**0.15 J**	**0.35 J**	**17**	**4.7**	**180**	**380**	**0.28**	**0.69 J**	**27**	**0.52 J**	<0.15	<0.43	**21**	**77**
DG-Q12	3	3.5-4	DG-Q12S-3.5-4	1/14/2019	**0.55 J**	**2.7 J**	**25**	**0.28 J**	<0.049	**16**	**14**	**92**	**17**	**0.044**	**0.53 J**	**13**	**1.3 J**	<0.20	<0.57	**91**	**73**
DG-Q13	3	0.5-1	DG-Q13S-0.5-1	12/21/2018	**1.2**	**2.3 U**	**26**	**1.3**	**0.32**	**22**	**14**	**150**	**170**	**0.056**	**1.2**	**10**	**1.1 J**	<0.12	<0.33	**100**	**76**

Table 2: Metals Concentrations in Soil
Brisbane Baylands OU-2
Brisbane, California

Sample Location	Investigation Zone	Depth Range (ft bgs)	Sample Name	Collection Date	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
Direct Exposure Human Health Risk Level Residential Soil Exposure ESL [1]					1.1E+01	6.7E-02	1.5E+04	1.6E+01	7.8E+01	1.2E+05	2.3E+01	3.1E+03	8.0E+01	1.3E+01	3.9E+02	8.2E+02	3.9E+02	3.9E+02	7.8E-01	3.9E+02	2.3E+04
Regional Background [2]					5.5E+00	1.9E+01	3.2E+02	1.0E+00	2.7E+00	1.0E+02	2.5E+01	6.9E+01	1.6E+01	4.0E-01	7.4E+00	1.2E+02	5.6E+00	1.8E+00	7.6E+00	7.4E+01	1.1E+02
Units					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
DG-Q13	3	3.5-4	DG-Q13S-3.5-4	12/21/2018	**2.3**	**2.7 U**	**330**	**1.8**	**0.32 J**	**67**	**34**	**82**	**19**	**0.2**	**0.91 J**	**48**	**2.3 J**	<0.14	<0.39	**140**	**52**
DG-Q14	3	0.5-1	DG-Q14S-0.5-1	1/14/2019	**6.3**	**6.6**	**110**	**0.21 J**	**1.2**	**44**	**9.9**	**320**	**680**	**0.18**	**1.8 J**	**34**	<0.56	<0.19	<0.54	**66**	**400**
DG-Q14	3	3.5-4	DG-Q14S-3.5-4	1/14/2019	**0.80 J**	**2.0**	**88**	**0.36**	<0.025	**71**	**10**	**15**	**5.0**	**0.026**	<0.13	**36**	<0.31	<0.10	**1.0**	**74**	**36**
DG-Q15	3	0.5-1	DG-Q15S-0.5-1	1/11/2019	**5.8 J**	**3.4**	**51**	**0.19 J**	<0.039	**9.0 J**	**13**	**330 J**	**3,300 J**	**0.054 J**	**0.52 J**	**11 J**	**1.4 J**	<0.16	**1.4 J**	**82**	**84**
DG-Q15	3	3.5-4	DG-Q15S-3.5-4	1/11/2019	**6.8**	**11**	**450**	**0.64**	**0.5**	**57**	**11**	**170**	**270**	**0.12**	**1.1 J**	**41**	**2.7 J**	<0.14	**1.0 J**	**73**	**130**
DG-Q15	3	7.5-8	DG-Q15S-7.5-8	1/11/2019	**0.46 J**	**1.4 J**	**64**	**0.16 J**	<0.030	**39**	**2.7**	**4.5**	**4.4**	**0.0055 J**	**0.21 J**	**7.9**	<0.36	<0.12	**0.51 J**	**26**	**10**
DG-Q15 (D)	3	0.5-1	DG-Q15 (D)S-0.5-1	1/11/2019	**3.2 J**	**4.1**	**79**	**0.15 J**	<0.039	**28 J**	**12**	**160 J**	**330 J**	**0.093 J**	**0.40 J**	**23 J**	**1.8 J**	<0.16	**0.82 J**	**68**	**91**
DG-Q16	3	0.5-1	DG-Q16S-0.5-1	1/14/2019	**2.1**	**120**	**81**	**0.56**	**0.49**	**87**	**20**	**110**	**110**	**1.2**	**0.30 J**	**96**	**1.1 J**	<0.15	**0.93 J**	**75**	**150**
DG-Q16	3	3.5-4	DG-Q16S-3.5-4	1/14/2019	**2.7**	**4.0**	**110**	**0.36**	<0.034	**260**	**28**	**46**	**4.6**	**0.1**	**0.25 J**	**290**	<0.41	<0.14	**1.1 J**	**91**	**57**
DG-Q8	3	0.5-1	DG-Q8S-0.5-1	1/15/2019	**12**	**23**	**160**	**0.62**	**3.3**	**97**	**15**	**1,000**	**780**	**0.23**	**9.5**	**85**	**7.0**	<0.34	**1.7 J**	**71**	**780**
DG-Q8	3	3.5-4	DG-Q8S-3.5-4	1/15/2019	**2.6**	**4.8**	**67**	**0.44**	**0.27 J**	**20**	**9.2**	**97**	**150**	**0.16**	**0.55 J**	**18**	**0.50 J**	<0.12	**0.44 J**	**66**	**140**
DG-Q9	3	0.5-1	DG-Q9S-0.5-1	12/20/2018	**1.9**	**12**	**49**	<0.066	**0.52**	**22**	**7.7**	**97**	**280**	**0.52**	**0.19 J**	**20**	<0.30	<0.10	<0.29	**53**	**130**
DG-Q9	3	3.5-4	DG-Q9S-3.5-4	12/20/2018	**36**	**380**	**86**	**0.35**	**1.1**	**95**	**13**	**620**	**1,500**	**2.7**	**0.56 J**	**100**	<0.38	**0.53 J**	**1.7**	**54**	**230**
DG-R10	3	0.5-1	DG-R10S-0.5-1	1/29/2019	**0.75 J**	**7.2 J**	**130**	**0.38 J**	<0.10	**95**	**15**	**26**	**45**	**0.053**	<0.53	**59**	<1.3	**0.51 J**	<1.2 R	**83**	**100**
DG-R10	3	3.5-4	DG-R10S-3.5-4	1/29/2019	**4.1**	**21**	**51**	**0.86**	<0.039	**28**	**16**	**33**	**36**	**0.052**	**0.34 J**	**29**	<0.47	<0.16	<0.45 R	**33**	**91**
DG-R11	3	0.5-1	DG-R11S-0.5-1	12/20/2018	**1.0 J**	**120**	**50**	<0.12	<0.044	**57**	**8.3**	**12**	**6.4**	**0.036**	<0.23	**29**	**0.63 J**	<0.18	<0.52	**59**	**23**
DG-R11	3	3.5-4	DG-R11S-3.5-4	12/20/2018	**1.8**	**41**	**51**	**0.48**	**0.26 U**	**27**	**15**	**44**	**50**	**0.045**	**0.25 J**	**33**	<0.32	<0.11	<0.31	**32**	**87**
DG-R11	3	7.5-8	DG-R11S-7.5-8	12/20/2018	**0.90 J**	**4.6**	**27**	**0.24 J**	<0.033	**49**	**8.4**	**23**	**6.1**	**0.048**	**0.57 J**	**45**	**0.49 J**	<0.13	<0.38	**37**	**50**
DG-R12	3	0.5-1	DG-R12S-0.5-1	1/28/2019	**7.5**	**6.7**	**78**	**0.11 J**	**1.2**	**37**	**11**	**630**	**1,200**	**0.41**	**0.86 J**	**30**	**3.3 U**	**0.21 J**	<0.47 U	**62**	**450**
DG-R12	3	3.5-4	DG-R12S-3.5-4	1/28/2019	**0.52 J**	**3.3 U**	**200**	**0.26 J**	**0.29 J**	**60**	**21**	**32**	**9.7**	**0.19**	<0.21 U	**36**	**3.3 U**	<0.17 U	<0.48 U	**120**	**70**
DG-R13	3	0.5-1	DG-R13S-0.5-1	1/28/2019	**54**	**7.9**	**110**	**0.47**	**0.20 J**	**28**	**13**	**490**	**1,100**	**0.066**	**1.0 J**	**37**	<0.52	**0.23 J**	<0.50 R	**49**	**130**
DG-R13	3	3.5-4	DG-R13S-3.5-4	1/28/2019	**1.6 U**	**1.1 J**	**170**	**0.33 U**	<0.041	**64**	**17**	**27**	**13**	**0.17**	<0.21	**28**	**0.71 J**	<0.17	**0.85 R**	**130**	**44**
DG-R14	3	0.5-1	DG-R14S-0.5-1	1/28/2019	<0.32 U	**2.0 J**	**80**	**0.19 J**	**0.49 U**	**53**	**10 J**	**89**	**59**	**0.18 J**	<0.25 U	**69**	<0.58 U	<0.20 U	<0.56 U	**30 J**	**50**
DG-R14	3	3.5-4	DG-R14S-3.5-4	1/28/2019	<0.29 UJ	**1.4 J**	**74**	**0.15 J**	**0.43 U**	**50**	**8.3 J**	**38**	**44**	**0.12 J**	<0.22 U	**62**	<0.52 U	<0.18 U	**1.7 U**	**22 J**	**53**
DG-R14 (D)	3	0.5-1	DG-R14 (D)S-0.5-1	1/28/2019	<0.26 U	**3.9 J**	**120**	**0.16 J**	**0.31 J**	**59**	**18 J**	**54**	**56**	**0.077 J**	<0.20 U	**68**	<0.47 U	<0.16 U	<0.46 U	**65 J**	**60**
DG-R15	3	0.5-1	DG-R15S-0.5-1	12/21/2018	**9.9**	**4.1**	**240**	<0.098	**2.9**	**19**	**3.1**	**1,300**	**960**	**0.15**	**0.60 J**	**18**	<0.45	**0.49 J**	<0.44	**10**	**480**
DG-R15	3	3.5-4	DG-R15S-3.5-4	12/21/2018	**2.0 U**	**4.0 U**	**160**	<0.13	**1.2**	**14**	**2.7**	**90**	**610**	**0.18**	**0.40 J**	**9.5**	<0.59	<0.20	<0.57	**8.7**	**310**
DG-R16	3	0.5-1	DG-R16S-0.5-1	1/28/2019	**5.6**	**17**	**73**	**0.19 J**	**0.78**	**26**	**13**	**450**	**520**	**2.1**	**0.31 J**	**38**	<0.57 U	<0.19 U	**1.9 U**	**85**	**190**
DG-R16	3	19.5-20	DG-R16S-19.5-20	1/28/2019	**1.6 U**	**0.98 J**	**74**	**0.15 J**	**0.41 U**	**52**	**8.6**	**9.9**	**3.5**	**0.022**	<0.21 U	**32**	<0.49 U	<0.16 U	**1.6 U**	**46**	**23**
DG-R16	3	3.5-4	DG-R16S-3.5-4	1/28/2019	**1.9 U**	**56**	**86**	**0.47**	**0.46 U**	**140**	**16**	**42**	**40**	**9.3**	<0.24 U	**170**	**0.67 J**	<0.19 U	<0.54 U	**54**	**55**
DG-R8	3	0.5-1	DG-R8S-0.5-1	1/29/2019	<0.29	<0.30	**34**	**0.29 J**	<0.044	**9.4**	**9.9**	**110**	**2.9**	**0.082**	<0.22	**4.6**	<0.53	<0.18	<0.51 R	**84**	**37**
DG-R8	3	3.5-4	DG-R8S-3.5-4	1/29/2019	**0.36 J**	**1.6 J**	**29**	**0.16 J**	<0.027	**6.7**	**5.1**	**73**	**220**	**0.062**	<0.14	**2.7**	<0.33	**0.12 J**	<0.32 R	**51**	**99**
DG-R9	3	0.5-1	DG-R9S-0.5-1	1/22/2019	**2.1**	**41**	**44**	<0.086	**0.29 J**	**17**	**13**	**96**	**120**	**0.15**	**0.21 J**	**63**	**0.56 J**	<0.13	<0.38	**25**	**77**
DG-R9	3	3.5-4	DG-R9S-3.5-4	1/22/2019	**0.87 J**	**240**	**96**	**0.47**	**0.20 J**	**86**	**16**	**38**	**15**	**3.4**	<0.26	**120**	<0.60	<0.20	<0.58	**59**	**70**
DG-S10	3	0.5-1	DG-S10S-0.5-1	1/14/2019	**0.57 J**	**5**	**12**	**0.093 J**	**0.12 J**	**8.9**	**1.6**	**32**	**110**	**0.031**	**1.1 J**	**9.5**	**0.59 J**	<0.13	<0.39	**5.4**	**27**
DG-S10	3	3.5-4	DG-S10S-3.5-4	1/14/2019	**4.2**	**8.5**	**68**	**0.12 J**	**1.3**	**24**	**4.8**	**340**	**820**	**0.21**	**1.0 J**	**30**	<0.57	<0.19	<0.55	**20**	**480**
DG-S11	3	0.5-1	DG-S11S-0.5-1	1/10/2019	**0.37 J**	**1.2 J**	**55**	<0.086	<0.033	**9.7**	**7.4**	**37**	**39**	**0.049**	<0.17	**3.1**	<0.39	<0.13	**1.0 J**	**53**	**48**
DG-S11	3	3.5-4	DG-S11S-3.5-4	1/10/2019	**26**	**31**	**100**	**0.34 J**	**0.34 J**	**22**	**13**	**1,600**	**1,300**	**2.3**	**3.6**	**120**	**5.5 J**	<0.29	<0.82	**75**	**130**
DG-S12	3	0.5-1	DG-S12S-0.5-1	1/14/2019	<0.30	**4.7**	**160**	**0.36**	**0.10 J**	**81**	**20**	**34**	**9.1**	**0.097**	**0.53 J**	**92**	<0.55 UJ	<0.18	<0.53	**87**	**53**
DG-S12	3	3.5-4	DG-S12S-3.5-4	1/14/2019	**1.3**	**9.9**	**58**	**1.3**	**0.15 J**	**40**	**23**	**51**	**54**	**0.09**	**0.81 J**	**43**	**1.4 J**	<0.12	<0.35	**48**	**100**
DG-S12 (D)	3	0.5-1	DG-S12 (D)S-0.5-1	1/14/2019	<0.18	**3.1**	**140**	**0.52**	**0.031 J**	**87**	**19**	**26**	**6.6**	**0.11**	**0.57 J**	**87**	**0.56 J**	<0.11	<0.32	**69**	**42**
DG-S13	3	0.5-1	DG-S13S-0.5-1	12/21/2018	<0.27	**3.6**	**65**	**0.29 J**	**0.29 J**	**66**	**17**	**35**	**58**	**0.066**	**0.62 J**	**62**	<0.49	<0.16	<0.47	**64**	**58**
DG-S13	3	3.5-4	DG-S13S-3.5-4	12/21/2018	**0.57 J**	**2.7 J**	**62**	**0.24 J**	**0.37**	**96**	**23**	**44**	**8.3**	**0.097**	**0.76 J**	**80**	<0.41	<0.14	<0.40	**98**	**83**
DG-S14	3	0.5-1	DG-S14S-0.5-1	1/14/2019	**8.9**	**5.4**	**250**	<0.081	**1.1**	**53**	**10**	**1,100**	**1,200**	**1.1**	**1.9**	**58**	**0.85 J**	<0.13	**0.46 J**	**40**	**300**
DG-S14	3	3.5-4	DG-S14S-3.5-4	1/14/2019	**1.5 J**	**8.9**	**67**	**0.89**	<0.044	**43**	**19**	**37**	**58**	**0.028**	**0.38 J**	**40**	**0.62 J**	<0.18	<0.51	**52**	**190**
DG-S15	3	0.5-1	DG-S15S-0.5-1	1/11/2019	**130**	**21**	**48**	<0.11	**0.18 J**	**23**	**13**	**120,000**	**1,100**	**0.47**	**0.63 J**	**210**	**1.5 J**	**2.4**	**0.57 J**	**74**	**140**
DG-S15	3	3.5-4	DG-S15S-3.5-4	1/11/2019	**1.7**	**8.0**	**74**	**0.5**	<0.039	**74**	**17**	**53**	**37**	**0.15 J**	<0.20 UJ	**81**	**1.1 J**	<0.16	<0.45 UJ	**54**	**93**
DG-S15	3	6-6.5	DG-S15S-6-6.5	1/11/2019	**0.96 J**	**12**	**660**	**0.64**	**0.14 J**	**30**	**7.1**	**6,400**	**190**	**0.68**	**1.4 J**	**27**	**0.72 J**	**3.0**	**0.62 J**	**48**	**110**
DG-S15 (D)	3	3.5-4	DG-S15 (D)S-3.5-4	1/11/2019	**2.4**	**8.6**	**65**	**0.52**	<0.035	**71**	**16**	**59**	**29**	**0.075 J**	**0.54 J**	**77**	**1.0 J**	<0.14	**0.64 J**	**57**	**80**
DG-S16	3	0.5-1	DG-S16S-0.5-1	1/14/2019	**23**	**18**	**120**	**0.43**	**1.2**	**83**	**24**	**2,800**	**4,700**	**14 J**	**1.8**	**110**	**1.6 J**	**0.30 J**	**0.72 J**	**77**	**430**
DG-S16	3	3.5-4	DG-S16S-3.5-4	1/14/2019	**7.3**	**20**	**840**	**1.4**	**0.68 J**	**71**	**16**	**230**	**1,200**	**2.4**	**3.6**	**46**	**1.8 J**	**0.57 J**	**1.1 J**	**91**	**620**
DG-S16 (D)	3	0.5-1	DG-S16 (D)S-0.5-1	1/14/2019	**19**	**19**	**180**	**0.42**	**1.3**	**74**	**21**	**1,800**	**3,400**	**2.5 J**	**2.1**	**110**	**1.2 J**	<0.16 UJ	**0.63 J**	**67**	**450**
DG-S17	3	0.5-1	DG-S17S-0.5-1	2/5/2019	**5.0 J**	**570**	**84**	**0.21 J**	**0.45 J**	**71 J-**	**14**	**87**	**140 J+**	**2.1 J-**	<0.25	**85 J-**	**2.9 J**	<0.19	**0.63**	**59**	**120**

Table 2: Metals Concentrations in Soil
Brisbane Baylands OU-2
Brisbane, California

Sample Location	Investigation Zone	Depth Range (ft bgs)	Sample Name	Collection Date	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
Direct Exposure Human Health Risk Level Residential Soil Exposure ESL [1]					1.1E+01	6.7E-02	1.5E+04	1.6E+01	7.8E+01	1.2E+05	2.3E+01	3.1E+03	8.0E+01	1.3E+01	3.9E+02	8.2E+02	3.9E+02	3.9E+02	7.8E-01	3.9E+02	2.3E+04
Regional Background [2]					5.5E+00	1.9E+01	3.2E+02	1.0E+00	2.7E+00	1.0E+02	2.5E+01	6.9E+01	1.6E+01	4.0E-01	7.4E+00	1.2E+02	5.6E+00	1.8E+00	7.6E+00	7.4E+01	1.1E+02
Units					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
DG-S17	3	3.5-4	DG-S17S-3.5-4	2/5/2019	**1.7 J**	**52**	**48**	**0.69**	<0.044	**33**	**15**	**30**	**13**	**0.14**	<0.23	**31**	**1.9 J**	<0.18	**0.69**	**44**	**92**
DG-S9	3	0.5-1	DG-S9S-0.5-1	12/20/2018	**1.8**	**3.3**	**67**	<0.10	**0.4**	**15**	**11**	**92**	**98**	**0.064**	**0.28 J**	**13**	<0.48	<0.16	<0.46	**74**	**130**
DG-S9	3	3.5-4	DG-S9S-3.5-4	12/20/2018	<0.26	**1.0 J**	**42**	<0.10	<0.039	**7.4**	**10**	**140**	**4**	**0.043**	<0.20	**9.7**	**0.81 J**	<0.16	<0.46	**88**	**38**
DG-S9	3	4.5-5	DG-S9S-4.5-5	12/20/2018	**6.2**	**110**	**100**	**0.16 J**	**26**	**29**	**9.4**	**210**	**500**	**0.12**	<0.24	**36**	<0.57	<0.19	<0.55	**53**	**4,500**
DG-T10	3	0.5-1	DG-T10S-0.5-1	1/14/2019	**0.52 J**	**32**	**61**	**0.21 J**	<0.039	**14**	**13**	**190**	**44**	**0.039**	**0.45 J**	**11**	**0.99 J**	<0.16	<0.46	**120**	**50**
DG-T10	3	3.5-4	DG-T10S-3.5-4	1/14/2019	**1.2**	**110**	**79**	**0.7**	**0.18 J**	**120**	**20**	**67**	**27**	**0.71**	**0.60 J**	**150**	**1.7 J**	<0.10	<0.29	**56**	**84**
DG-T11	3	0.5-1	DG-T11S-0.5-1	12/21/2018	**2.2**	**4.8**	**49**	**0.33 J**	**0.88**	**25**	**5.1**	**150**	**4,600**	**0.3**	**0.86 J**	**17**	<0.57	<0.19	<0.55	**28**	**270**
DG-T11	3	3.5-4	DG-T11S-3.5-4	12/21/2018	**8.1**	**4.3**	**43**	**0.65**	**0.55**	**36**	**7.7**	**1,000**	**550**	**0.37**	**0.64 J**	**24**	<0.36	<0.12	<0.35	**55**	**130**
DG-T12	3	0.5-1	DG-T12S-0.5-1	1/14/2019	**33**	**9.3**	**220**	**0.24 J**	**1.5**	**52**	**9.6**	**4,600**	**1,100**	**0.3**	**2.7**	**69**	**1.6 J**	**3.1**	<0.56	**53**	**550**
DG-T12	3	3.5-4	DG-T12S-3.5-4	1/14/2019	**1.2 J**	**8.1**	**160**	**0.47**	**0.45 J**	**95**	**15**	**150**	**91**	**2.5**	**0.85 J**	**130**	<0.58	<0.20	<0.56	**64**	**420**
DG-T13	3	0.5-1	DG-T13S-0.5-1	1/10/2019	**4.9 J**	**4.3 J**	**80**	**0.23**	**0.25 J**	**20 J**	**11 J**	**430 J**	**410 J**	**0.21 J**	**1.4 J**	**26 J**	**1.4 J**	<0.11	<0.33	**87**	**110 J**
DG-T13	3	3.5-4	DG-T13S-3.5-4	1/10/2019	**0.70 J**	**2.9**	**71 J+**	**0.12 J**	<0.034	**71 J+**	**7.9**	**12**	**6.3**	**0.2**	**0.18 J**	**50 J**	**1.0 J**	<0.14	**0.65 J**	**46**	**25**
DG-T13 (D)	3	0.5-1	DG-T13 (D)S-0.5-1	1/10/2019	**15 J**	**19 J**	**120**	<0.30	**1.3 J**	**60 J**	**25 J**	**1,300 J**	**2,500 J**	**0.56 J**	**6.8 J**	**130 J**	<1.4 UJ	<0.47	<1.3	**66**	**310 J**
DG-T14	3	0.5-1	DG-T14S-0.5-1	1/14/2019	**2.5**	**3.8**	**110**	**0.22**	**0.67**	**200**	**25**	**64**	**210**	**0.25**	**0.39 J**	**400**	**0.48 J**	<0.11	**0.49 J**	**40**	**360**
DG-T14	3	3.5-4	DG-T14S-3.5-4	1/14/2019	**4.5**	**2.2 J**	**71**	**0.12 J**	**0.99**	**360**	**34**	**85**	**170**	**0.28**	**0.16 J**	**650**	**1.1 J**	<0.12	**0.75 J**	**38**	**160**
DG-T15	3	0.5-1	DG-T15S-0.5-1	12/21/2018	**2.6**	**3.5 U**	**45**	**0.38**	**0.29 J**	**380**	**33**	**25**	**61**	**2.4**	**0.42 J**	**530**	<0.52	<0.18	<0.50	**38**	**48**
DG-T15	3	3.5-4	DG-T15S-3.5-4	12/21/2018	**1.7**	<0.28	**49**	**0.5**	**0.20 J**	**490**	**53**	**30**	**5.6**	**0.054**	**0.53 J**	**880**	**0.75 J**	<0.17	<0.48	**54**	**52**
DG-T16	3	0.5-1	DG-T16S-0.5-1	1/24/2019	**4.7**	**14**	**32**	<0.12	**0.65**	**35**	**8.9**	**140**	**280**	**0.15**	**0.39 J**	**24**	**1.1 J**	<0.19	<0.55 R	**44**	**63**
DG-T16	3	3.5-4	DG-T16S-3.5-4	1/24/2019	**0.34 J**	**0.90 J**	**35**	<0.11	**0.040 J**	**20**	**7.1**	**48**	**18**	**0.058**	<0.21	**11**	<0.49	<0.16	<0.47 R	**51**	**25**
DG-T17	3	0.5-1	DG-T17S-0.5-1	1/28/2019	**1.2 J**	**4.2 J**	**140**	<0.49	**0.57 J**	**27**	**5.9**	**55**	**110**	**0.073**	<0.96	**26**	**2.6 J**	<0.75	**13 R**	**34**	**110**
DG-T17	3	3.5-4	DG-T17S-3.5-4	1/28/2019	**0.81 J**	**23 J**	**68 J**	<0.13	**0.39 J**	**13 J**	**9.0 J**	**120**	**95 J**	**0.091**	**0.37 J**	**11 J**	**1.2 J**	<0.19	**39 R**	**99 J**	**71**
DG-T17	3	7-7.5	DG-T17S-7-7.5	1/28/2019	**2.3 J**	**12**	**400**	**0.90 J**	**2.1**	**34**	**8.2**	**2,300 J**	**3,300 J**	**1.2**	**1.3 J**	**26**	<0.53	**2.4 J**	**20 R**	**52**	**1,000 J**
DG-T17 (D)	3	7-7.5	DG-T17 (D)S-7-7.5	1/28/2019	**1.3 UJ**	**14**	**540**	**1.6 J**	**2.3**	**21**	**8.8**	**89 J**	**1,600 J**	**0.86**	**1.1 J**	**23**	<0.39	**0.51 J**	<0.38 R	**51**	**450 J**
DG-T9	3	0.5-1	DG-T9S-0.5-1	1/10/2019	<0.27	**0.66 J**	**27**	<0.11	**0.12 J**	**8.6**	**12**	**110**	**20**	**0.054**	**0.22 J**	**4.4**	**0.78 J**	<0.16	**1.4 J**	**100**	**76**
DG-T9	3	3.5-4	DG-T9S-3.5-4	1/10/2019	<0.28	<0.29	**20**	<0.11	<0.042	**7.8**	**7.1**	**81**	**2.2**	**0.038**	<0.22	**2.3**	<0.51	<0.17	**1.0 J**	**74**	**20**
DG-U10	3	0.5-1	DG-U10S-0.5-1	1/14/2019	**2.4**	**2.3 J**	**43**	**0.19 J**	**0.25 J**	**17**	**14**	**220**	**170**	**0.075**	**1.1 J**	**13**	**2.2 J**	<0.18	<0.52	**110**	**130**
DG-U10	3	3.5-4	DG-U10S-3.5-4	1/14/2019	**30**	**32**	**150**	**0.31**	**0.76**	**27**	**10**	**1,400**	**1,500**	**0.15**	**1.5**	**62**	**2.1 J**	**0.50 J**	<0.44	**94**	**320**
DG-U11	3	0.5-1	DG-U11S-0.5-1	1/10/2019	**34**	**11**	**68**	<0.10	**0.20 J**	**17**	**8.8**	**150**	**840**	**0.12**	<0.20	**12**	<0.46	<0.16	**1.3 J**	**65**	**120**
DG-U11	3	3.5-4	DG-U11S-3.5-4	1/10/2019	**1.6 J**	**8.7**	**130**	**0.61**	**0.46**	**35**	**11**	**34**	**94**	**0.16**	<0.22	**53**	**0.89 J**	<0.17	**1.1 J**	**39**	**290**
DG-U12	3	0.5-1	DG-U12S-0.5-1	1/28/2019	**1.7**	**3.3**	**31**	<0.10 U	**0.26 J**	**10**	**8.2**	**110**	**110**	**0.093**	<0.20 U	**10**	**3.1 U**	<0.16 U	<0.46 U	**76**	**80**
DG-U12	3	3.5-4	DG-U12S-3.5-4	1/28/2019	**8.4**	**59 J**	**44 J**	**1.3**	**3.4**	**73 J**	**19**	**110**	**1,700 J**	**6.3**	**1.2 J**	**58**	**7.9 U**	<0.40 U	<1.2 UJ	**31**	**790**
DG-U12 (D)	3	3.5-4	DG-U12 (D)S-3.5-4	1/28/2019	**12**	**13 J**	**74 J**	**1.0**	**3.7**	**210 J**	**15**	**68**	**20,000 J**	**8.9**	**1.1 J**	**48**	**2.8 J**	<0.19 U	<0.53 UJ	**39**	**990**
DG-U13	3	0.5-1	DG-U13S-0.5-1	12/21/2018	**0.87 J**	**2.8**	**140**	**0.62**	**0.27 J**	**120**	**35**	**22**	**63**	**0.24**	**0.38 J**	**240**	**0.71 J**	<0.13	<0.37	**41**	**62**
DG-U13	3	3.5-4	DG-U13S-3.5-4	12/21/2018	**1.4**	<0.20	**39**	**0.72**	**0.14 J**	**1200**	**98**	**22**	**3.4**	**0.056**	**0.80 J**	**1700**	**2.2 J**	<0.12	<0.34	**45**	**31**
DG-U14	3	0.5-1	DG-U14S-0.5-1	1/24/2019	**0.57 J**	**2.4 J**	**28**	**0.21 J**	**0.062 J**	**18**	**6.5**	**19**	**21**	**0.045**	<0.21 U	**20**	**0.60 J**	<0.17 U	<0.48 R	**39 J**	**36**
DG-U14	3	3.5-4	DG-U14S-3.5-4	1/24/2019	**0.42 J**	**1.3 J**	**35**	**0.13 J**	**0.063 J**	**54**	**7.8**	**8.2**	**2.3**	**0.032**	<0.23	**22**	<0.53	<0.18	<0.51 R	**61**	**21**
DG-U14 (D)	3	3.5-4	DG-U14 (D)S-3.5-4	1/24/2019	**1.4 J**	**1.5 J**	**36**	<0.079 UJ	**0.29 J**	**51**	**6.5**	**8.4**	**1.6**	**0.021**	<0.16	**17**	<0.36	**0.15 J**	<0.35 R	**55**	**18**
DG-U15	3	3.5-4	DG-U15S-3.5-4	1/28/2019	**1.1 J**	**2.6 J**	**27**	<0.12	**0.17 J**	**14**	**12**	**100**	**24**	**0.058**	<0.23	**8.4**	<0.54	<0.18	**34 R**	**84**	**54**
DG-U15	3	8.5-9	DG-U15S-8.5-9	1/28/2019	**1.6 J**	**7.1**	**55**	**0.43**	**0.18 J**	**28**	**13**	**26**	**8.1**	**0.11**	<0.23	**28**	**2.1 J**	<0.18	**14 R**	**37**	**47**
DG-U16	3	0.5-1	DG-U16S-0.5-1	1/24/2019	**1.4 J**	**2.6 J**	**32**	**0.21 J**	**0.24 J**	**12**	**13**	**150**	**120**	**0.092**	<0.21	**10**	**0.81 J**	<0.17	<0.48 R	**95**	**71**
DG-U16	3	3.5-4	DG-U16S-3.5-4	1/24/2019	**0.41 J**	**0.73 J**	**65**	**0.21 J**	**0.20 J**	**67**	**17**	**17**	**6.3**	**0.05**	<0.15	**27**	<0.36	<0.12	<0.35 R	**120**	**49**
DG-U17	3	0.5-1	DG-U17S-0.5-1	1/24/2019	**4.8**	**11**	**190**	**0.22 J**	**1.2**	**35**	**6.7**	**69**	**4,900**	**0.3**	**1.0 J**	**27**	**2.0 J**	<0.19	<0.54 R	**48**	**200**
DG-U17	3	0.5-1	DG-U17S-0.5-1	1/28/2019	**1.1 J**	**3.5**	**63**	**0.20 J**	**0.42**	**14**	**5.2**	**72**	**160**	**0.24**	**0.83 J**	**16**	<0.45	<0.15	<0.43 R	**35**	**280**
DG-U17	3	3.5-4	DG-U17S-3.5-4	1/24/2019	**4.6**	**4.4**	**150**	**0.5**	**0.45**	**180**	**24**	**41**	**13**	**18**	**0.30 J**	**210**	**1.9 J**	<0.12	<0.35 R	**79**	**65**
DG-U18	3	0.5-1	DG-U18S-0.5-1	1/24/2019	**1.6**	**38**	**78**	**0.44**	**0.73**	**60**	**12**	**52**	**130**	**0.32**	**0.56 J**	**56**	**0.65 J**	<0.15	<0.44 R	**59**	**150**
DG-U18	3	3.5-4	DG-U18S-3.5-4	1/24/2019	**1.9**	**98**	**72**	**0.45**	**0.42**	**68**	**14**	**32**	**35**	**0.43**	<0.20	**53**	**0.98 J**	<0.15	<0.44 R	**54**	**130**
DG-V10	3	0.5-1	DG-V10S-0.5-1	1/14/2019	**1.0 J**	**3.0 J**	**58**	**0.22 J**	**0.52**	**16**	**11**	**170**	**93**	**0.1**	**1.4 J**	**11**	**1.5 J**	<0.17	<0.48	**110**	**190**
DG-V10	3	3.5-4	DG-V10S-3.5-4	1/14/2019	**12**	**22**	**84**	**0.36**	**0.60 J**	**22**	**13**	**590**	**950**	**0.17**	**3.3**	**94**	**3.7 J**	<0.28	<0.81	**74**	**170**
DG-V11	3	0.5-1	DG-V11S-0.5-1	12/21/2018	**1.9**	**29**	**70**	**1.1**	**0.31**	**16**	**8.9**	**120**	**180**	**0.11**	**0.42 J**	**11**	<0.34	<0.11	<0.33	**85**	**94**
DG-V11	3	3.5-4	DG-V11S-3.5-4	12/21/2018	**10**	**15**	**570**	**1.1**	**1.3**	**54**	**8.9**	**210**	**1,800**	**0.056**	**1.2**	**37**	<0.35	**2.2**	<0.34	**48**	**780**
DG-V12	3	0.5-1	DG-V12S-0.5-1	1/28/2019	**1.0 J**	**3.6 U**	**30**	<0.12 U	**0.15 J**	**10**	**11**	**110**	**63**	**0.076**	<0.23 U	**10**	**3.6 U**	<0.18 U	<0.52 U	**72**	**55**
DG-V12	3	3.5-4	DG-V12S-3.5-4	1/28/2019	<0.30 U	**5.2**	**70**	**0.33 J**	**0.12 J**	**54**	**15**	**30**	**7.4**	**0.031**	<0.23 U	**33**	**3.6 U**	<0.18 U	<0.53 U	**52**	**47**
DG-V13	3	0.5-1	DG-V13S-0.5-1	1/10/2019	**4.2**	**7.1**	**66**	**0.25 J**	**0.36 J**	**36**	**8.7**	**120**	**360**	**0.097**	**0.76 J**	**33**	**0.59 J**	<0.16	<0.47	**64**	**230**

Table 2: Metals Concentrations in Soil
Brisbane Baylands OU-2
Brisbane, California

Sample Location	Investigation Zone	Depth Range (ft bgs)	Sample Name	Collection Date	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
Direct Exposure Human Health Risk Level Residential Soil Exposure ESL [1]					1.1E+01	6.7E-02	1.5E+04	1.6E+01	7.8E+01	1.2E+05	2.3E+01	3.1E+03	8.0E+01	1.3E+01	3.9E+02	8.2E+02	3.9E+02	3.9E+02	7.8E-01	3.9E+02	2.3E+04
Regional Background [2]					5.5E+00	1.9E+01	3.2E+02	1.0E+00	2.7E+00	1.0E+02	2.5E+01	6.9E+01	1.6E+01	4.0E-01	7.4E+00	1.2E+02	5.6E+00	1.8E+00	7.6E+00	7.4E+01	1.1E+02
Units					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
DG-V13	3	3.5-4	DG-V13S-3.5-4	1/10/2019	**2.4**	**5.4**	**63**	**0.24 J**	**0.37**	**43**	**7.7**	**120**	**280**	**0.086**	**0.67 J**	**36**	**0.89 J**	**0.42 J**	<0.40	**64**	**120**
DG-V13	3	7.5-8	DG-V13S-7.5-8	1/10/2019	**1.8**	**6.2**	**100**	**0.66**	<0.041	**59**	**14**	**28**	**9.3**	**0.059**	**0.53 J**	**39**	**1.1 J**	<0.17	<0.48	**59**	**59**
DG-V14	3	0.5-1	DG-V14S-0.5-1	1/23/2019	<5.0	**3.9**	**45**	<0.25	**0.51**	**20**	**9.9**	**120**	**390**	**0.2**	<1.0	**35**	<1.7	<0.89	<5.0	**77**	**190**
DG-V14	3	3.5-4	DG-V14S-3.5-4	1/23/2019	<5.0	**7.2**	**49**	**0.56**	<0.25	**38**	**10**	**42**	**6.4**	**0.027**	<0.99	**31**	<1.7	<0.88	<5.0	**56**	**47**
DG-V15	3	0.5-1	DG-V15S-0.5-1	1/23/2019	**10 U**	**11**	**120**	**0.28 J**	**1.1**	**38**	**11**	**270**	**1,800**	**0.037**	**1.1 J**	**77**	<1.7	<0.89	<5.0	**78**	**540**
DG-V15	3	3.5-4	DG-V15S-3.5-4	1/23/2019	<5.0	**1.6 J**	**65**	**0.63**	**0.32 J**	**87**	**24**	**31**	**2.7**	**0.031**	<0.99	**39**	<1.7	<0.88	<5.0	**170**	**52**
DG-V16	3	0.5-1	DG-V16S-0.5-1	1/24/2019	**1.4 J**	**1.5 J**	**35**	**0.27 J**	**0.29 J**	**12**	**8.9**	**110**	**71**	**0.086**	**0.29 J**	**12**	<0.55	<0.19	<0.53 R	**74**	**56**
DG-V17	3	0.5-1	DG-V17S-0.5-1	1/28/2019	**4.6**	**11**	**89**	<0.11	**2.9**	**24**	**12**	**140**	**640**	**0.1**	**0.23 J**	**26**	**3.2 J**	<0.17	**30 R**	**77**	**2,300**
DG-V17	3	3.5-4	DG-V17S-3.5-4	1/28/2019	**1.9 J**	**3.3 J**	**64**	<0.13 UJ	**0.27 J**	**33**	**18**	**47**	**14 J**	**0.028 J**	<0.26	**21**	**1.2 J**	<0.20	**32 R**	**81**	**62 J**
DG-V17	3	9.5-10	DG-V17S-9.5-10	1/28/2019	**6.7**	**13**	**460**	**0.49**	**2.0**	**37**	**11**	**440**	**4,900**	**1.0**	**1.5 J**	**39**	**2.4 J**	**2.9**	**19 R**	**50**	**2,100**
DG-V17 (D)	3	3.5-4	DG-V17 (D)S-3.5-4	1/28/2019	**1.5 J**	**4.8 J**	**70**	**0.16 J**	**0.29 J**	**37**	**17**	**49**	**34 J**	**0.048 J**	<0.21	**24**	**1.2 J**	<0.17	**27 R**	**69**	**120 J**
DG-V18	3	0.5-1	DG-V18S-0.5-1	1/24/2019	**1.2 U**	**2.4**	**52**	<0.078	**0.16 J**	**9.7**	**5.6**	**29**	**22**	**0.073**	<0.15	**15**	**0.59 J**	<0.12	<0.35 R	**39**	**40**
DG-V18	3	3.5-4	DG-V18S-3.5-4	1/24/2019	**0.55 J**	**34**	**33**	**0.075 J**	**0.087 J**	**8.7**	**9.5**	**97**	**1.2**	**0.049**	<0.14	**2.8**	<0.33	<0.11	<0.32 R	**92**	**32**
DG-AA10	4	0.5-1	DG-AA10S-0.5-1	1/29/2019	**2.2**	**2.9**	**47**	<0.080	**0.47**	**9.3**	**8.1**	**120**	**150**	**0.069**	**0.24 J**	**7.7**	<0.37	<0.12	**0.8**	**71**	**84**
DG-AA10	4	3.5-4	DG-AA10S-3.5-4	1/29/2019	**45**	**20**	**1,400**	**0.35 J**	**4.2**	**51**	**5.8**	**880**	**11,000**	**0.61**	<0.50	**41**	**3.4 J**	**11**	<1.1	**29**	**3,400**
DG-AA11	4	0.5-1	DG-AA11S-0.5-1	1/29/2019	**0.38 J**	**0.35 J**	**7.8**	<0.079	**0.077 J**	**18**	**10**	**51**	**3.7**	**0.076**	<0.16	**7.5**	<0.37	<0.12	<0.35 R	**67**	**36**
DG-AA11	4	3.5-4	DG-AA11S-3.5-4	1/29/2019	<0.21	**0.48 J**	**19**	<0.084	**0.052 J**	**9.0**	**11**	**88**	**22**	**0.066**	**0.35 J**	**4.1**	<0.39	<0.13	<0.37 R	**93**	**55**
DG-AA12	4	0.5-1	DG-AA12S-0.5-1	1/25/2019	**9.8**	**4.9**	**48**	<0.077	**0.62**	**21**	**12**	**390**	**710**	**1.3**	**0.26 J**	**21**	**2.4 U**	<0.12	<0.34	**91**	**120**
DG-AA12	4	3.5-4	DG-AA12S-3.5-4	1/25/2019	**2.4**	**5.2**	**61**	<0.11	**0.68**	**35**	**12**	**170**	**620**	**1.8**	<0.22	**48**	**3.4 U**	<0.17	<0.50	**70**	**160**
DG-AA13	4	0.5-1	DG-AA13S-0.5-1	1/24/2019	**2.9**	**1.6 J**	**27**	<0.083	**0.34**	**11**	**7.7**	**200**	**150**	**0.11**	<0.16	**11**	**0.39 J**	<0.13	**1.0 R**	**75**	**49**
DG-AA13	4	3.5-4	DG-AA13S-3.5-4	1/24/2019	**1.7 U**	**1.8 J**	**14**	<0.11	**0.21 J**	**9.6**	**17**	**89**	**31**	**0.049**	<0.21	**8.2**	<0.50	<0.17	<0.48 R	**100**	**57**
DG-AA14	4	0.5-1	DG-AA14S-0.5-1	1/24/2019	**1.6 J**	**3.1 J**	**54**	<0.12	**0.93**	**17**	**3.7**	**83**	**190**	**0.095**	**1.1 J**	**10**	<0.54	**0.28 J**	<0.52 R	**36**	**110**
DG-AA14	4	3.5-4	DG-AA14S-3.5-4	1/24/2019	**1.3 J**	**4.0**	**57**	<0.11	**0.63**	**21**	**5.4**	**130**	**220**	**0.32**	**0.89 J**	**15**	**0.50 J**	**0.25 J**	<0.49 R	**49**	**150**
DG-AA15	4	0.5-1	DG-AA15S-0.5-1	1/22/2019	**1.7**	**3.6**	**38**	**0.13 J**	**0.26 J**	**27**	**5.5**	**74**	**120**	**0.19**	**0.20 J**	**26**	<0.43	<0.15	<0.42	**36**	**53**
DG-AA16	4	0.5-1	DG-AA16S-0.5-1	1/24/2019	**3.5**	**3.4 J**	**59**	<0.12	**0.67**	**19**	**5.7**	**160**	**180**	**0.058**	**0.50 J**	**69**	<0.57	<0.19	**0.96 R**	**93**	**94**
DG-AA16	4	3.5-4	DG-AA16S-3.5-4	1/24/2019	**92**	**23**	**48**	<0.078	**0.6**	**20**	**3.5**	**490**	**2,500**	**0.065**	**0.43 J**	**42**	<0.36	**0.13 J**	**0.64 R**	**48**	**73**
DG-AA17	4	0.5-1	DG-AA17S-0.5-1	2/5/2019	**0.59 J**	**2.6**	**63**	**0.19 J**	<0.030	**23**	**9.7**	**40**	**28**	**0.059**	**0.63 J**	**30**	**1.1 J**	<0.12	**0.46**	**44**	**42**
DG-AA17	4	3.5-4	DG-AA17S-3.5-4	2/5/2019	**2.9**	**7.4**	**88**	<0.12	**2.8**	**37**	**16**	**250**	**300**	**0.35**	**3.3**	**30**	**2.7 J**	**0.44 J**	**2.1**	**91**	**830**
DG-AA18	4	0.5-1	DG-AA18S-0.5-1	1/23/2019	<5.0	**6.9**	**94**	**0.32 J**	**0.31 J**	**32**	**7.7**	**47**	**100**	**0.08**	<1.0	**31**	<1.7	<0.89	<5.0	**37**	**89**
DG-AA18	4	3.5-4	DG-AA18S-3.5-4	1/23/2019	**10 U**	**6.2**	**100**	<0.25 UJ	**0.59**	**210**	**5.2**	**180**	**330**	**0.18**	<1.0	**55**	<1.7	<0.89	<5.0	**48**	**170**
DG-AA18 (D)	4	3.5-4	DG-AA18 (D)S-3.5-4	1/23/2019	**10 U**	**8.1**	**110**	**0.29 J**	**0.76**	**160**	**6.8**	**170**	**390**	**0.21**	<1.0	**53**	<1.7	<0.89	<5.0	**49**	**190**
DG-AA19	4	0.5-1	DG-AA19S-0.5-1	1/24/2019	**0.76 J**	**2.2 J**	**23**	<0.10	**0.15 J**	**33**	**6.9**	**9.4**	**5.2**	**0.026**	**0.21 J**	**30**	**0.94 J**	<0.16	<0.46	**34**	**30**
DG-AA19	4	3.5-4	DG-AA19S-3.5-4	1/24/2019	**0.60 J**	**3.9**	**92**	<0.12	**0.11 J**	**140**	**17**	**31**	**27**	**0.83**	<0.23	**120**	<0.54	<0.18	<0.52 R	**58**	**70**
DG-AA19	4	8.5-9	DG-AA19S-8.5-9	1/24/2019	**1.6 J**	**9.2**	**71**	**0.62**	**0.089 J**	**64**	**11**	**28**	**10**	**0.029**	<0.25	**25**	<0.58	<0.19	<0.56 R	**61**	**37**
DG-AB10	4	0.5-1	DG-AB10S-0.5-1	1/29/2019	**210 J**	**25 J**	**130 J**	<0.25	**2.4 J**	**34 J**	**11**	**670 J**	**5,200**	**6.9 J**	**1.5 J**	**34 J**	**3.3 J**	**0.83 J**	<1.1	**52**	**840 J**
DG-AB10	4	3.5-4	DG-AB10S-3.5-4	1/29/2019	**9.1**	**12**	**500**	**0.43**	**1.8**	**41**	**8.7**	**3,500**	**1,100**	**0.41**	**0.56 J**	**34**	**2.8 J**	**4.3**	<0.43	**39**	**940**
DG-AB10 (D)	4	0.5-1	DG-AB10 (D)S-0.5-1	1/29/2019	**1.2 J**	**0.52 J**	**33 J**	<0.075	**0.30 J**	**14 J**	**7.9**	**110 J**	**67**	**0.031 J**	**0.18 J**	**3.7 J**	**0.59 J**	<0.12 UJ	<0.33	**62**	**47 J**
DG-AB11	4	0.5-1	DG-AB11S-0.5-1	1/28/2019	**1.5 U**	**3.0 U**	**24**	<0.096 U	**0.37**	**16**	**13**	**89**	**65**	**0.097**	**2.0**	**11**	<0.44 U	<0.15 U	<0.43 U	**87**	**73**
DG-AB11	4	3.5-4	DG-AB11S-3.5-4	1/28/2019	**4.1**	**9.1**	**74**	<0.11 U	**0.83**	**21**	**11**	**160**	**590**	**0.53**	**0.47 J**	**18**	<0.49 U	<0.16 U	<0.47 U	**84**	**200**
DG-AB12	4	0.5-1	DG-AB12S-0.5-1	1/25/2019	**6.4**	**11**	**150**	<0.091	**2.5**	**71**	**13**	**570**	**830**	**0.61**	**5.3**	**72**	<0.42	<0.14	<0.41	**70**	**260**
DG-AB12	4	3.5-4	DG-AB12S-3.5-4	1/25/2019	**250 J**	**38 J**	**170 J**	<0.20	**2.2**	**55 J**	**16 J**	**4,400 J**	**4,200 J**	**0.36**	**1.6 J**	**81 J**	**6.1 U**	**1.6**	<0.88	**67 J**	**930 J**
DG-AB13	4	0.5-1	DG-AB13S-0.5-1	1/22/2019	**540**	**22**	**180**	<0.23	**1.8**	**76**	**19**	**3,000**	**7,400**	**0.35**	**6.2**	**170**	**3.2 J**	<0.36	<1.0	**74**	**1,300**
DG-AB13	4	13.5-14	DG-AB13S-13.5-14	1/22/2019	**2.3**	**8.9**	**35**	**0.42**	**0.20 J**	**25**	**10**	**44**	**62**	**0.0070 J**	**1.1 J**	**40**	<0.52	<0.18	**0.79 J**	**41**	**84**
DG-AB13	4	3.5-4	DG-AB13S-3.5-4	1/22/2019	**37 J**	**12 J**	**30**	<0.10	**0.25 J**	**19**	**3.0**	**120 J**	**480 J**	**0.028**	<0.20	**23 J**	<0.47	<0.16	<0.45	**10**	**100 J**
DG-AB13 (D)	4	3.5-4	DG-AB13 (D)S-3.5-4	1/22/2019	**15 J**	**3.4 J**	**22**	<0.10	**0.12 J**	**14**	**1.9**	**43 J**	**160 J**	**0.02**	<0.20	**13 J**	<0.47	<0.16	<0.45	**8.2**	**35 J**
DG-AB14	4	0.5-1	DG-AB14S-0.5-1	1/31/2019	**4.4**	**3.0 J**	**64**	**0.43**	**0.23 J**	**13**	**6.8**	**130**	**270**	**0.031**	**0.73 J**	**99**	**3.9 U**	<0.20	<0.56 R	**130**	**76**
DG-AB14	4	3.5-4	DG-AB14S-3.5-4	1/31/2019	**8.4**	**6.3**	**35 J**	**0.38 U**	**1.7 J**	**15**	**5.8**	**220**	**950**	**0.034 J**	**0.29 J**	**77**	**3.8 U**	<0.19	<0.55 R	**67**	**72**
DG-AB14 (D)	4	3.5-4	DG-AB14 (D)S-3.5-4	1/31/2019	**8.6**	**5.0**	**120 J**	**0.34 U**	**0.55 J**	**14**	**5.2**	**170**	**640**	**0.015 J**	**0.26 J**	**73**	**3.4 U**	<0.17	<0.49 R	**70**	**68**
DG-AB15	4	0.5-1	DG-AB15S-0.5-1	2/1/2019	**3.5 J-**	**6.7 U**	**90 J**	**0.32 J**	**1.1**	**14**	**5.3**	**110 J**	**280 J**	**0.51 J-**	**0.93 J**	**46 J**	<1.0	<0.34	<0.97 R	**56 J**	**130 J+**
DG-AB15	4	3.5-4	DG-AB15S-3.5-4	2/1/2019	**0.78 J**	**2.5 U**	**100**	**0.37**	**0.067 J**	**61**	**8.4**	**13**	**5.0**	**0.0088 J**	<0.16	**21**	<0.38	<0.13	<0.36 R	**70**	**28**
DG-AC10	4	0.5-1	DG-AC10S-0.5-1	1/29/2019	**2.7**	**3.8**	**150**	<0.079	**1.6**	**16**	**11**	**210**	**180**	**0.1**	**3.5**	**9.7**	**0.49 J**	**0.13 J**	**0.55**	**63**	**440**
DG-AC10	4	3.5-4	DG-AC10S-3.5-4	1/29/2019	**0.40 J**	<0.25	**31**	<0.094	**0.054 J**	**7.5**	**8.5**	**110**	**29**	**0.061**	<0.19	**2.8**	<0.43	<0.15	<0.42	**74**	**26**
DG-AC11	4	0.5-1	DG-AC11S-0.5-1	1/29/2019	<0.17	**1.2 J**	**17**	**0.14 J**	**0.088 J**	**15**	**11**	**62**	**16**	**0.057**	**0.45 J**	**9.1**	<0.31	<0.11	<0.30 R	**79**	**50**

Table 2: Metals Concentrations in Soil
Brisbane Baylands OU-2
Brisbane, California

Sample Location	Investigation Zone	Depth Range (ft bgs)	Sample Name	Collection Date	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
Direct Exposure Human Health Risk Level Residential Soil Exposure ESL [1]					1.1E+01	6.7E-02	1.5E+04	1.6E+01	7.8E+01	1.2E+05	2.3E+01	3.1E+03	8.0E+01	1.3E+01	3.9E+02	8.2E+02	3.9E+02	3.9E+02	7.8E-01	3.9E+02	2.3E+04
Regional Background [2]					5.5E+00	1.9E+01	3.2E+02	1.0E+00	2.7E+00	1.0E+02	2.5E+01	6.9E+01	1.6E+01	4.0E-01	7.4E+00	1.2E+02	5.6E+00	1.8E+00	7.6E+00	7.4E+01	1.1E+02
Units					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
DG-AC11	4	3.5-4	DG-AC11S-3.5-4	1/29/2019	**1.6 J**	**17**	**55**	**0.44**	**0.19 J**	**26**	**13**	**86**	**67**	**4.5**	<0.24	**37**	**1.3 J**	<0.19	<0.55 R	**54**	**80**
DG-AC11	4	8.5-9	DG-AC11S-8.5-9	1/29/2019	**0.26 J**	**6.2**	**130**	**0.22 J**	**0.17 J**	**39**	**8.1**	**15**	**24**	**0.029**	<0.15	**32**	<0.34	<0.11	<0.33 R	**33**	**61**
DG-AC12	4	0.5-1	DG-AC12S-0.5-1	1/31/2019	**3.2**	**13**	**13**	<0.090 U	**0.94**	**23**	**2.5**	**130**	**590**	**0.074**	**0.86 J**	**8.6**	**0.70 J**	**0.41 J**	<0.40 U	**4.4**	**440**
DG-AC12	4	3.5-4	DG-AC12S-3.5-4	1/31/2019	**0.71 J**	**3.5**	**30**	<0.11 U	**0.071 J**	**8.9**	**7.2**	**190**	**97**	**0.091**	<0.22 U	**20**	<0.51 U	<0.17 U	<0.50 U	**79**	**69**
DG-AC13	4	0.5-1	DG-AC13S-0.5-1	1/24/2019	**1.2 U**	**2.8**	**42**	<0.078	**0.31**	**20**	**5.5**	**87**	**150**	**0.094**	**4.4**	**150**	**0.64 J**	<0.12	<0.35 R	**180**	**81**
DG-AC13	4	3.5-4	DG-AC13S-3.5-4	1/24/2019	**1.5 U**	**1.4 J**	**44**	<0.10	**0.082 J**	**5.5**	**6**	**39**	**61**	**0.0089 J**	**0.63 J**	**150**	<0.46	<0.16	<0.45 R	**180**	**18**
DG-AC14	4	0.5-1	DG-AC14S-0.5-1	1/24/2019	**2.5**	**5.4**	**49**	<0.11	**1.3**	**27**	**3.9**	**130**	**310**	**0.21**	**3.7**	**21**	**1.1 J**	**0.83 U**	<0.48 R	**22**	**140**
DG-AC14	4	3.5-4	DG-AC14S-3.5-4	1/24/2019	**2.3**	**8.1**	**51**	<0.081	**0.57**	**27**	**9.0**	**160**	**370**	**0.19**	**1.2 J**	**110**	<0.38	<0.13	<0.36 R	**99**	**76**
DG-AD10	4	0.5-1	DG-AD10S-0.5-1	1/15/2019	**1.4 U**	**0.74 J**	**41**	**0.16 J**	**0.15 J**	**15**	**14**	**91**	**12**	**0.058**	**0.18 J**	**7.9**	<0.42	<0.14	<0.41	**99**	**77**
DG-AD10	4	3.5-4	DG-AD10S-3.5-4	1/15/2019	**1.9 U**	**1.6 J**	**44**	<0.12	**0.20 J**	**17**	**13**	**130**	**28**	**0.12**	<0.24	**8.9**	<0.57	<0.19	<0.55	**85**	**130**
DG-AD11	4	0.5-1	DG-AD11S-0.5-1	1/31/2019	<0.33 U	**0.73 J**	**18**	<0.13 U	<0.050 U	**12**	**13**	**79**	**2.0 U**	**0.076**	<0.26 U	**8.2**	**0.85 J**	**0.20 J**	**1.1 J**	**100**	**46**
DG-AD11	4	3.5-4	DG-AD11S-3.5-4	1/31/2019	**1.5**	**3.1**	**30**	<0.096 U	**0.37**	**9.0**	**2.0**	**41**	**170**	**0.049**	**0.44 J**	**8.0**	**0.75 J**	<0.15 U	<0.43 U	**9.4**	**94**
DG-AD12	4	0.5-1	DG-AD12S-0.5-1	1/31/2019	**2.0**	**6.0 J**	**41 J**	<0.11 U	**0.14 J**	**42**	**8.4**	**150**	**290**	**0.13**	**1.1 J**	**100**	**0.91 J**	**0.16 J**	<0.47 U	**100 J**	**84**
DG-AD12	4	3.5-4	DG-AD12S-3.5-4	1/31/2019	**5.3**	**10**	**32**	**0.12 J**	**0.15 J**	**23**	**5.2**	**150**	**1,000**	**0.097**	**0.27 J**	**12**	**0.52 J**	<0.15 U	<0.43 U	**28**	**120**
DG-AD12 (D)	4	0.5-1	DG-AD12 (D)S-0.5-1	1/31/2019	**2.6**	**13 J**	**71 J**	<0.11 U	**0.19 J**	**33**	**8.9**	**240**	**290**	**0.21**	**2.3 J**	**150**	**3.3 U**	**0.82 U**	<0.48 U	**170 J**	**91**
DG-AD13	4	0.5-1	DG-AD13S-0.5-1	2/1/2019	**1.2 J**	**2.6 J**	**59**	<0.092	**0.17 J**	**19**	**5.4**	**110**	**160**	**0.16**	**1.2 J**	**130**	**2.8 U**	**0.71 U**	<0.41	**120**	**74**
DG-AD13	4	3.5-4	DG-AD13S-3.5-4	2/1/2019	**1.5**	**9.7**	**86**	<0.091	**0.077 J**	**16**	**9**	**130**	**190**	**0.5**	**2.5**	**260**	**2.8 U**	**0.72**	<0.41	**290**	**81**
DG-AD13	4	7.5-8	DG-AD13S-7.5-8	2/1/2019	**14**	**13 J**	**190 J**	<0.11 UJ	**0.84 J**	**21 J**	**6.3 J**	**200**	**1,000**	**0.084**	**1.1 J**	**140**	**3.3 UJ**	**0.81 UJ**	<0.47	**140 J**	**510 J**
DG-AD13 (D)	4	7.5-8	DG-AD13 (D)S-7.5-8	2/1/2019	**13**	**43 J**	**350 J**	**0.18 J**	**1.5 J**	**37 J**	**11 J**	**220**	**1,200**	**0.21**	**0.74 J**	**84**	**4.1 J**	**1.2 J**	<0.46	**35 J**	**1,000 J**
DG-AE10	4	0.5-1	DG-AE10S-0.5-1	1/15/2019	<0.28	**0.65 J**	**11**	<0.11	**0.093 J**	**14**	**21**	**99**	**1.7**	**0.072**	**0.68 J**	**6.5**	**0.67 J**	<0.17	<0.49	**110**	**59**
DG-AE10	4	3.5-4	DG-AE10S-3.5-4	1/15/2019	<0.28 UJ	**0.89 J**	**19 J**	<0.11	<0.042	**8.3**	**6.3 J**	**76 J**	**1.7 U**	**0.1**	<0.22	**3.9**	<0.51	<0.17	**0.52 J**	**54 J**	**95 J+**
DG-AE11	4	0.5-1	DG-AE11S-0.5-1	1/21/2019	**0.50 J**	**2.6**	**24**	<0.068	**0.13 J**	**27**	**4.2**	**10**	**17**	**0.04**	**0.16 J**	**20**	<0.31	<0.11	<0.30	**26**	**32**
DG-AE11	4	3.5-4	DG-AE11S-3.5-4	1/21/2019	**1.6 U**	**2.8 J**	**31**	<0.10	**0.16 J**	**10**	**9.2**	**120**	**28**	**0.12**	<0.20	**9.1**	**3.1 U**	<0.16	<0.45	**95**	**41**
DG-AE12	4	0.5-1	DG-AE12S-0.5-1	1/25/2019	**0.37 J**	**4.3**	**280**	**0.41**	**0.61**	**60**	**12**	**38**	**36**	**0.2**	**1.3 J**	**60**	<0.57	<0.19	<0.55	**70**	**66**
DG-AE12	4	3.5-4	DG-AE12S-3.5-4	1/25/2019	<0.31	**23**	**66**	**0.43**	**0.36 J**	**40**	**5.0**	**20**	**48**	**0.029**	<0.24	**33**	<0.56	<0.19	<0.54	**32**	**290**
DG-AE13	4	0.5-1	DG-AE13S-0.5-1	1/25/2019	**1.5 J**	**5.8**	**52**	**0.20 J**	**0.47 J**	**50**	**10**	**120**	**220**	**0.085**	**1.2 J**	**82**	**0.75 J**	<0.19	<0.55	**84**	**89**
DG-AE13	4	3.5-4	DG-AE13S-3.5-4	1/25/2019	**0.82 J**	**3.8**	**110**	**0.27 J**	**0.48**	**30**	**4.4**	**16**	**110**	**0.029**	<0.25	**24**	<0.58	<0.19	<0.56	**22**	**120**
DG-AF11	4	0.5-1	DG-AF11S-0.5-1	1/28/2019	**1.7 U**	**5.1**	**31**	<0.11 U	**0.15 J**	**31**	**5.7**	**15**	**26**	**0.065**	<0.22 U	**25**	<0.52 U	<0.17 U	<0.50 U	**31**	**36**
DG-AF11	4	3.5-4	DG-AF11S-3.5-4	1/28/2019	**3.4**	**8.2**	**42**	<0.11 U	**0.39 J**	**17**	**8.7**	**130**	**190**	**0.51**	**0.62 J**	**23**	**1.3 J**	<0.17 U	<0.49 U	**57**	**77**
DG-AF12	4	0.5-1	DG-AF12S-0.5-1	1/25/2019	**1.2**	**25**	**100**	**0.10 J**	**0.27 J**	**33**	**7.7**	**52**	**150**	**0.11**	**0.15 J**	**41**	<0.36	<0.12	<0.35	**41**	**110**
DG-AF12	4	3.5-4	DG-AF12S-3.5-4	1/25/2019	**1.7**	**36**	**83**	**0.096 J**	**0.28 J**	**14**	**2.5**	**94**	**280**	**0.061**	<0.16	**12**	<0.38	<0.13	<0.37	**14**	**150**
DG-AF13	4	0.5-1	DG-AF13S-0.5-1	11/21/2018	**0.79 J**	**19**	**80**	**0.14 J**	**0.073 J**	**48**	**8.2**	**16**	**31**	**0.097**	**0.25 J**	**24**	<0.52	**0.86 U**	<0.50	**43**	**36**
DG-AF13	4	0.5-1	DG-AF13S-0.5-1	1/28/2019	**2.0 U**	**5.6**	**120**	**0.39 U**	**0.26 J**	**40**	**7.9**	**40**	**120**	**0.058**	**0.28 J**	**40**	**0.60 J**	<0.20	**0.86 R**	**39**	**110**
DG-AF13	4	3.5-4	DG-AF13S-3.5-4	11/21/2018	**5.9**	**11**	**440**	**0.21 J**	**1.1**	**30**	**7.7**	**190**	**1,500**	**0.47**	**0.40 J**	**26**	<0.53	**1.9**	<0.51	**60**	**550**
DG-AF13	4	3.5-4	DG-AF13S-3.5-4	1/28/2019	**3.3**	**46**	**85**	<0.11	**0.54**	**29**	**4.8**	**110**	**360**	**0.19**	<0.22	**22**	<0.52	**0.57 J**	**0.53 R**	**21**	**370**
DG-AF13	4	7-7.5	DG-AF13S-7-7.5	11/21/2018	**4.5**	**10**	**400**	**0.56**	**0.69**	**28**	**9.7**	**120**	**890**	**0.15**	**0.45 J**	**29**	<0.56	**2.2**	<0.54	**30**	**460**
DG-AG11	4	0.5-1	DG-AG11S-0.5-1	1/21/2019	**1.0 J**	**26**	**68**	**0.089 J**	**0.51**	**25**	**5.8**	**70**	**190**	**0.1**	**0.42 J**	**21**	<0.38	**0.25 J**	<0.37	**39**	**130**
DG-AG11	4	3.5-4	DG-AG11S-3.5-4	1/21/2019	**3.1**	**87**	**79**	<0.12	**0.44 J**	**22**	**6.4**	**80**	**240**	**0.064**	<0.24	**25**	**0.96 J**	**0.52 J**	<0.54	**31**	**170**
DG-AG11	4	9.5-10	DG-AG11S-9.5-10	1/21/2019	**3.4**	**13**	**460**	**0.27 J**	**0.85**	**47**	**4.6**	**140**	**920**	**0.2**	<0.20	**37**	**0.76 J**	**1.7**	<0.45	**40**	**650**
DG-AG12	4	0.5-1	DG-AG12S-0.5-1	1/25/2019	**0.92 J**	**3.7 J+**	**34 J**	**0.34 J**	**0.37 J**	**16 J+**	**2.0 J**	**47 J+**	**320**	**0.063**	**0.83 J**	**6.5 J**	**0.94 J**	<0.18 U	<0.52	**29 J+**	**29 J+**
DG-AG12	4	3.5-4	DG-AG12S-3.5-4	1/25/2019	**19**	**16**	**1,100**	**0.6**	**2.7**	**45**	**7.9 J**	**3,600 J**	**2,600 J**	**0.67**	**0.98 J**	**410 J**	**1.8 J**	**4.0**	<0.57	**30**	**2,900 J**
DG-AG12 (D)	4	3.5-4	DG-AG12 (D)S-3.5-4	1/25/2019	**23**	**19**	**1,100**	**0.54**	**4.0**	**40**	**14 J**	**150 J**	**34 J**	**0.93**	<0.22 UJ	**2,100 J**	**1.3 J**	**6.6**	<0.49	**29**	**82 J**
DG-AG13	4	0.5-1	DG-AG13S-0.5-1	1/25/2019	<0.27	**5.0**	**34**	**0.22 J**	**0.34 J**	**9.3**	**2.6**	**43**	**150**	**0.04**	**0.46 J**	**23**	<0.49	<0.17	<0.48	**28**	**51**
DG-AG13	4	3.5-4	DG-AG13S-3.5-4	1/25/2019	**22**	**24**	**1,000**	**0.65**	**3.3**	**44**	**11**	**710**	**4,000**	**0.17**	**1.1 J**	**40**	**1.9 J**	**4.9**	<0.56	**49**	**2,200**
DG-AH11	4	0.5-1	DG-AH11S-0.5-1	1/28/2019	**1.7 U**	**6.9**	**46**	<0.11 U	**0.40 J**	**27**	**5.8**	**48**	**130**	**0.081**	**0.36 J**	**20**	<0.50 U	**0.36 J**	<0.49 U	**34**	**81**
DG-AH11	4	3.5-4	DG-AH11S-3.5-4	1/28/2019	**1.7 U**	**8.2**	**30**	<0.11 U	**0.44**	**16**	**6.6**	**100**	**140**	**0.16**	**0.49 J**	**14**	<0.52 U	<0.18 U	<0.50 U	**44**	**86**
DG-AH12	4	0.5-1	DG-AH12S-0.5-1	1/25/2019	**0.87 J**	**5.1**	**64**	**0.23 J**	**0.43 J**	**24**	**5.0**	**140**	**150**	**0.031**	<0.25	**28**	<0.59	<0.20	<0.57	**37**	**180**
DG-AH12	4	3.5-4	DG-AH12S-3.5-4	1/25/2019	**100**	**19**	**980**	**0.61**	**1.8**	**31**	**6.5**	**110**	**410**	**0.74**	**1.2 J**	**42**	**0.61 J**	**5.3**	<0.50	**36**	**1,600**
DG-AH13	4	0.5-1	DG-AH13S-0.5-1	1/29/2019	<0.26	**1.0 J**	**40**	<0.10	<0.039	**10**	**7.1**	**110**	**20**	**0.089**	<0.20	**6.5**	<0.48	<0.16	<0.46 R	**67**	**57**
DG-AH13	4	3.5-4	DG-AH13S-3.5-4	1/29/2019	**1.2 J**	**8.3**	**110**	**0.14 J**	**0.12 J**	**52**	**9.4**	**27**	**120**	**0.085**	**0.25 J**	**36**	**0.90 J**	<0.16	<0.46 R	**49**	**63**
DG-AH13	4	7.5-8	DG-AH13S-7.5-8	1/29/2019	**15**	**37**	**51**	**0.63 J**	**2.8**	**170**	**44**	**1,200**	**1,600**	**0.36**	**1.0 J**	**240**	<1.2	**1.7 J**	<1.1 R	**110**	**3,200**
DG-AI11	4	0.5-1	DG-AI11S-0.5-1	1/21/2019	<0.26	<0.27	**21**	<0.10	<0.039	**7.9**	**11**	**81**	**1.6 U**	**0.046**	<0.20	**6.9**	<0.48	<0.16	<0.46	**87**	**41**
DG-AI11	4	3.5-4	DG-AI11S-3.5-4	1/21/2019	**3.2 J**	**15 J+**	**250**	**0.19 J**	**0.8**	**18**	**7.1 J**	**160 J+**	**540**	**0.31**	**0.64 J**	**20**	**1.1 J**	**1.1**	<0.52	**60 J+**	**400**

Table 2: Metals Concentrations in Soil
Brisbane Baylands OU-2
Brisbane, California

Sample Location	Investigation Zone	Depth Range (ft bgs)	Sample Name	Collection Date	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
Direct Exposure Human Health Risk Level Residential Soil Exposure ESL [1]					1.1E+01	6.7E-02	1.5E+04	1.6E+01	7.8E+01	1.2E+05	2.3E+01	3.1E+03	8.0E+01	1.3E+01	3.9E+02	8.2E+02	3.9E+02	3.9E+02	7.8E-01	3.9E+02	2.3E+04
Regional Background [2]					5.5E+00	1.9E+01	3.2E+02	1.0E+00	2.7E+00	1.0E+02	2.5E+01	6.9E+01	1.6E+01	4.0E-01	7.4E+00	1.2E+02	5.6E+00	1.8E+00	7.6E+00	7.4E+01	1.1E+02
Units					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
DG-AI11	4	9.5-10	DG-AI11S-9.5-10	1/21/2019	**1.8 U**	**6.4**	**100**	**0.18 J**	**0.27 J**	**60**	**10**	**33**	**46**	**0.053**	**0.32 J**	**84**	<0.54	<0.18	<0.52	**41**	**67**
DG-AI11 (D)	4	0.5-1	DG-AI11 (D)S-0.5-1	1/21/2019	**1.6 U**	**0.99 J**	**29**	<0.10	**0.23 J**	**9.5**	**14**	**92**	**13 J**	**0.067**	<0.21	**7.5**	<0.48	<0.16	<0.47	**98**	**55**
DG-AI12	4	0.5-1	DG-AI12S-0.5-1	1/25/2019	**0.37 J**	**8.2**	**36**	**0.21 J**	**0.46 J**	**11**	**4.7**	**51**	**82**	**0.032**	<0.26	**11**	**0.87 J**	<0.20	<0.58	**38**	**75**
DG-AI12	4	3.5-4	DG-AI12S-3.5-4	1/25/2019	**0.35 J**	**4.1**	**18**	**0.20 J**	**0.074 J**	**10**	**2.5**	**13**	**9.1**	**0.013 J**	<0.25	**15**	<0.58	<0.19	<0.56	**18**	**25**
DG-AI13	4	0.5-1	DG-AI13S-0.5-1	2/1/2019	<0.29 R	**3.3 J**	**16**	<0.11	**0.28 J**	**6.8**	**12**	**83 J+**	**29**	**0.031**	<0.22	**7.5**	**1.4 J**	<0.17	**0.99**	**100 J+**	**74 J+**
DG-AI13	4	3.5-4	DG-AI13S-3.5-4	2/1/2019	<0.29	**33 J**	**31**	<0.11	**0.23 J**	**4.4 J**	**9.3**	**62 J**	**34**	**0.066 J**	<0.22	**10 J**	**0.73 J**	<0.18	<0.50	**62**	**83**
DG-AI13 (D)	4	3.5-4	DG-AI13 (D)S-3.5-4	2/1/2019	**1.8 U**	**73 J**	**31**	<0.11	**0.23 J**	**16 J**	**12**	**130 J**	**50**	**0.21 J**	<0.22	**20 J**	<0.53 UJ	<0.18	<0.51	**86**	**98**
DG-AJ11	4	0.5-1	DG-AJ11S-0.5-1	1/28/2019	**1.8 U**	**4.3**	**36**	<0.12 U	**0.21 J**	**31**	**6.2**	**14**	**27**	**0.043**	<0.23 U	**27**	**0.94 J**	<0.18 U	<0.51 U	**33**	**52**
DG-AJ11	4	3.5-4	DG-AJ11S-3.5-4	1/28/2019	**19**	**140**	**390**	<0.12 U	**1.9**	**76**	**12**	**350**	**1,700**	**0.57**	<0.23 U	**34**	**1.0 J**	**1.4**	<0.53 U	**54**	**810**
DG-AJ12	4	0.5-1	DG-AJ12S-0.5-1	1/25/2019	**37 J**	**16**	**65**	**0.73**	**0.35 J**	**36 J**	**13**	**190**	**1,200 J**	**0.35**	**0.63 J**	**44**	**0.89 J**	<0.19	<0.56	**48**	**150**
DG-AJ12	4	3.5-4	DG-AJ12S-3.5-4	1/25/2019	**2.3**	**14**	**360**	**0.94**	**0.59**	**47**	**17**	**150**	**280**	**0.13**	**0.42 J**	**66**	**0.94 J**	**0.35 J**	<0.57	**49**	**690**
DG-AJ12 (D)	4	0.5-1	DG-AJ12 (D)S-0.5-1	1/25/2019	**14 J**	**17**	**51**	**0.56**	**0.60 J**	**66 J**	**16**	**250**	**2,600 J**	**0.31**	**4.7 J**	**65**	**0.53 J**	<0.14	<0.41 UJ	**40**	**140**
DG-AJ13	4	0.5-1	DG-AJ13S-0.5-1	1/29/2019	**0.50 J**	**190**	**44 J**	<0.12	**0.21 J**	**10 J**	**11 J**	**81 J+**	**83 J-**	**0.046**	<0.24	**15**	**0.70 J**	**0.63 J**	<0.54	**68 J**	**70 J+**
DG-AJ13	4	3.5-4	DG-AJ13S-3.5-4	1/29/2019	**0.38 J**	**33**	**150**	**0.14 J**	**0.36 J**	**8.4**	**10**	**220**	**52**	**0.047**	<0.22	**10**	<0.53	**0.35 J**	<0.51 R	**77**	**380**
DG-AK11	4	0.5-1	DG-AK11S-0.5-1	1/22/2019	**0.22 J**	<0.22	**15**	<0.083	**0.13 J**	**84**	**12**	**74**	**2.3**	**0.049**	<0.16	**7.6**	<0.38	<0.13	<0.37	**84**	**47**
DG-AK11	4	3.5-4	DG-AK11S-3.5-4	1/22/2019	**15**	**31**	**490**	<0.28	**7.3**	**47**	**10**	**580**	**1,800**	**0.25**	**1.3 J**	**53**	<1.3	**0.99 J**	<1.3	**44**	**1,300**
DG-AK12	4	0.5-1	DG-AK12S-0.5-1	1/25/2019	**0.62 J**	**11**	**48**	**0.12 J**	**0.41**	**21**	**4.9**	**39**	**100**	**0.061**	<0.20	**19**	<0.46	<0.15	<0.44	**36**	**88**
DG-AK12	4	3.5-4	DG-AK12S-3.5-4	1/25/2019	**14**	**10**	**440**	**0.69**	**0.89**	**61**	**13**	**140**	**960**	**0.72**	<0.25	**61**	<0.58	**0.59 J**	<0.56	**51**	**520**
DG-AK13	4	0.5-1	DG-AK13S-0.5-1	1/25/2019	**2.8**	**40**	**100**	**0.28 J**	**0.8**	**27**	**11**	**200**	**300**	**0.17**	<0.21	**23**	**0.92 J**	**2.3**	<0.47	**87**	**300**
DG-AK13	4	3.5-4	DG-AK13S-3.5-4	1/25/2019	**4.3**	**290**	**420**	**0.4**	**0.76 J**	**14**	**12**	**140**	**200**	**1.7**	**1.1 J**	**14**	<1.1	**0.66 J**	<1.1	**87**	**210**
DG-AL11	4	0.5-1	DG-AL11S-0.5-1	1/28/2019	**1.8 U**	**4.4**	**49**	<0.12 U	**0.23 J**	**33**	**6.1**	**17**	**36**	**0.046**	<0.23 U	**27**	<0.54 U	<0.18 U	<0.52 U	**31**	**61**
DG-AL11	4	3.5-4	DG-AL11S-3.5-4	1/28/2019	**2.0 U**	**4.0 U**	**18**	<0.13 U	**0.18 J**	**7.8**	**14**	**83**	**3.1**	**0.059**	<0.25 U	**5.0**	**0.85 J**	<0.20 U	<0.57 U	**93**	**54**
DG-AL12	4	0.5-1	DG-AL12S-0.5-1	1/25/2019	**0.60 J**	**8.8**	**57**	<0.12	**0.48**	**20**	**3.5**	**31**	**150**	**0.04**	<0.23	**22**	<0.54	<0.18	<0.52	**23**	**110**
DG-AL12	4	3.5-4	DG-AL12S-3.5-4	1/25/2019	**10**	**13**	**730**	**0.51**	**1.4**	**31**	**6.4**	**580**	**2,000**	**1.1**	**0.82 J**	**37**	<0.36	**1.6**	<0.35	**60**	**990**
DG-AL13	4	0.5-1	DG-AL13S-0.5-1	1/29/2019	**0.93 J**	**7.5**	**38**	**0.12 J**	**0.29**	**14**	**15**	**120**	**52**	**0.046**	**0.28 J**	**18**	**0.98 J**	<0.12	<0.34 R	**91**	**110**
DG-AL13	4	3.5-4	DG-AL13S-3.5-4	1/29/2019	<0.23	**0.86 J**	**26**	**0.15 J**	<0.034	**7.9**	**8.8**	**89**	**4.8**	**0.043**	<0.18	**3.8**	<0.41	<0.14	<0.40 R	**78**	**35**
DG-AM11	4	0.5-1	DG-AM11S-0.5-1	1/22/2019	<0.29	<0.30	**15**	**0.20 J**	**0.082 J**	**8.4**	**13**	**76**	**1.9**	**0.044**	**0.36 J**	**5.5**	**1.5 J**	<0.18	**1.7 J**	**96**	**46**
DG-AM11	4	3.5-4	DG-AM11S-3.5-4	1/22/2019	**12**	**12**	**300**	**0.45 J**	**1.4**	**47**	**9.0**	**1500**	**700**	**0.13**	<0.33	**32**	**1.7 J**	**3.5**	<0.75	**37**	**1,300**
DG-AM12	4	0.5-1	DG-AM12S-0.5-1	1/25/2019	**1.3 J**	**5.3**	**32**	**0.12 J**	**0.23 J**	**13**	**2.8**	**22**	**64**	**0.033**	<0.18	**12**	<0.43	<0.14	<0.41	**15**	**57**
DG-AM12	4	3.5-4	DG-AM12S-3.5-4	1/25/2019	**2.2**	**12**	**170**	**0.55**	**0.42**	**53**	**12**	**81 J**	**110 J**	**0.11**	**0.16 J**	**39**	**0.54 J**	<0.12 UJ	<0.35	**50**	**400**
DG-AM12 (D)	4	3.5-4	DG-AM12 (D)S-3.5-4	1/25/2019	**2.8**	**12**	**250**	**0.47**	**0.6**	**58**	**13**	**160 J**	**320 J**	**0.08**	<0.23	**41**	**3.6 U**	**0.79 J**	<0.52	**47**	**590**
DG-AM13	4	0.5-1	DG-AM13S-0.5-1	1/31/2019	**10**	**35**	**130**	<0.090 U	**1.1**	**21**	**7.8**	**81 J**	**220**	**0.20 J**	**0.52 J**	**21**	<1.0 U	<0.35 U	<1.0 U	**33**	**250**
DG-AM13	4	3.5-4	DG-AM13S-3.5-4	1/31/2019	**6.2**	**17 J**	**370**	<0.29 U	**0.79 J**	**19 J**	**3.7 J**	**220**	**960**	**0.19**	<0.57 U	**18 J**	<1.3 U	**2.2 U**	<1.3 U	**20 J+**	**660**
DG-AM13 (D)	4	0.5-1	DG-AM13 (D)S-0.5-1	1/31/2019	**8.8**	**21**	**150**	<0.092 U	**0.69**	**17**	**5.9**	**160 J**	**290**	**0.11 J**	**0.20 J**	**19**	<0.43 U	**0.71 U**	<0.41 U	**35**	**270**
DG-AN11	4	0.5-1	DG-AN11S-0.5-1	1/28/2019	**2.0 U**	<0.34 U	**8.9**	<0.13 U	**0.15 J**	**8.7**	**15**	**99**	**2.5**	**0.06**	**0.32 J**	**5.2**	<0.59 U	<0.20 U	<0.57 U	**97**	**49**
DG-AN11	4	3.5-4	DG-AN11S-3.5-4	1/28/2019	**2.0 U**	**3.9 U**	**42**	<0.13 U	**0.069 J**	**8.1**	**11**	**93**	**7.9**	**0.11**	<0.25 U	**4.0**	<0.59 U	<0.20 U	<0.57 U	**97**	**43**
DG-AN12	4	0.5-1	DG-AN12S-0.5-1	1/25/2019	**0.64 J**	**9.5**	**22**	**0.10 J**	**0.24 J**	**11**	**2.4**	**18**	**59**	**0.036**	<0.15	**10**	<0.34	<0.12	<0.33	**13**	**50**
DG-AN12	4	3.5-4	DG-AN12S-3.5-4	1/25/2019	**2.5**	**140**	**120**	<0.099	**0.54**	**64**	**14**	**110**	**34**	**0.1**	<0.20	**13**	**2.2 J**	<0.15	**1.7**	**100**	**360**
DG-AN13	4	0.5-1	DG-AN13S-0.5-1	1/31/2019	**1.9 U**	**6**	**47**	**0.6**	**0.19 J**	**37**	**11**	**38**	**11**	**0.016 U**	<0.24	**54**	**3.8 U**	<0.19	<0.55 R	**59**	**45**
DG-AN13	4	3.5-4	DG-AN13S-3.5-4	1/31/2019	**1.6 U**	**0.39 J**	**250**	**0.77**	**0.28 J**	**41**	**21**	**81**	**5.4**	**0.14**	<0.21	**35**	**3.2 U**	**0.29 J**	<0.47 R	**120**	**69**
DG-AN13	4	9.5-10	DG-AN13S-9.5-10	1/31/2019	**18**	**28**	**500**	<0.63	**3.7**	**58**	**6.0**	**1,200**	**9,200**	**12**	**3.7 J**	**34**	<2.9	**4.7 J**	<2.8 R	**19**	**2,900**
DG-W10	4	0.5-1	DG-W10S-0.5-1	1/29/2019	**12 J**	**5.5 J**	**760 J**	<0.46	**4.4 J**	**54 J**	**35 J**	**700 J**	**1,300 J**	**0.26**	**1.2 J**	**30 J**	<2.1	**2.0 J**	<0.41	**280 J**	**980 J**
DG-W10	4	3.5-4	DG-W10S-3.5-4	1/29/2019	**77 J**	**25**	**1,000**	<0.26 UJ	**5.5**	**41 J**	**8.6**	**880 J**	**5,600 J**	**2.3**	**0.85 J**	**54**	**2.2 J**	**12**	<1.2 R	**22**	**2,800**
DG-W10 (D)	4	3.5-4	DG-W10 (D)S-3.5-4	1/29/2019	**30 J**	**17**	**1,300**	**0.38 J**	**7.2**	**77 J**	**8.8**	**510 J**	**3,100 J**	**1.9**	**1.1 J**	**51**	**6.1 J**	**13**	<1.3	**28**	**2,100**
DG-W11	4	0.5-1	DG-W11S-0.5-1	1/29/2019	**10**	**50**	**29**	<0.10	**0.21 J**	**11**	**5.0**	**91**	**360**	**0.091**	**0.60 J**	**20**	**0.55 J**	<0.16	<0.46 R	**29**	**60**
DG-W11	4	3.5-4	DG-W11S-3.5-4	1/29/2019	**0.32 J**	**100**	**42**	**0.11 J**	<0.033 UJ	**46**	**7.2**	**5.4**	**1.7 J**	<0.0023 UJ	<0.17	**37**	**0.53 J**	<0.13	<0.38 R	**35**	**19**
DG-W11 (D)	4	3.5-4	DG-W11 (D)S-3.5-4	1/29/2019	**2.6 J**	**89**	**38**	<0.11 UJ	**0.11 J**	**50**	**5.9**	**7.2**	**5.3 J**	**0.0049 J**	<0.21	**37**	**0.57 J**	<0.17	<0.48	**29**	**21**
DG-W12	4	0.5-1	DG-W12S-0.5-1	1/28/2019	**1.9 J**	**4.0 U**	**33**	<0.13 U	**0.12 J**	**23**	**6.3**	**94**	**87**	**0.044**	<0.26 U	**12**	<0.60 U	<0.20 U	<0.58 U	**58**	**38**
DG-W12	4	3.5-4	DG-W12S-3.5-4	1/28/2019	<0.29 U	**7.5**	**600**	**0.71**	**0.14 J**	**17**	**19**	**20**	**19**	**0.062**	<0.22 U	**38**	**3.5 U**	<0.18 U	<0.50 U	**27**	**63**
DG-W13	4	0.5-1	DG-W13S-0.5-1	11/21/2018	**1.4 J**	**1.4 J**	**30**	<0.12	**0.17 J**	**16**	**13**	**130**	**66**	**0.07**	<0.24	**12**	<0.57	**0.94 U**	<0.55	**120**	**75**
DG-W13	4	0.5-1	DG-W13S-0.5-1	1/31/2019	**2**	**8.6**	**74**	**0.37 U**	**0.34 J**	**19**	**9.4**	**110**	**140**	**0.11**	<0.24	**22**	<0.56	<0.19	<0.54 R	**73**	**96**
DG-W13	4	3.5-4	DG-W13S-3.5-4	11/21/2018	**2.1**	**7.6**	**63**	**0.36**	**0.13 J**	**36**	**16**	**67**	**17**	**0.066**	**0.32 J**	**31**	<0.55	**0.91 U**	<0.53	**41**	**66**
DG-W13	4	3.5-4	DG-W13S-3.5-4	1/31/2019	**1.4 U**	**2.1 J**	**110**	**0.59**	**0.21 J**	**99**	**16**	**27**	**5.5**	**0.83**	<0.18	**130**	<0.43	<0.15	<0.42 R	**64**	**52**

Table 2: Metals Concentrations in Soil
Brisbane Baylands OU-2
Brisbane, California

Sample Location	Investigation Zone	Depth Range (ft bgs)	Sample Name	Collection Date	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
Direct Exposure Human Health Risk Level Residential Soil Exposure ESL [1]					1.1E+01	6.7E-02	1.5E+04	1.6E+01	7.8E+01	1.2E+05	2.3E+01	3.1E+03	8.0E+01	1.3E+01	3.9E+02	8.2E+02	3.9E+02	3.9E+02	7.8E-01	3.9E+02	2.3E+04
Regional Background [2]					5.5E+00	1.9E+01	3.2E+02	1.0E+00	2.7E+00	1.0E+02	2.5E+01	6.9E+01	1.6E+01	4.0E-01	7.4E+00	1.2E+02	5.6E+00	1.8E+00	7.6E+00	7.4E+01	1.1E+02
Units					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
DG-W13	4	7.5-8	DG-W13S-7.5-8	1/31/2019	**1.9**	**8.7**	**63**	**0.8**	**0.27 J**	**51**	**15**	**45**	**21**	**0.63**	<0.20	**52**	**3.1 U**	<0.16	<0.45 R	**44**	**96**
DG-W14	4	0.5-1	DG-W14S-0.5-1	1/23/2019	<5.0	**7.6**	**95**	<0.25	**2.7**	**36**	**7.3**	**170**	**420**	**0.56**	**2.4**	**30**	<1.7	<0.88	<5.0	**34**	**490**
DG-W14	4	3.5-4	DG-W14S-3.5-4	1/23/2019	<5.0	**6.2**	**56**	**0.40 J**	<0.25	**31**	**11**	**99**	**58**	**0.022**	<1.0	**74**	<1.7	<0.89	<5.0	**75**	**50**
DG-W14	4	9.5-10	DG-W14S-9.5-10	1/23/2019	<5.0	**14**	**29**	**0.35 J**	**0.44 J**	**40**	**11**	**37**	**18**	**0.079**	**1.1 J**	**51**	<1.7	<0.89	<5.0	**41**	**69**
DG-W15	4	0.5-1	DG-W15S-0.5-1	1/28/2019	**1.7 J**	**1.9 J**	**83**	<0.12	**0.21 J**	**26**	**10**	**37**	**23 J**	**0.25 J**	<0.24	**28**	<0.57	<0.19	**22 R**	**57**	**58**
DG-W15	4	3.5-4	DG-W15S-3.5-4	1/28/2019	**1.9 UJ**	**3.9 J**	**57 J+**	**0.38 U**	**0.13 J**	**13 J**	**4.3 J**	**80 J**	**110 J+**	**0.047**	<0.24 U	**19 J**	<0.57 U	**0.20 J**	**0.93 R**	**30 J+**	**45 J**
DG-W15 (D)	4	0.5-1	DG-W15 (D)S-0.5-1	1/28/2019	**1.8 U**	**5.6 J**	**85**	**0.35 U**	**0.061 J**	**30**	**11**	**36**	**13 J**	**0.0083 J**	<0.22	**40**	<0.53	<0.18	<0.51 R	**58**	**53**
DG-W17	4	0.5-1	DG-W17S-0.5-1	1/24/2019	**2.9 J**	**9.9**	**280 J**	**0.38 J**	**1.1**	**33 J**	**10 J**	**130 J**	**190 J**	**1.8 J+**	**0.76 J**	**32 J**	**1.1 J**	**0.54 J**	<0.57 R	**40 J**	**230**
DG-W17	4	3.5-4	DG-W17S-3.5-4	1/24/2019	<0.26 UJ	**0.71 J**	**16**	**0.15 J**	**0.11 J**	**11**	**10 J**	**59 J**	**8.4 J**	**0.092 J**	<0.20	**14**	**0.48 J**	<0.16	<0.45 R	**68**	**41**
DG-W17 (D)	4	3.5-4	DG-W17 (D)S-3.5-4	1/24/2019	**1.1 J**	**0.52 J**	**17**	<0.096 UJ	**0.50 J**	**10**	**17 J**	**110 J**	**2.3 J**	**0.19 J**	<0.19	**12**	**0.47 J**	**0.15 J**	**1.4 R**	**96**	**52**
DG-W18	4	0.5-1	DG-W18S-0.5-1	1/24/2019	**1.0 J**	**4.8 J**	**65**	<0.11	**0.52**	**21**	**10**	**79 J**	**140 J**	**0.087 J**	**0.74 J**	**26**	<0.49	**0.21 J**	**1.0 R**	**64**	**88**
DG-W18	4	3.5-4	DG-W18S-3.5-4	1/24/2019	**0.85 J-**	**0.54 J**	**11**	<0.13	**0.43 J**	**14**	**17**	**120**	**4.4**	**0.025**	<0.25	**7**	<0.59	**0.23 J**	**1.6 R**	**110**	**55**
DG-W18 (D)	4	0.5-1	DG-W18 (D)S-0.5-1	1/24/2019	**0.73 J**	**2.9 J**	**64**	<0.11	**0.57**	**32**	**6.6**	**44 J**	**63 J**	**0.33 J**	**0.79 J**	**39**	<0.50	<0.17 UJ	**0.89 R**	**48**	**91**
DG-X10	4	0.5-1	DG-X10S-0.5-1	1/29/2019	**1.1 J**	<0.29	**24**	<0.11	**0.12 J**	**6.8**	**9.8**	**110**	**53**	**0.041**	<0.22	**2.9**	<0.51	<0.17	<0.50	**87**	**42**
DG-X10	4	3.5-4	DG-X10S-3.5-4	1/29/2019	**21**	**9.8**	**490**	**0.12 J**	**0.87**	**18**	**3.4**	**330**	**1,800**	**0.62**	**0.33 J**	**16**	<0.53	**1.9**	<0.51 R	**12**	**700**
DG-X11	4	0.5-1	DG-X11S-0.5-1	1/28/2019	**7.0 J**	**11**	**26 J**	<0.10 U	**0.11 J**	**12**	**7.7**	**130 J**	**130 J**	**0.051**	<0.20 U	**20**	<0.48 U	<0.16 U	<0.46 U	**52 J**	**37 J**
DG-X11	4	3.5-4	DG-X11S-3.5-4	1/28/2019	**1.8 U**	**11**	**39**	**0.36 U**	**0.12 J**	**53**	**6.4**	**6.7**	**2.6**	**0.011 J**	<0.23 U	**39**	<0.54 U	<0.18 U	<0.52 U	**42**	**21**
DG-X12	4	0.5-1	DG-X12S-0.5-1	1/28/2019	**0.99 J**	**6.6**	**80**	<0.13 U	**0.67**	**55**	**9.0**	**160**	**270**	**0.24**	**2.6**	**32**	**4.0 U**	<0.20 U	<0.57 U	**67**	**170**
DG-X12	4	3.5-4	DG-X12S-3.5-4	1/28/2019	**15**	**15**	**1,900**	**0.49**	**3.4**	**65**	**6.8**	**800**	**4,700**	**0.79**	**0.52 J**	**44**	<0.58 U	**6.6**	<0.56 U	**36**	**2,600**
DG-X13	4	0.5-1	DG-X13S-0.5-1	1/22/2019	**7.0 J-**	**6.6**	**230 J**	<0.19	**2.3**	**35 J**	**10 J**	**240 J**	**950 J**	**0.33**	**1.2 J**	**34 J**	**1.8 J**	**1.4 J**	<0.85	**65 J**	**530 J**
DG-X13	4	3.5-4	DG-X13S-3.5-4	1/22/2019	**1.2 J**	**3.7 J**	**55**	**0.40 J**	**0.14 J**	**24 J**	**13**	**60 J**	**7.8 J**	**0.038 J**	**0.30 J**	**22**	<0.44 UJ	<0.15	**0.77 J**	**65 J**	**37 J**
DG-X13 (D)	4	3.5-4	DG-X13 (D)S-3.5-4	1/22/2019	**4.6 J**	**9.8 J**	**88**	<0.11 UJ	**0.32 J**	**12 J**	**14**	**150 J**	**970 J**	**0.077 J**	<0.22 UJ	**33**	**0.94 J**	<0.18	**0.52 J**	**110 J**	**200 J**
DG-X16	4	0.5-1	DG-X16S-0.5-1	1/23/2019	<5.0	**4.3**	**39**	<0.25	**0.36 J**	**35**	**9.1**	**140**	**110**	**0.12**	**1.2 J**	**26**	<1.7	<0.89	<5.0	**75**	**76**
DG-X16	4	3.5-4	DG-X16S-3.5-4	1/23/2019	<4.9	**5.6**	**64**	**0.42 J**	<0.25	**52**	**9.5**	**71**	**100**	**2.2**	<0.99	**71**	<1.7	<0.88	<4.9	**60**	**49**
DG-X17	4	0.5-1	DG-X17S-0.5-1	1/28/2019	**1.3 U**	**4.3**	**95**	**0.26 U**	**0.16 J**	**26**	**6.1**	**62**	**55**	**0.061**	**0.36 J**	**32**	**0.90 J**	<0.13	<0.38 R	**35**	**56**
DG-X17	4	3.5-4	DG-X17S-3.5-4	1/28/2019	**33**	**40**	**63**	<0.12	**13**	**53**	**12**	**730**	**17,000**	**0.073**	**1.7 J**	**59**	**4.0 J**	**5.3**	<1.4 R	**36**	**5,700**
DG-X18	4	0.5-1	DG-X18S-0.5-1	1/24/2019	**1.1 J**	**5.5**	**85**	<0.11	**0.47**	**86**	**14**	**29**	**51**	**0.075**	**0.38 J**	**120**	<0.51	**0.24 J**	**1.1 R**	**62**	**45**
DG-X18	4	3.5-4	DG-X18S-3.5-4	1/24/2019	**7.2**	**16**	**130**	<0.13	**2.2**	**74**	**16**	**320**	**2,000**	**0.26**	**6.5**	**79**	**5.6 J**	<0.49	<1.4 R	**53**	**360**
DG-X19	4	0.5-1	DG-X19S-0.5-1	2/5/2019	**0.68 J**	**11**	**310**	**0.83**	<0.038	**20**	**12**	**34**	**38**	**0.11**	**2.6**	**39**	**1.4 J**	<0.16	**1.0**	**21**	**64**
DG-X19	4	3.5-4	DG-X19S-3.5-4	2/5/2019	**12**	**70**	**520**	**0.12 J**	**0.21 J**	**41**	**13**	**260**	**2,900**	**0.14**	**1.2 J**	**50**	**5.6 J**	<0.37	**1.5**	**55**	**650**
DG-Y10	4	0.5-1	DG-Y10S-0.5-1	1/29/2019	**5.8**	**7.4**	**70**	<0.084	**2.5**	**20**	**9.8**	**140**	**250**	**0.18**	**1.1 J**	**12**	**1.3 J**	**0.28 J**	**0.45**	**63**	**310**
DG-Y10	4	3.5-4	DG-Y10S-3.5-4	1/29/2019	**1.3**	<0.20	**18**	<0.075	**0.21 J**	**7.6**	**7.9**	**83**	**20**	**0.037**	<0.15	**3.1**	**0.60 J**	<0.12	**0.46**	**68**	**57**
DG-Y11	4	0.5-1	DG-Y11S-0.5-1	1/21/2019	**5.3**	**14**	**94**	<0.11	**0.72**	**21**	**8.4**	**200**	**500**	**0.4**	**0.36 J**	**24**	<0.50	<0.17	<0.48	**58**	**210**
DG-Y11	4	3.5-4	DG-Y11S-3.5-4	1/21/2019	**2.4**	**11**	**360**	**0.79**	**0.29 J**	**26**	**15**	**220**	**610**	**0.097**	<0.16	**34**	<0.38	<0.13	<0.37	**33**	**140**
DG-Y12	4	0.5-1	DG-Y12S-0.5-1	1/25/2019	<0.26	**3.2 U**	**27**	<0.10	**0.20 J**	**5.1**	**0.60 J**	**9.3**	**120**	**0.0064 J**	<0.20	**3.9**	<0.48	<0.16	<0.46	**4.6**	**37**
DG-Y12	4	3.5-4	DG-Y12S-3.5-4	1/25/2019	**9.5**	**6.0**	**120**	<0.13	**0.67**	**23**	**12**	**270**	**340**	**0.21**	**0.28 J**	**19**	<0.60	**0.28 J**	<0.58	**80**	**340**
DG-Y13	4	0.5-1	DG-Y13S-0.5-1	1/31/2019	**1.8 J**	**4.1 J**	**69**	**0.45 J**	**0.41 J**	**42**	**5.6**	**34**	**120**	**0.047**	**0.25 J**	**25**	**2.8 U**	<0.14 UJ	<0.41 R	**35**	**140**
DG-Y13	4	3.5-4	DG-Y13S-3.5-4	1/31/2019	**8.5**	**15**	**800**	**0.42**	**2.2**	**29**	**7.4**	**510**	**2,700**	**8.3**	**0.42 J**	**23**	**7.1 U**	**2.3**	**1.6**	**31**	**1,900**
DG-Y13 (D)	4	0.5-1	DG-Y13 (D)S-0.5-1	1/31/2019	**1.8 UJ**	**3.3 J**	**58**	**0.36 UJ**	**0.36 J**	**37**	**5.9**	**27**	**91**	**0.063**	<0.23 UJ	**24**	<0.54	**0.21 J**	<0.52 R	**33**	**110**
DG-Y14	4	0.5-1	DG-Y14S-0.5-1	1/31/2019	**2.1**	**3.5 J**	**74**	**0.37 J**	**0.37 J**	**23**	**11**	**110**	**160**	**0.11**	**0.28 J**	**19 J**	<0.53	<0.18	<0.51 R	**72**	**120**
DG-Y14	4	3.5-4	DG-Y14S-3.5-4	1/31/2019	**1.9 UJ**	**3.3 J**	**89 J+**	**0.72**	**0.27 J**	**120 J**	**19 J**	**31**	**10**	**0.37 J**	<0.25	**130 J**	**3.8 U**	**0.27 J**	<0.56 R	**63 J**	**61**
DG-Y14 (D)	4	0.5-1	DG-Y14 (D)S-0.5-1	1/31/2019	**1.5**	**2.1 J**	**48**	**0.29 UJ**	**0.33 J**	**17**	**11**	**130**	**110**	**0.16**	<0.18 UJ	**11 J**	**2.9 U**	<0.14	<0.41 R	**90**	**88**
DG-Y15	4	0.5-1	DG-Y15S-0.5-1	1/31/2019	**2.5**	**6.8**	**60**	**0.11 J**	**0.96**	**56**	**6.9**	**73**	**200**	**0.12**	**0.79 J**	**19**	<0.44	<0.15	<0.43	**45**	**520**
DG-Y15	4	3.5-4	DG-Y15S-3.5-4	1/31/2019	**4.2**	**4.2**	**75**	**0.38**	**0.4**	**130**	**18**	**65**	**15**	**1.2**	**0.28 J**	**120**	**1.9 J**	<0.13	<0.38	**90**	**82**
DG-Y15	4	7.5-8	DG-Y15S-7.5-8	1/31/2019	**1.7**	**7.6**	**42**	**0.84**	**0.37**	**31**	**14**	**50**	**20**	**0.081**	**0.20 J**	**31**	**1.4 J**	<0.12	**0.37**	**36**	**87**
DG-Y15 (D)	4	3.5-4	DG-Y15 (D)S-3.5-4	1/31/2019	**5.2**	**4.2**	**51**	**0.47**	**0.51**	**150**	**19**	**75**	**23**	**0.73**	<0.21 UJ	**150**	**1.5 J**	<0.17	<0.48	**96**	**120**
DG-Y16	4	0.5-1	DG-Y16S-0.5-1	1/24/2019	**3.7 J**	**5.4**	**60**	**0.17 J**	**0.65**	**31**	**6.7**	**220 J**	**230**	**0.085**	**0.60 J**	**52**	**0.84 J**	<0.16	<0.47 R	**65**	**170**
DG-Y16	4	3.5-4	DG-Y16S-3.5-4	1/24/2019	**16**	**61**	**110**	**0.13 J**	**0.94**	**21**	**12**	**430**	**2,100**	**0.15**	**0.39 J**	**56**	<0.47	**0.79 U**	<0.46 R	**70**	**220**
DG-Y16 (D)	4	0.5-1	DG-Y16 (D)S-0.5-1	1/24/2019	**2.1 J**	**4.9**	**66**	<0.11 UJ	**0.61**	**26**	**7.6**	**110 J**	**200**	**0.096**	**0.91 J**	**48**	**0.64 J**	<0.18	<0.51 R	**64**	**160**
DG-Y17	4	0.5-1	DG-Y17S-0.5-1	1/23/2019	<5.0	**3.6**	**65**	<0.25	**2.1**	**14**	**8.4**	**180**	**170**	**0.065**	<1.0	**34**	<1.7	<0.89	<5.0	**80**	**510**
DG-Y17	4	3.5-4	DG-Y17S-3.5-4	1/23/2019	**9.9 U**	**11**	**88**	<0.25	**0.64**	**24**	**6.2**	**240**	**440**	**0.42**	**1.2 J**	**55**	<1.7	<0.88	<4.9	**57**	**100**
DG-Y18	4	0.5-1	DG-Y18S-0.5-1	1/23/2019	<5.0	**3.9**	**51**	<0.25	<0.25	**15**	**3.5**	**17**	**4.4**	<0.012	<1.0	**11**	<1.7	<0.89	<5.0	**32**	**29**
DG-Y18	4	3.5-4	DG-Y18S-3.5-4	1/23/2019	<5.0	**12**	**52**	<0.25	**1.9**	**21**	**11**	**140**	**310**	**0.099**	<1.0	**27**	<1.7	<0.89	<5.0	**83**	**290**

Table 2: Metals Concentrations in Soil
Brisbane Baylands OU-2
Brisbane, California

Sample Location	Investigation Zone	Depth Range (ft bgs)	Sample Name	Collection Date	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
Direct Exposure Human Health Risk Level Residential Soil Exposure ESL [1]					1.1E+01	6.7E-02	1.5E+04	1.6E+01	7.8E+01	1.2E+05	2.3E+01	3.1E+03	8.0E+01	1.3E+01	3.9E+02	8.2E+02	3.9E+02	3.9E+02	7.8E-01	3.9E+02	2.3E+04
Regional Background [2]					5.5E+00	1.9E+01	3.2E+02	1.0E+00	2.7E+00	1.0E+02	2.5E+01	6.9E+01	1.6E+01	4.0E-01	7.4E+00	1.2E+02	5.6E+00	1.8E+00	7.6E+00	7.4E+01	1.1E+02
Units					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
DG-Y19	4	0.5-1	DG-Y19S-0.5-1	1/28/2019	**1.0 J**	**3.3 J**	**65**	**0.22 J**	**0.22 J**	**48**	**8.8**	**23**	**18**	**0.031**	**0.27 J**	**73**	**0.91 J**	<0.19	**19 R**	**48**	**50**
DG-Y19	4	3.5-4	DG-Y19S-3.5-4	1/28/2019	**2.7**	**32**	**99**	**0.31 J**	**0.42 J**	**92**	**15**	**77**	**140**	**2.4**	<0.24	**91**	**1.0 J**	<0.19	**25 R**	**63**	**120**
DG-Y19	4	7.5-8	DG-Y19S-7.5-8	1/28/2019	**2.0**	**2.0 J**	**90**	<0.13	**0.12 J**	**57**	**10**	**10**	**2.7**	**0.042**	<0.26	**59**	<0.60	<0.20	**17 R**	**43**	**32**
DG-Z10	4	0.5-1	DG-Z10S-0.5-1	1/29/2019	**7.6**	**110**	**80**	<0.074	**2.3**	**410**	**8.5**	**160**	**250**	**0.16**	**1.1**	**12**	**1.1 J**	**0.17 J**	**0.57**	**61**	**430**
DG-Z10	4	3.5-4	DG-Z10S-3.5-4	1/29/2019	**60**	**24**	**1,400**	<0.29	**3.8**	**220**	**10**	**1,600**	**16,000**	**1.0**	**0.63 J**	**42**	**9.0**	**11**	<1.3	**29**	**2,700**
DG-Z11	4	0.5-1	DG-Z11S-0.5-1	1/28/2019	**2.3**	**18**	**41**	<0.11 U	**0.56**	**23**	**6.2**	**100**	**170**	**0.11**	**1.9**	**16**	<0.52 U	<0.18 U	<0.50 U	**44**	**88**
DG-Z11	4	3.5-4	DG-Z11S-3.5-4	1/28/2019	**9.5**	**76**	**120**	<0.12 U	**0.36 J**	**18**	**9**	**140**	**360**	**0.07**	<0.23 U	**28**	<0.54 U	<0.18 U	<0.52 U	**65**	**210**
DG-Z12	4	0.5-1	DG-Z12S-0.5-1	1/25/2019	**1.1 J**	**3.7 U**	**51**	<0.12	**0.49 J**	**14**	**13**	**100**	**140 J**	**0.078 J**	<0.24	**9.3**	**3.7 U**	<0.19	<0.54	**110**	**120**
DG-Z12	4	3.5-4	DG-Z12S-3.5-4	1/25/2019	**17**	**23**	**290**	<0.24	**2.0**	**40**	**14**	**330**	**960**	**0.52**	<0.47	**41**	**7.3 U**	**1.5 J**	<1.1	**31**	**640**
DG-Z12 (D)	4	0.5-1	DG-Z12 (D)S-0.5-1	1/25/2019	**0.68 J**	**3.2 U**	**42**	<0.10	**0.29 J**	**8.7**	**15**	**96**	**53 J**	**0.038 J**	<0.20	**5.7**	**3.2 U**	<0.16	<0.46	**120**	**73**
DG-Z13	4	0.5-1	DG-Z13S-0.5-1	1/28/2019	<0.30	**7.0**	**330**	**0.37 U**	**0.13 J**	**28**	**4.2**	**39**	**32**	**0.022 J**	**0.66 J**	**18**	<0.55	<0.19	<0.53 R	**67**	**65**
DG-Z13	4	3.5-4	DG-Z13S-3.5-4	1/28/2019	**5.9**	**14**	**350**	**0.88**	**0.33 J**	**55**	**16**	**160**	**550**	**0.22**	<0.25	**55**	<0.58	**0.41 J**	<0.56 R	**54**	**630**
DG-Z14	4	0.5-1	DG-Z14S-0.5-1	1/24/2019	**2.2**	**7.7**	**54**	<0.13	**1.1**	**29**	**6.0**	**120**	**670**	**0.95**	**5.8**	**25**	<0.59	**0.36 J**	<0.57 R	**56**	**99**
DG-Z14	4	3.5-4	DG-Z14S-3.5-4	1/24/2019	<0.24	**1.3 J**	**53**	<0.093	**0.37**	**12**	**8.6**	**98**	**1.8**	**0.023**	<0.18	**9.7**	<0.43	<0.14	**0.83 R**	**77**	**36**
DG-Z15	4	0.5-1	DG-Z15S-0.5-1	1/24/2019	**2.9**	**2.7 J**	**39**	<0.10	**0.45**	**36**	**10**	**110**	**180**	**0.044**	**0.36 J**	**16**	<0.47	<0.16	<0.45 R	**76**	**55**
DG-Z15	4	3.5-4	DG-Z15S-3.5-4	1/24/2019	**3.4**	**1.0 J**	**330**	<0.092	**0.6**	**49**	**21**	**43**	**5.4**	**0.11**	<0.18	**25**	**0.43 J**	<0.14	<0.41 R	**160**	**58**
DG-Z16	4	0.5-1	DG-Z16S-0.5-1	1/24/2019	**4.9 J**	**3.6**	**39 J**	**0.23 J**	**0.79**	**49 J+**	**6.1 J**	**160**	**800 J**	**0.27**	**0.88 J**	**43 J**	**1.5 J**	<0.15	<0.43 R	**67 J+**	**120 J+**
DG-Z16	4	3.5-4	DG-Z16S-3.5-4	1/24/2019	**2.0**	**2.0 J**	**30**	<0.073	**0.42**	**35**	**7.0**	**76**	**86**	**0.07**	**0.27 J**	**23**	**0.45 J**	<0.11	**0.39 R**	**60**	**74**
DG-Z16 (D)	4	3.5-4	DG-Z16 (D)S-3.5-4	1/24/2019	**1.8**	**1.7 J**	**21**	<0.080	**0.38**	**28**	**7.1**	**79**	**67**	**0.073**	**0.27 J**	**20**	**1.2 J**	<0.12	<0.36 R	**64**	**68**
DG-Z17	4	0.5-1	DG-Z17S-0.5-1	1/28/2019	**2.6**	**6.7**	**84**	<0.093	**0.59**	**20**	**7.1**	**130 J**	**260**	**0.13**	**0.62 J**	**40**	**0.83 J**	<0.14	**17 R**	**43**	**140**
DG-Z17	4	3.5-4	DG-Z17S-3.5-4	1/28/2019	**6.1**	**12**	**93**	<0.12	**0.46**	**11**	**3.5**	**250**	**630**	**0.019**	**0.85 J**	**34**	**1.6 J**	<0.18	**15 R**	**38**	**73**
DG-Z17	4	7.5-8	DG-Z17S-7.5-8	1/28/2019	**1.8**	**5.1**	**45**	**0.35**	**0.24 J**	**33**	**12**	**35**	**15**	**0.041**	<0.18	**28**	**1.7 J**	<0.15	**16 R**	**42**	**62**
DG-Z17 (D)	4	0.5-1	DG-Z17 (D)S-0.5-1	1/28/2019	**3.6**	**10**	**66**	<0.11	**0.63**	**25**	**9.9**	**230 J**	**270**	**0.14**	**2.1 J**	**37**	**1.8 J**	**0.86 U**	**26 R**	**67**	**160**
DG-Z18	4	0.5-1	DG-Z18S-0.5-1	1/23/2019	<5.0	**4.6**	**130**	**0.48 J**	<0.25	**46**	**11**	**42**	**9.3**	**0.07**	<1.0	**62**	<1.7	<0.89	<5.0	**50**	**49**
DG-Z18	4	3.5-4	DG-Z18S-3.5-4	1/23/2019	**10 U**	**11**	**55**	**0.32 J**	**0.56**	**19**	**8.4**	**210**	**570**	**0.054**	<1.0	**46**	<1.7	<0.89	<5.0	**68**	**290**
DG-Z19	4	0.5-1	DG-Z19S-0.5-1	2/5/2019	<0.26	**2.9 J**	**77**	**0.16 J**	**0.12 J**	**29**	**7.3**	**30**	**14**	**0.062**	**0.27 J**	**25**	<0.46	<0.16	<0.45	**56**	**42**
DG-Z19	4	3.5-4	DG-Z19S-3.5-4	2/5/2019	**3.7**	**130**	**120**	**0.33**	<0.037	**110**	**17**	**30**	**12**	**10**	**0.25 J**	**150**	**2.0 J**	<0.15	<0.43	**60**	**89**
DG-AO11	5	0.5-1	DG-AO11S-0.5-1	1/22/2019	**0.64 J**	**18**	**62**	**0.19 J**	**0.33**	**36**	**10**	**60**	**71**	**0.12**	**0.32 J**	**63**	<0.35	<0.12	**0.60 J**	**51**	**97**
DG-AO11	5	3.5-4	DG-AO11S-3.5-4	1/22/2019	**24**	**150**	**350**	**0.52**	**0.35 J**	**28**	**18**	**310**	**1,700**	**0.12**	**0.98 J**	**49**	<1.1	**0.86 J**	<1.1	**30**	**430**
DG-AO12	5	0.5-1	DG-AO12S-0.5-1	1/31/2019	**45**	**36**	**1,400**	**0.49**	**5.7**	**88**	**11**	**1,400**	**4,800**	**0.65**	**1.6 J**	**73**	**5.8**	**8.0**	<0.56 U	**42**	**3,500**
DG-AO12	5	3.5-4	DG-AO12S-3.5-4	1/31/2019	**57**	**54**	**1,900**	**0.36 U**	**6.0**	**59**	**13**	**640**	**6,000**	**0.02**	**1.7 J**	**47**	<2.7 U	**5.1**	<2.6 U	**41**	**2,700**
DG-AP10	5	0.5-1	DG-AP10S-0.5-1	1/28/2019	**0.81 J**	**0.26 J**	**22**	<0.093 U	**0.20 J**	**10**	**13**	**78**	**13**	**0.067**	**1.1 J**	**4.8**	**1.1 J**	<0.14 U	**0.81 J**	**90**	**71**
DG-AP10	5	3.5-4	DG-AP10S-3.5-4	1/28/2019	**8.1**	**17**	**410**	**0.17 J**	**1.5**	**52**	**9**	**580**	**1,200**	**0.13**	<0.19 U	**95**	**3.1**	**2.0**	<0.44 U	**34**	**720**
DG-AP11	5	0.5-1	DG-AP11S-0.5-1	1/31/2019	**1.2 J**	**3.4**	**87 J**	<0.095 U	**0.27 J**	**45 J**	**10**	**100**	**120 J**	**0.069 J**	**0.80 J**	**66 J**	**0.82 J**	**0.30 J**	**0.63 J**	**60**	**110 J**
DG-AP11	5	3.5-4	DG-AP11S-3.5-4	1/31/2019	**60**	**33**	**1,600**	**1.0**	**7.3**	**43**	**10**	**920**	**7,700**	**0.36**	**2.5 J**	**32**	**7.5**	**7.2**	<1.0 U	**32**	**2,500**
DG-AP11 (D)	5	0.5-1	DG-AP11 (D)S-0.5-1	1/31/2019	**1.7 J**	**4**	**150 J**	<0.088 U	**0.80 J**	**26 J**	**8.9**	**150**	**240 J**	**0.15 J**	**1.2 J**	**18 J**	**2.7 U**	**0.68 U**	<0.39 U	**76**	**260 J**
DG-AQ10	5	0.5-1	DG-AQ10S-0.5-1	2/1/2019	**1.7 U**	**2.3 J**	**55**	<0.11	**1.2**	**33**	**16**	**140**	**140**	**0.13**	**0.58 J**	**13**	<0.52	**0.28 J**	**0.63**	**110**	**260**
DG-AQ10	5	3.5-4	DG-AQ10S-3.5-4	2/1/2019	**22**	**14**	**760**	**0.13 J**	**4.1**	**40**	**11**	**7,700**	**2,700**	**1.1**	**0.75 J**	**46**	**5.8**	**6.2**	<0.78 R	**40**	**2,700**
DG-AQ11	5	0.5-1	DG-AQ11S-0.5-1	1/30/2019	**1.5**	**2.2 J**	**92**	**0.37**	**0.13 J**	**16**	**9.6**	**150**	**230**	**0.17**	<0.17	**7.8**	<0.40	<0.13	<0.38	**82**	**190**
DG-AQ11	5	3.5-4	DG-AQ11S-3.5-4	1/30/2019	**41**	**21**	**1,400**	**0.65**	**2.4**	**88**	**25**	**740**	**3,900**	**0.49**	**2.2**	**150**	**9.9 U**	**8**	<1.4	**25**	**2,700**
DG-AR10	5	0.5-1	DG-AR10S-0.5-1	1/31/2019	**66**	**43**	**1,900**	**0.56 J**	**7.8**	**88**	**15**	**1,900**	**9,800**	**3**	**2.1 J**	**78**	**9.4 U**	**8.5**	**3.0 J**	**33**	**4,700**
DG-AR10	5	3.5-4	DG-AR10S-3.5-4	1/31/2019	**65**	**24**	**2,100**	**0.89**	**6.3**	**53**	**10**	**1,800**	**6,900**	**1.6**	**1.2 J**	**67**	**8.5 U**	**7.4**	**2.0 J**	**34**	**4,900**
DG-AR11	5	0.5-1	DG-AR11S-0.5-1	1/30/2019	**19**	**24**	**1,000**	**0.33**	**2.8**	**160**	**13**	**770**	**1,600**	**1.2**	**0.94 J**	**58**	**3.3 U**	**2.7**	**0.73 J**	**47**	**1,700**
DG-AR11	5	3.5-4	DG-AR11S-3.5-4	1/30/2019	**200**	**15**	**1,500**	<0.30 U	**7.7**	**2600**	**15**	**1500**	**4,000**	**2.8**	**1.5 J**	**88**	**9.3 U**	**5.8**	<1.3 U	**41**	**4,400**
DG-AS10	5	0.5-1	DG-AS10S-0.5-1	1/31/2019	**76**	**35**	**1,500**	**0.93 U**	**4.3**	**99**	**14**	**19,000**	**6,900**	**1.2**	**2.1 J**	**74**	**10**	**8.0**	<1.4 U	**46**	**3,400**
DG-AS10	5	3.5-4	DG-AS10S-3.5-4	1/31/2019	**23**	**22**	**920**	**0.36 U**	**3.8**	**89**	**12**	**680**	**2,700**	**0.98**	**1.3 J**	**77**	**4.8**	**3.4**	<0.52 U	**39**	**3,000**
DG-AS9	5	0.5-1	DG-AS9S-0.5-1	12/20/2018	<0.27	**4.5**	**22**	**0.13 J**	**0.071 J**	**83**	**5.2**	**17**	**14**	**0.0022 J**	**0.34 J**	**80**	<0.49	<0.17	<0.48	**7.6**	**12**
DG-AS9	5	3.5-4	DG-AS9S-3.5-4	12/20/2018	**1.2 J**	**6.3**	**110**	**0.26 J**	**0.99**	**26**	**11**	**180**	**130**	**0.18**	**1.3 J**	**21**	**0.46 J**	**0.19 J**	<0.44	**82**	**290**
DG-AT10	5	0.5-1	DG-AT10S-0.5-1	1/30/2019	**15**	**140**	**380**	**0.29 U**	**2.2**	**55**	**19**	**400**	**1,400**	**0.83**	**1.3 J**	**64**	<1.1 U	**1.0 J**	**1.2 J**	**55**	**720**
DG-AT10	5	3.5-4	DG-AT10S-3.5-4	1/30/2019	**82**	**31**	**2,100 J**	<0.30 U	**7.9**	**230**	**15 J**	**3,000**	**12,000**	**2.9 J**	**1.0 J**	**100 J**	**9.1 U**	**9.0**	**3.9 J**	**46**	**4,900**
DG-AT8	5	0.5-1	DG-AT8S-0.5-1	12/21/2018	**1.0 J**	**4.3**	**83**	**0.37 J**	<0.047	**18**	**10**	**130**	**39**	**0.12**	**0.89 J**	**24**	<0.57	<0.19	<0.55	**100**	**120**
DG-AT8	5	3.5-4	DG-AT8S-3.5-4	12/21/2018	**18**	**38**	**1,200**	**0.43**	**3.6**	**56**	**8.5**	**720**	**4,400**	**0.66**	**0.61 J**	**47**	<0.58	**5.9**	**0.64 J**	**25**	**2,500**
DG-AT9	5	0.5-1	DG-AT9S-0.5-1	1/30/2019	**29**	**9**	**380**	**0.12 J**	**1.7**	**26**	**9.5**	**380**	**1,100**	**0.49**	**0.44 J**	**22**	<0.38	**1.8**	<0.36	**49**	**800**

Table 2: Metals Concentrations in Soil
Brisbane Baylands OU-2
Brisbane, California

Sample Location	Investigation Zone	Depth Range (ft bgs)	Sample Name	Collection Date	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
Direct Exposure Human Health Risk Level Residential Soil Exposure ESL [1]					1.1E+01	6.7E-02	1.5E+04	1.6E+01	7.8E+01	1.2E+05	2.3E+01	3.1E+03	8.0E+01	1.3E+01	3.9E+02	8.2E+02	3.9E+02	3.9E+02	7.8E-01	3.9E+02	2.3E+04
Regional Background [2]					5.5E+00	1.9E+01	3.2E+02	1.0E+00	2.7E+00	1.0E+02	2.5E+01	6.9E+01	1.6E+01	4.0E-01	7.4E+00	1.2E+02	5.6E+00	1.8E+00	7.6E+00	7.4E+01	1.1E+02
Units					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
DG-AT9	5	3.5-4	DG-AT9S-3.5-4	1/30/2019	**210**	**41**	**1,600**	**0.42 J**	**8.0**	**69**	**24**	**1,200**	**5,300**	**0.34**	**1.0 J**	**89**	**9.2 J**	**8.3**	<1.8	**40**	**4,900**
DG-AU10	5	0.5-1	DG-AU10S-0.5-1	1/30/2019	**46 J**	**29 J**	**970 J**	**0.46**	**4.8 J**	**69 J**	**14 J**	**1,000 J**	**4,800 J**	**0.9**	**1.1 J**	**110 J**	**7.2 U**	**5.7 J**	**1.1 J**	**39 J**	**3,000 J**
DG-AU10	5	3.5-4	DG-AU10S-3.5-4	1/30/2019	**61**	**100**	**1,700**	**0.36 J**	**4.3**	**130**	**40**	**2,300**	**6,900**	**0.54**	**2.4 J**	**290**	**8.0 J**	**5.5**	**2.6 J**	**23**	**5,100**
DG-AU10 (D)	5	3.5-4	DG-AU10 (D)S-3.5-4	1/30/2019	**67**	**47**	**1,200 J**	<1.3 U	**4.8**	**160**	**41 J**	**2,700**	**8,500**	**0.34 J**	**1.2 J**	**310 J**	**39 U**	**7.2 J**	**9.5 J**	**31**	**4,700**
DG-AU8	5	0.5-1	DG-AU8S-0.5-1	12/21/2018	**79**	**48**	**2,000**	**1.2**	**10**	**100**	**16**	**1,700**	**7,900**	**1.9**	**5.9**	**99**	**7.3 J**	**17**	<1.4	**53**	**5,200**
DG-AU8	5	3.5-4	DG-AU8S-3.5-4	12/21/2018	**35**	**24**	**1,700**	**0.95**	**5.8**	**58**	**13**	**3,000**	**4,900**	**1**	**4.0 J**	**63**	**2.6 J**	**6.6**	<1.3	**32**	**3,400**
DG-AU9	5	0.5-1	DG-AU9S-0.5-1	1/30/2019	**20**	**19**	**190**	**0.17 J**	**20**	**43**	**6.6**	**3,700**	**3,500**	**2**	**1.6 J**	**57**	**1.9 J**	**3.8**	**0.74 J**	**22**	**4,200**
DG-AU9	5	3.5-4	DG-AU9S-3.5-4	1/30/2019	**140**	**37**	**360**	**0.51 J**	**7.8**	**110**	**14**	**2,100**	**9,200**	**2.6**	**1.9 J**	**130**	**7.9 J**	**34**	<2.2 U	**40**	**7,000**
DG-AV7	5	0.5-1	DG-AV7S-0.5-1	12/20/2018	<0.28	**140**	**81**	**0.34**	**0.12 J**	**11**	**15**	**160**	**10**	**0.16**	**0.51 J**	**5.2**	**1.1 J**	<0.17	<0.48	**130**	**58**
DG-AV7	5	3.5-4	DG-AV7S-3.5-4	12/20/2018	**72**	**73**	**1,900**	**0.69 J**	**19**	**85**	**12**	**9,900**	**6,000**	**2.1**	**4.7**	**150**	**10**	**11**	**18**	**42**	**10,000**
DG-AV7	5	7.5-8	DG-AV7S-7.5-8	12/20/2018	**94**	**36**	**1,300**	**0.64 J**	**5.6**	**52**	**12**	**12,000**	**4,300**	**0.72**	**5.1**	**120**	<1.3	**9.7**	**2.8 J**	**28**	**6,100**
DG-AV8	5	0.5-1	DG-AV8S-0.5-1	12/21/2018	**38**	**29**	**1,500**	**1.3**	**17**	**71**	**15**	**1,400**	**3,400**	**1.0**	**3.8**	**71**	**4.2 J**	**5.6**	<1.1	**45**	**6,500**
DG-AV8	5	3.5-4	DG-AV8S-3.5-4	12/21/2018	**50 J**	**19**	**990 J**	**0.87 J**	**5.7**	**47 J**	**7.4**	**1,600 J**	**5,800 J**	**1.3**	**3.3 J**	**40 J**	**3.9 J**	**6.8**	<1.4	**28 J+**	**5,500 J**
DG-AV8 (D)	5	0.5-1	DG-AV8 (D)S-0.5-1	12/21/2018	**25 J**	**26**	**1,400 J**	**0.65 J**	**5.4 J**	**64**	**11**	**1,100 J**	**3,400 J**	**0.94 J**	**4.3**	**60**	<1.3	**5.6 J**	<1.2	**39**	**2,900 J**
DG-AV9	5	0.5-1	DG-AV9S-0.5-1	2/1/2019	**35**	**61**	**1,200**	**0.32 J**	**8.8**	**85**	**19**	**900**	**3,000**	**1**	**7.6**	**83**	**8.8 U**	**3.6**	<1.3 R	**28**	**3,400**
DG-AV9	5	3.5-4	DG-AV9S-3.5-4	2/1/2019	**68**	**26**	**190**	**0.46 J**	**3.6**	**50**	**15**	**1,300**	**4,700**	**1.4**	**2.5 J**	**48**	**7.2 U**	**6.0**	<1.1	**29**	**2,800**
DG-AV9	5	8.5-9	DG-AV9S-8.5-9	2/1/2019	**26**	**21**	**970**	**0.45 J**	**5.8**	**37**	**8.4**	**1,500**	**4,100**	**1.2**	**0.96 J**	**46**	**5.7 U**	**5.2**	**1.4 R**	**20**	**3,100**
DG-AW6	5	0.5-1	DG-AW6S-0.5-1	12/21/2018	**2.0 J-**	**4.7 J+**	**98 J**	**0.57**	**0.73**	**27 J**	**7.7 J**	**77 J+**	**140 J**	**0.098**	**1.2 J**	**30 J**	**0.47 J**	<0.14	<0.41	**34 J**	**220 J**
DG-AW6	5	3.5-4	DG-AW6S-3.5-4	12/21/2018	**39**	**23**	**1,700**	<0.57 UJ	**5.0**	**61**	**10**	**4,300 J**	**5,700**	**0.54**	**2.6 J**	**54**	<2.6	**11**	<2.5	**31**	**3,100**
DG-AW6 (D)	5	3.5-4	DG-AW6 (D)S-3.5-4	12/21/2018	**33**	**22**	**1,200**	**0.92 J**	**4.5**	**50**	**9.4**	**7,500 J**	**4,300**	**0.55**	**2.8 J**	**56**	<1.3	**10**	<1.3	**37**	**3,000**
DG-AW7	5	0.5-1	DG-AW7S-0.5-1	11/21/2018	**35**	**35**	**1,500**	**0.53 J**	**5.0**	**150**	**15**	**4,700**	**4,900**	**1.4**	**0.59 J**	**130**	<1.2	**7.4**	**1.6 J**	**33**	**3,600**
DG-AW7	5	3.5-4	DG-AW7S-3.5-4	11/21/2018	**37 J-**	**22**	**2,300 J**	**1.1**	**8.3 J**	**75 J**	**10 J**	**2,000**	**7,900**	**0.62**	**1.4 J**	**66 J**	<1.5 UJ	**13**	<1.5	**42 J**	**5,400**
DG-AW8	5	0.5-1	DG-AW8S-0.5-1	1/30/2019	**17 J**	**24 J**	**69**	<0.44 U	**3.3 J**	**60 J**	**11 J**	**670 J**	**14,000 J**	**0.31 J**	**5.7 J**	**65 J**	**3.8 J**	**3.4 J**	<2.0 U	**30 J**	**2,200 J**
DG-AW8	5	3.5-4	DG-AW8S-3.5-4	1/30/2019	**15**	**14**	**330**	<0.36 U	**1.1 J**	**21**	**4.4**	**350**	**1,800**	**0.68**	<0.70 U	**18**	**3.5 J**	**3.2**	<1.6 U	**12**	**920**
DG-AW8 (D)	5	3.5-4	DG-AW8 (D)S-3.5-4	1/30/2019	**13 J**	**6.5 J**	**690**	**0.61 U**	**2.2 J**	**19 J**	**3.8 J**	**420 J**	**1,600 J**	**0.033**	**1.1 J**	**24 J**	**12 U**	**2.4 J**	**2.3 J**	**8.2 J**	**1,300 J**
DG-AW9	5	0.5-1	DG-AW9S-0.5-1	1/30/2019	**19**	**24 J**	**1,100 J**	**0.54 J**	**3.4 J**	**89 J**	**13**	**780 J**	**1,900 J**	**1.7 J**	<0.47 UJ	**64 J**	**1.9 J**	**6.3 J**	<1.1 U	**55**	**2,100 J**
DG-AW9	5	3.5-4	DG-AW9S-3.5-4	1/30/2019	**11 J**	**11 J**	**130 J+**	**1.1 J+**	**3.5**	**45 J**	**6.3**	**890**	**3,400 J**	<0.024 U	**1.2 J**	**36 J**	**8.4 U**	**4.0**	<1.2 U	**31 J**	**2,400**
DG-AW9 (D)	5	0.5-1	DG-AW9 (D)S-0.5-1	1/30/2019	**13**	**10 J**	**340 J**	**0.27 U**	**1.5 J**	**52 J**	**12**	**270 J**	**1,100 J**	**0.47 J**	**0.89 J**	**36 J**	**2.7 U**	**1.8 J**	<0.40 U	**60**	**920 J**
DG-AX6	5	0.5-1	DG-AX6S-0.5-1	2/1/2019	**1.3**	**1.6**	**1,000**	**0.47**	**0.045 J**	**1.7**	**0.58**	**48**	**130**	**0.2**	**0.81 J**	**1.7**	**0.55 J**	**0.34**	<1.9	**1.6**	**76**
DG-AX6	5	3.5-4	DG-AX6S-3.5-4	2/1/2019	**1.6 U**	**7.3**	**79**	**0.99**	**0.21 J**	**34**	**25**	**37**	**49**	**0.14**	<0.21	**45**	**1.3 J**	<0.17	<0.48	**52**	**89**
DG-AX7	5	0.5-1	DG-AX7S-0.5-1	1/30/2019	**26**	**24**	**890**	**1.2**	**3.2**	**81**	**16**	**790**	**1,900**	**0.83**	**1.5 J**	**73**	**3.8 J**	**4.9**	<1.4 U	**62**	**2,200**
DG-AX7	5	3.5-4	DG-AX7S-3.5-4	1/30/2019	**31**	**32**	**310**	<0.53 U	**8.0**	**55**	**12**	**1,400**	**4,100**	**1.3**	**1.0 J**	**52**	**8.1 J**	**3.8 J**	**2.9 J**	**31**	**3,700**
DG-AX8	5	0.5-1	DG-AX8S-0.5-1	1/30/2019	**10**	**40**	**880**	**0.49 J**	**3.8**	**66**	**9.6**	**430**	**2,100**	**0.31**	**2.6 J**	**44**	<1.9 U	**1.2 J**	<1.8 U	**36**	**2,100**
DG-AX8	5	3.5-4	DG-AX8S-3.5-4	1/30/2019	**21**	**19**	**3,800**	**0.3**	**2.8**	**36**	**4.5**	**250**	**18,000**	**3.9**	**0.56 J**	**21**	**0.71 J**	**2.7 J**	<0.39 U	**16**	**7,600**
DG-AX9	5	0.5-1	DG-AX9S-0.5-1	1/23/2019	<5.0	**7.3**	**120**	**0.61**	<0.25	**71**	**14**	**36**	**28**	**0.42**	<1.0	**80**	<1.7	<0.89	<5.0	**45**	**60**
DG-AX9	5	3.5-4	DG-AX9S-3.5-4	1/23/2019	<5.0	**3.5**	**76**	<0.25	<0.25	**29**	**7.0**	**21**	**50**	**0.071**	<1.0	**50**	<1.7	<0.89	<5.0	**36**	**55**
DG-AX9	5	9.5-10	DG-AX9S-9.5-10	1/23/2019	**16**	**24**	**320**	**0.85**	**2.6**	**87**	**8.1**	**440**	**2,200**	**2.6**	**1.0 J**	**47**	**2.2 J**	**1.7**	<5.0	**46**	**1,400**
DG-AY8	5	0.5-1	DG-AY8S-0.5-1	1/30/2019	**0.53 J**	**4.8**	**100**	**0.51**	**0.11 J**	**91**	**9.0**	**23 J**	**30**	**0.035 J**	**0.19 J**	**25**	**0.97 J**	<0.11 U	<0.32 U	**34**	**85**
DG-AY8	5	3.5-4	DG-AY8S-3.5-4	1/30/2019	**1.8**	**8.4**	**110**	**0.88**	<0.027 U	**34**	**14**	**38**	**17**	**0.042**	<0.14 U	**32**	<0.33 U	<0.11 U	<0.32 U	**40**	**78**
DG-AY8 (D)	5	0.5-1	DG-AY8 (D)S-0.5-1	1/30/2019	**0.59 J**	**6.7**	**120**	**0.73**	**0.099 J**	**61**	**9.6**	**47 J**	**39**	**0.062 J**	<0.13 UJ	**30**	<0.31 UJ	<0.10 U	<0.30 U	**53**	**110**
DG-AB16	6	0.5-1	DG-AB16S-0.5-1	2/1/2019	**3.2 J**	**7.7 U**	**63**	**0.28 J**	**0.41 J**	**13**	**4.7**	**100**	**260**	**0.11**	<0.49	**67**	<1.2	<0.39	<1.1 R	**69**	**85**
DG-AB16	6	3.5-4	DG-AB16S-3.5-4	2/1/2019	**9.6**	**11**	**54**	<0.22	**0.27 J**	**14**	**4.2**	**210**	**570**	**0.013 J**	<0.43	**57**	**1.0 J**	<0.34	<0.97 R	**63**	**110**
DG-AB17	6	0.5-1	DG-AB17S-0.5-1	1/24/2019	**5.5**	**4.0**	**150**	<0.11	**1.5**	**220**	**18**	**69**	**620**	**0.23**	**5.2**	**51**	**2.4 J**	**0.29 J**	<0.48	**81**	**780**
DG-AB17	6	3.5-4	DG-AB17S-3.5-4	1/24/2019	**2.4**	**6.9**	**180**	**0.22 J**	**0.79**	**21**	**7.7**	**150**	**330**	**0.38**	<0.20	**41**	**1.4 J**	**0.19 J**	<0.46	**40**	**370**
DG-AC15	6	0.5-1	DG-AC15S-0.5-1	1/31/2019	**1.8 J**	**6.9**	**77**	**0.9**	**0.33 J**	**47**	**11**	**32**	**19**	**0.053**	**0.41 J**	**37**	**1.4 J**	<0.19	<0.53	**61**	**83**
DG-AC15	6	3.5-4	DG-AC15S-3.5-4	1/31/2019	**2.5**	**85**	**59**	**0.29**	**1.2**	**57**	**8.9**	**39**	**150**	**0.13**	**0.25 J**	**27**	**1.0 J**	<0.12	<0.35	**43**	**260**
DG-AC15	6	7.5-8	DG-AC15S-7.5-8	1/31/2019	**120**	**50**	**720**	**0.44**	**17**	**65**	**8.9**	**1,900**	**6,400**	**2.6**	<0.17	**58**	<2.0	**17**	<1.9	**40**	**15,000**
DG-AC15 (D)	6	0.5-1	DG-AC15 (D)S-0.5-1	1/31/2019	**1.7 UJ**	**4.9**	**120**	**0.77**	**0.21 J**	**55**	**12**	**23**	**13**	**0.036**	<0.22 UJ	**41**	**3.4 U**	<0.17	<0.49 R	**58**	**55**
DG-AC17	6	0.5-1	DG-AC17S-0.5-1	1/23/2019	<5.0	**6.7**	**48**	**0.5**	<0.25	**27**	**9.2**	**18**	**6.5**	**0.041**	<1.0	**31**	<1.7	<0.89	<5.0	**41**	**39**
DG-AC17	6	3.5-4	DG-AC17S-3.5-4	1/23/2019	<5.0	**37**	**150**	**0.33 J**	<0.25	**39**	**11**	**37**	**46**	**0.079**	<1.0	**44**	<1.7	<0.89	<5.0	**36**	**78**
DG-AD14	6	0.5-1	DG-AD14S-0.5-1	2/1/2019	**1.3 J**	**6.6 U**	**61**	**0.40 J**	**0.65 J**	**23**	**6.7**	**320**	**360**	**0.29**	**2.2 J**	**160**	<0.99	**0.91 J**	<0.95 R	**220**	**130**
DG-AD14	6	3.5-4	DG-AD14S-3.5-4	2/1/2019	**2.8**	**8.9**	**29**	**0.45**	**0.32 J**	**29**	**13**	**260**	**240**	**0.22**	**5.2**	**190**	**2.4 J**	**0.75**	<0.41 R	**310**	**51**
DG-AD15	6	0.5-1	DG-AD15S-0.5-1	1/23/2019	<5.0	**12**	**53**	**0.5**	**0.30 J**	**36**	**13**	**50**	**28**	**0.022**	<1.0	**31**	<1.7	<0.89	<5.0	**45**	**93**

Table 2: Metals Concentrations in Soil
Brisbane Baylands OU-2
Brisbane, California

Sample Location	Investigation Zone	Depth Range (ft bgs)	Sample Name	Collection Date	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
Direct Exposure Human Health Risk Level Residential Soil Exposure ESL [1]					1.1E+01	6.7E-02	1.5E+04	1.6E+01	7.8E+01	1.2E+05	2.3E+01	3.1E+03	8.0E+01	1.3E+01	3.9E+02	8.2E+02	3.9E+02	3.9E+02	7.8E-01	3.9E+02	2.3E+04
Regional Background [2]					5.5E+00	1.9E+01	3.2E+02	1.0E+00	2.7E+00	1.0E+02	2.5E+01	6.9E+01	1.6E+01	4.0E-01	7.4E+00	1.2E+02	5.6E+00	1.8E+00	7.6E+00	7.4E+01	1.1E+02
Units					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
DG-AD15	6	3.5-4	DG-AD15S-3.5-4	1/23/2019	<5.0	**1.7 J**	**26**	<0.25	<0.25	**45**	**3.2**	**7.6**	**3.0**	**0.032**	<0.99	**17**	<1.7	<0.88	<5.0	**37**	**16**
DG-AD16	6	0.5-1	DG-AD16S-0.5-1	1/23/2019	<5.0 UJ	**210 J**	**130 J**	**0.36 J**	**0.44 J**	**25**	**8.0**	**150 J**	**39 J**	**0.064**	<1.0	**23**	<1.7	<0.89	<5.0	**28**	**210 J**
DG-AD16	6	3.5-4	DG-AD16S-3.5-4	1/23/2019	<5.0	**19**	**49**	<0.25	**0.37 J**	**11**	**8.1**	**92**	**120**	**0.13**	<1.0	**7.6**	<1.7	<0.89	<5.0	**59**	**180**
DG-AD16 (D)	6	0.5-1	DG-AD16 (D)S-0.5-1	1/23/2019	<5.0 UJ	**6.3 J**	**76 J**	**0.35 J**	**0.33 J**	**36**	**7.2**	**33 J**	**72 J**	**0.064**	<0.99	**30**	<1.7	<0.88	<5.0	**44**	**74 J**
DG-AD17	6	0.5-1	DG-AD17S-0.5-1	1/24/2019	**1.3**	**2.4**	**230**	**0.25**	**0.35**	**31**	**12**	**56**	**13**	**0.043**	<0.16	**27**	**1.4 J**	**0.33 J**	<0.35	**58**	**50**
DG-AD17	6	3.5-4	DG-AD17S-3.5-4	1/24/2019	**1.7 J**	**9.2**	**98 J**	**0.59**	**0.17 J**	**37 J**	**11 J**	**45 J+**	**16**	**0.15**	<0.20	**32 J**	**0.62 J**	<0.16	<0.45 R	**40 J**	**110 J**
DG-AD17	6	7-7.5	DG-AD17S-7-7.5	1/24/2019	**1.4**	**8.6**	**57**	**0.61**	**0.25 J**	**57**	**8.2**	**29**	**15**	**0.035**	**0.33 J**	**32**	**1.7 J**	<0.11	<0.33	**50**	**80**
DG-AE14	6	0.5-1	DG-AE14S-0.5-1	1/23/2019	<5.0	**4.4**	**110**	<0.25 UJ	**0.81 J**	**37**	**5.6 J**	**25 J**	**26 J**	**0.061 J**	<1.0	**42**	<1.7	<0.89	<5.0	**66**	**63**
DG-AE14	6	3.5-4	DG-AE14S-3.5-4	1/23/2019	<5.0	**35**	**130**	<0.25	**0.44 J**	**110**	**9.7**	**110**	**92**	**0.25**	<1.0	**31**	<1.7	<0.89	<5.0	**47**	**180**
DG-AE16	6	0.5-1	DG-AE16S-0.5-1	1/23/2019	<5.0 UJ	**5.3**	**100 J**	**0.33 J**	**0.44 J**	**29**	**5.8**	**38 J**	**120 J**	**0.28**	<1.0	**43**	<1.7	<0.89 UJ	<5.0	**23**	**170 J**
DG-AE16	6	3.5-4	DG-AE16S-3.5-4	1/23/2019	<5.0	**5.8**	**98**	**0.35 J**	**0.48 J**	**30**	**5.6**	**45**	**140**	**0.72**	<1.0	**35**	<1.7	<0.89	<5.0	**22**	**200**
DG-AE17	6	0.5-1	DG-AE17S-0.5-1	1/23/2019	<5.0 UJ	**7.6**	**39 J**	<0.25	**0.49 J**	**23**	**8.7**	**36**	**220 J**	**0.043**	<1.0	**26**	<1.7	<0.89	<5.0	**25**	**81 J+**
DG-AE17	6	3.5-4	DG-AE17S-3.5-4	1/23/2019	<5.0	<1.5	**32**	<0.25	<0.25	**8.8**	**7.7**	**79**	<1.0	**0.052**	<1.0	**4.0**	<1.7	<0.89	<5.0	**80**	**62**
DG-AE18	6	0.5-1	DG-AE18S-0.5-1	1/23/2019	<5.0	**7.4**	**81**	**0.45 J**	<0.25	**44**	**14**	**17**	**10**	**0.051**	<1.0	**32**	<1.7	<0.89	<5.0	**45**	**59**
DG-AE18	6	3.5-4	DG-AE18S-3.5-4	1/23/2019	<5.0	**15**	**190**	**0.56**	<0.25	**26**	**27**	**20**	**15**	**0.048**	<0.99	**24**	<1.7	<0.88	<5.0	**39**	**140**
DG-AF14	6	0.5-1	DG-AF14S-0.5-1	2/5/2019	<0.30	**1.2 J**	**58**	<0.12	<0.045	**21**	**7.0**	**40**	**83**	**0.057**	**0.30 J**	**23**	**0.97 J**	<0.18	<0.53	**46**	**54**
DG-AF14	6	3.5-4	DG-AF14S-3.5-4	2/5/2019	<0.30	**0.47 J**	**88**	<0.12	<0.044	**13**	**7.2**	**38**	**18**	**0.042**	**0.24 J**	**21**	<0.54	<0.18	**0.77**	**47**	**36**
DG-AF16	6	0.5-1	DG-AF16S-0.5-1	1/23/2019	<5.0 UJ	**2.8 J**	**300**	**0.39 J**	**0.25 J**	**20**	**8.8**	**54 J-**	**13**	**0.11 J-**	**3.4**	**33**	<1.7	<0.89	<5.0	**36**	**58 J-**
DG-AF16	6	3.5-4	DG-AF16S-3.5-4	1/23/2019	<5.0	**5.9**	**91**	**0.36 J**	<0.25	**52**	**12**	**17**	**7.6**	**0.025**	<1.0	**29**	<1.7	<0.89	<5.0	**44**	**42**
DG-AF16 (D)	6	3.5-4	DG-AF16 (D)S-3.5-4	1/23/2019	<5.0	**6.3**	**100**	**0.46 J**	<0.25	**46**	**14**	**20**	**9.4**	**0.02**	<1.0	**30**	<1.7	<0.89	<5.0	**46**	**48**
DG-AF18	6	0.5-1	DG-AF18S-0.5-1	1/23/2019	<5.0	**31**	**110**	**0.38 J**	**0.29 J**	**39**	**9.1**	**27**	**74**	**0.12**	<1.0	**28**	<1.7	<0.89	<5.0	**37**	**110**
DG-AF18	6	3.5-4	DG-AF18S-3.5-4	1/23/2019	<5.0 UJ	**18 J-**	**520**	**0.54**	**0.33 J**	**38**	**14**	**160 J-**	**12**	**0.51**	<1.0	**43**	<1.7	<0.89	<5.0	**40**	**65**
DG-AF18 (D)	6	0.5-1	DG-AF18 (D)S-0.5-1	1/23/2019	<5.0	**6.8**	**79**	**0.36 J**	<0.25 UJ	**55**	**9.9 J**	**14 J**	**7.4 J**	**0.016 J**	<1.0	**30**	<1.7	<0.89	<5.0	**49**	**57**
DG-AG14	6	0.5-1	DG-AG14S-0.5-1	2/5/2019	<0.22	**2.8**	**110**	**0.10 J**	**0.69**	**15**	**4.0**	**19**	**19**	**0.15**	**0.88 J**	**26**	<0.39	<0.13	**0.9**	**50**	**33**
DG-AG14	6	3.5-4	DG-AG14S-3.5-4	2/5/2019	**2.4 J**	**8.6 J**	**600 J**	**0.29 J**	<0.043	**32**	**21 J**	**50 J**	**22 J**	**0.073 J**	<0.22	**29**	**2.0 J**	<0.17	**1.6**	**130**	**91**
DG-AG14 (D)	6	3.5-4	DG-AG14 (D)S-3.5-4	2/5/2019	**1.3 J**	**26 J**	**120 J**	**0.24 J**	<0.045	**26**	**12 J**	**110 J**	**57 J**	**0.23 J**	<0.23	**21**	**1.2 J**	<0.18	**1.1**	**82**	**120**
DG-AG15	6	0.5-1	DG-AG15S-0.5-1	1/24/2019	**0.30 J**	**3.1**	**23**	**0.090 J**	**0.13 J**	**24**	**3.8**	**8.1**	**28**	**0.065**	<0.16	**20**	<0.38	<0.13	<0.36	**22**	**30**
DG-AG15	6	3.5-4	DG-AG15S-3.5-4	1/24/2019	**1.3 J**	**7**	**110**	**0.41**	**0.55**	**30**	**8.2**	**32**	**88**	**0.17**	**0.29 J**	**28**	<0.51	<0.17	<0.49	**40**	**150**
DG-AG15	6	8.5-9	DG-AG15S-8.5-9	1/24/2019	**1.4 J**	**5.1**	**73**	**0.24 J**	**1.2**	**31**	**8.8**	**28**	**70**	**0.024**	<0.25	**44**	**1.2 J**	**0.41 J**	<0.57	**28**	**250**
DG-AG16	6	0.5-1	DG-AG16S-0.5-1	1/22/2019	**2.1**	**6.5**	**110**	**0.89**	**0.35**	**37**	**15**	**32**	**18**	**0.065**	**0.20 J**	**35**	**2.2 J**	**0.17 J**	**1.2 J**	**54**	**58**
DG-AG16	6	3.5-4	DG-AG16S-3.5-4	1/22/2019	**1.1 J**	**6.6**	**56**	**0.29 U**	**0.22 J**	**38**	**8.2**	**16**	**20**	**0.18**	<0.18 U	**32**	**0.82 J**	<0.15 U	<0.42 U	**35**	**33**
DG-AG18	6	0.5-1	DG-AG18S-0.5-1	1/23/2019	<5.0	**7.1**	**120**	**0.47 J**	<0.25	**76**	**15**	**16**	**12**	**0.36**	<0.99	**49**	<1.7	<0.88	<5.0	**62**	**41**
DG-AG18	6	3.5-4	DG-AG18S-3.5-4	1/23/2019	<5.0	**4.7**	**93**	**0.35 J**	<0.25	**62**	**11**	**13**	**6.4**	**0.034**	<1.0	**44**	<1.7	<0.89	<5.0	**54**	**33**
DG-AH14	6	0.5-1	DG-AH14S-0.5-1	2/5/2019	**0.55 J**	**8.2**	**180**	**0.53**	<0.037	**25**	**12**	**39**	**23**	**0.16**	<0.19	**50**	**1.0 J**	<0.15	**0.96**	**26**	**92**
DG-AH14	6	3.5-4	DG-AH14S-3.5-4	2/5/2019	**0.95 J**	**2.3 J**	**36**	**0.19 J**	<0.030	**50**	**7.7**	**5.7**	**6.3**	**0.036**	<0.15	**36**	**1.1 J**	<0.12	**0.45**	**42**	**24**
DG-AH15	6	0.5-1	DG-AH15S-0.5-1	1/22/2019	**1.8**	**8.6**	**170**	**0.78**	**0.44**	**37**	**13**	**38**	**62**	**0.28**	<0.20 U	**35**	**1.6 J**	<0.15 U	<0.44 U	**59**	**73**
DG-AH16	6	0.5-1	DG-AH16S-0.5-1	1/22/2019	**2.6**	**9.5**	**190**	**0.64**	**0.53**	**47**	**13**	**78**	**110**	**0.19**	<0.23 U	**43**	**2.3 J**	<0.18 U	<0.53 U	**56**	**130**
DG-AH16	6	3.5-4	DG-AH16S-3.5-4	1/22/2019	**1.8**	**5.8**	**70**	**0.66**	**0.20 J**	**37**	**7.5**	**26**	**32**	**0.075**	<0.14 U	**21**	**1.4 J**	<0.11 U	<0.32 U	**50**	**95**
DG-AH17	6	0.5-1	DG-AH17S-0.5-1	1/24/2019	**1.5 J**	**5.1**	**35**	**0.65**	**0.22 J**	**26**	**12**	**15**	**10**	**0.019**	<0.22	**25**	**1.1 J**	<0.18	<0.50	**34**	**75**
DG-AI14	6	0.5-1	DG-AI14S-0.5-1	2/1/2019	**0.77 J**	**3.7 U**	**56**	**0.22 J**	**0.36 J**	**26**	**8.1**	**160**	**67**	**0.083**	<0.24	**39**	<0.56	**0.26 J**	<0.54 R	**75**	**220**
DG-AI14	6	3.5-4	DG-AI14S-3.5-4	2/1/2019	<0.22	**5.1**	**14**	**0.11 J**	**0.065 J**	**8.9**	**2.7**	**13**	**19**	**0.0087 J**	<0.17	**18**	<0.40	**0.14 J**	<0.39 R	**20**	**20**
DG-AI15	6	0.5-1	DG-AI15S-0.5-1	1/24/2019	**1.2 J**	**9.2**	**69 J-**	**0.88**	**0.37 J**	**34**	**14**	**30 J**	**5.8**	**0.03**	**0.34 J**	**32**	**2.3 J**	**0.26 J**	<0.49	**50**	**50**
DG-AI15	6	3.5-4	DG-AI15S-3.5-4	1/24/2019	**1.6 J**	**8.3**	**93**	**0.28 J**	**0.33 J**	**34**	**5.0 J**	**20**	**8.1 J**	**0.042**	**0.40 J**	**26**	**1.8 J**	**0.21 J**	<0.57	**45**	**47**
DG-AI15 (D)	6	3.5-4	DG-AI15 (D)S-3.5-4	1/24/2019	**1.4 J**	**5.3**	**74**	**0.40 J**	**0.18 J**	**36**	**9.4 J**	**20**	**16 J**	**0.045**	**0.25 J**	**24**	**1.1 J**	<0.18 UJ	<0.50	**42**	**45**
DG-AI16	6	1-1.5	DG-AI16S-1-1.5	1/22/2019	**2.4**	**2.6 U**	**370**	**0.49**	**0.43**	**37**	**16**	**75**	**5.4**	**0.16**	<0.17 U	**31**	**1.8 J**	<0.13 U	<0.37 U	**82**	**57**
DG-AI17	6	0.5-1	DG-AI17S-0.5-1	1/22/2019	**3.1**	**15**	**92**	**1.0**	**0.72**	**48**	**18**	**49**	**25**	**0.029**	**0.26 J**	**47**	**2.3 J**	<0.17 U	<0.49 U	**59**	**180**
DG-AI17	6	3.5-4	DG-AI17S-3.5-4	1/22/2019	**2.4**	**9.1**	**26**	**0.94**	**0.94**	**36**	**19**	**59**	**230**	**0.19**	<0.22 U	**37**	**2.0 J**	<0.17 U	<0.50 U	**37**	**1,500**
DG-AJ14	6	0.5-1	DG-AJ14S-0.5-1	1/22/2019	**2.5**	**5.4**	**92**	**0.41**	**0.4**	**90**	**15**	**27**	**27**	**0.052**	<0.18 U	**100**	**0.82 J**	<0.15 U	**0.63 J**	**69**	**56**
DG-AJ14	6	3.5-4	DG-AJ14S-3.5-4	1/22/2019	**1.7**	**2**	**80**	**0.20 U**	**0.18 J**	**56**	**6.1**	**7.6**	**5.6**	**0.016 U**	<0.13 U	**20**	**0.98 J**	<0.10 U	<0.29 U	**54**	**25**
DG-AJ15	6	0.5-1	DG-AJ15S-0.5-1	1/22/2019	**3.3**	**3.4 U**	**160**	**0.4**	**0.46**	**41**	**22**	**48**	**6.3**	**0.057**	<0.22 U	**32**	**2.1 J**	<0.17 U	<0.50 U	**120**	**71**
DG-AJ15	6	3.5-4	DG-AJ15S-3.5-4	1/22/2019	**2.6**	**3.1 U**	**66**	**0.31 U**	**0.41**	**88**	**6.3**	**13**	**2.6**	**0.068**	<0.20 U	**31**	**1.1 J**	<0.16 U	<0.45 U	**64**	**50**
DG-AJ17	6	0.5-1	DG-AJ17S-0.5-1	1/24/2019	**1.7 J**	**8.3**	**30**	**0.52**	**0.20 J**	**38**	**7.5**	**19**	**12**	**0.016**	<0.25	**30**	**0.86 J**	<0.19	<0.56	**45**	**71**
DG-AJ17	6	3.5-4	DG-AJ17S-3.5-4	1/24/2019	**2.0**	**7.6**	**54**	**0.43**	**0.26 J**	**49**	**9.2**	**18**	**6.9**	**0.018**	**0.22 J**	**30**	**1.5 J**	<0.15	<0.44	**52**	**60**

Table 2: Metals Concentrations in Soil
Brisbane Baylands OU-2
Brisbane, California

Sample Location	Investigation Zone	Depth Range (ft bgs)	Sample Name	Collection Date	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
Direct Exposure Human Health Risk Level Residential Soil Exposure ESL [1]					1.1E+01	6.7E-02	1.5E+04	1.6E+01	7.8E+01	1.2E+05	2.3E+01	3.1E+03	8.0E+01	1.3E+01	3.9E+02	8.2E+02	3.9E+02	3.9E+02	7.8E-01	3.9E+02	2.3E+04
Regional Background [2]					5.5E+00	1.9E+01	3.2E+02	1.0E+00	2.7E+00	1.0E+02	2.5E+01	6.9E+01	1.6E+01	4.0E-01	7.4E+00	1.2E+02	5.6E+00	1.8E+00	7.6E+00	7.4E+01	1.1E+02
Units					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
DG-AJ17	6	9.5-10	DG-AJ17S-9.5-10	1/24/2019	**1.3 J**	**5.1**	**90**	**0.41**	**0.22 J**	**67**	**9.0**	**16**	**5.5**	**0.013 J**	<0.18	**32**	**1.1 J**	<0.14	<0.41	**48**	**52**
DG-AK14	6	0.5-1	DG-AK14S-0.5-1	1/22/2019	**3.7**	**19**	**130**	<0.090 U	**1.0**	**390**	**8.8**	**130**	**230**	**0.29**	<0.18 U	**27**	<0.41 U	**0.69 U**	<0.40 U	**59**	**330**
DG-AK14	6	3.5-4	DG-AK14S-3.5-4	1/22/2019	**0.91 J**	**1.7 J**	**110**	<0.12 U	**0.24 J**	**42**	**22**	**42**	**11**	**0.051**	<0.24 U	**35**	**3.7 U**	**0.93 U**	<0.54 U	**120**	**65**
DG-AK14 (D)	6	3.5-4	DG-AK14 (D)S-3.5-4	1/22/2019	**4.1**	**17**	**99**	**0.85**	**0.86**	**180**	**14**	**94**	**76**	**0.47**	**0.40 J**	**33**	**2.4 J**	<0.16 U	**0.75 J**	**63**	**210**
DG-AK15	6	0.5-1	DG-AK15S-0.5-1	1/23/2019	<5.0	**5.3**	**140**	**0.29 J**	<0.25	**52**	**8.6**	**120**	**46**	**0.11**	<1.0	**85**	**1.7 J**	<0.89	<5.0	**32**	**140**
DG-AK15	6	3.5-4	DG-AK15S-3.5-4	1/23/2019	<5.0	**7.8**	**100**	**0.63**	**1.8**	**34**	**8.7**	**43**	**45**	**0.21**	<1.0	**25**	**1.7 J**	<0.89	<5.0	**37**	**660**
DG-AK16	6	0.5-1	DG-AK16S-0.5-1	1/22/2019	<0.29 U	**4.5**	**63**	<0.12 U	**0.25 J**	**63**	**7.0**	**21**	**50**	**0.18**	<0.23 U	**33**	<0.53 U	**0.88 U**	<0.51 U	**46**	**91**
DG-AK16	6	3.5-4	DG-AK16S-3.5-4	1/22/2019	**1.2 J**	**11**	**130**	**0.35**	**0.46**	**48 J**	**13 J**	**25**	**49 J**	**0.19**	**0.23 J**	**30**	**0.84 J**	<0.12 U	**1.2 U**	**49**	**76 J**
DG-AK16 (D)	6	0.5-1	DG-AK16 (D)S-0.5-1	1/22/2019	**3.3**	**9.8**	**130**	**0.5**	**0.53**	**52**	**16**	**45**	**66**	**0.16**	**0.16 J**	**32**	**1.6 J**	<0.12 U	**0.62 J**	**53**	**110**
DG-AL14	6	0.5-1	DG-AL14S-0.5-1	1/22/2019	**1.2 J**	**13**	**61**	**0.86**	**0.19 J**	**53**	**17**	**30**	**5.1**	**0.032**	**4.3**	**38**	**3.2 U**	**0.80 U**	<0.46 U	**57**	**63**
DG-AL14	6	3.5-4	DG-AL14S-3.5-4	1/22/2019	**1.2 J**	**3.7**	**80**	**0.29 U**	**0.14 J**	**67**	**8.8**	**21**	**11**	**0.11**	<0.18 U	**36**	**2.9 U**	<0.14 U	<0.41 U	**62**	**35**
DG-AL14 (D)	6	0.5-1	DG-AL14 (D)S-0.5-1	1/22/2019	**1.9**	**7.7**	**51**	**0.92**	**0.35**	**39**	**14**	**38**	**4.7**	**0.025**	<0.16 U	**29**	**2.0 J**	**0.18 J**	**0.69 J**	**55**	**55**
DG-AL15	6	1-1.5	DG-AL15S-1-1.5	1/22/2019	**3.6**	**5**	**170**	**0.32**	**0.63**	**230**	**9.2**	**57**	**87**	**0.28**	**0.18 J**	**36**	**0.64 J**	<0.11 U	<0.32 U	**45**	**250**
DG-AL16	6	0.5-1	DG-AL16S-0.5-1	1/22/2019	**4.4**	**5.9**	**150**	**0.32 U**	**1.5**	**160**	**9.8**	**49**	**390**	**0.14**	**4.9**	**44**	**1.2 J**	**3.4**	<0.46 U	**44**	**320**
DG-AM14	6	1-1.5	DG-AM14S-1-1.5	1/22/2019	**0.50 J**	**5.4**	**47**	<0.098 U	**0.12 J**	**77**	**9.3**	**32**	**12**	**0.021**	<0.19 U	**41**	<0.45 U	<0.15 U	<0.44 U	**60**	**34**
DG-AM15	6	0.5-1	DG-AM15S-0.5-1	1/23/2019	<5.0	**7.4**	**30**	**0.74**	<0.25	**30**	**12**	**16**	**4.3**	**0.042**	<0.99	**28**	<1.7	<0.88	<5.0	**43**	**42**
DG-AM15	6	3.5-4	DG-AM15S-3.5-4	1/23/2019	<5.0	**5.3**	**110 J-**	**0.30 J**	**0.37 J**	**66 J-**	**5.2**	**31**	**180 J**	**0.086**	<1.0	**31**	<1.7	<0.89	<5.0	**28**	**130 J-**
DG-AM15	6	9.5-10	DG-AM15S-9.5-10	1/23/2019	<5.0	**6.3**	**87**	**0.43 J**	**0.27 J**	**49**	**9.4**	**33**	**29**	**0.033**	<0.99	**33**	<1.7	<0.88	<5.0	**48**	**63**
DG-AM15 (D)	6	9.5-10	DG-AM15 (D)S-9.5-10	1/23/2019	<4.9	**7.8**	**88**	**0.62 J**	<0.25 UJ	**48**	**8.1**	**37**	**21**	**0.039**	<0.99	**32**	<1.7	<0.88	<4.9	**53**	**64**
DG-AN14	6	0.5-1	DG-AN14S-0.5-1	1/21/2019	**0.94 J**	**1.7 J**	**140**	<0.12	**0.14 J**	**29**	**5.3**	**24**	**49**	**0.034**	**0.41 J**	**24**	<0.55	<0.18	<0.53	**29**	**86**
DG-AO14	6	0.5-1	DG-AO14S-0.5-1	1/21/2019	**1.2 J**	**7.2**	**87**	**0.69**	**0.19 J**	**29**	**11**	**34**	**40**	**0.035**	**0.21 J**	**27**	<0.49	<0.17	<0.48	**38**	**62**
DG-AP12	6	0.5-1	DG-AP12S-0.5-1	1/31/2019	**45**	**44**	**1,100**	**0.54 J**	**6.7**	**110**	**13**	**1,900**	**10,000**	**1.0**	**1.7 J**	**99**	**8.2 J**	**11**	<1.3 U	**37**	**4,700**
DG-AP12	6	3.5-4	DG-AP12S-3.5-4	1/31/2019	**36**	**23**	**1,200**	**0.51 J**	**2.4**	**48**	**9.6**	**1,000**	**5,100**	**1.3**	**1.1 J**	**49**	**7.2 J**	**5.6**	<1.1 U	**27**	**2,500**
DG-AP13	6	0.5-1	DG-AP13S-0.5-1	1/23/2019	<5.0	**6.3**	**98**	**0.49 J**	<0.25	**95**	**9.6**	**27**	**24 J**	**0.12**	<1.0	**23**	<1.7	<0.89	<5.0	**44**	**56 J**
DG-AP13	6	3.5-4	DG-AP13S-3.5-4	1/23/2019	<5.0	**3.7**	**120**	**0.40 J**	<0.25	**80**	**12**	**27**	**7.1**	**0.12**	<1.0	**41**	<1.7	<0.89	<5.0	**75**	**40**
DG-AP13	6	9.5-10	DG-AP13S-9.5-10	1/23/2019	**15 J**	**27**	**170**	<0.50	**1.9**	**25**	**20**	**1,100**	**4,100**	**0.086**	**2.1 J**	**57**	**3.7 J**	<1.8	<10	**27**	**1,300**
DG-AP13 (D)	6	0.5-1	DG-AP13 (D)S-0.5-1	1/23/2019	<5.0	**8.7**	**120**	**0.47 J**	<0.25	**150**	**11**	**43**	**51 J**	**0.19**	<0.99	**28**	<1.7	<0.88	<5.0	**51**	**170 J**
DG-AP14	6	0.5-1	DG-AP14S-0.5-1	1/22/2019	**1.2**	**11**	**96**	**0.49**	**0.16 J**	**50**	**9.8**	**27**	**42**	**0.061**	**0.20 J**	**33**	**2.4 U**	**0.59 U**	<0.34 U	**51**	**62**
DG-AP14	6	3.5-4	DG-AP14S-3.5-4	1/22/2019	**2.2**	**16**	**73**	**0.36 U**	**0.13 J**	**42**	**5.5**	**69**	**12**	**0.098**	**0.27 J**	**24**	**3.6 U**	<0.18 U	<0.52 U	**59**	**34**
DG-AQ12	6	0.5-1	DG-AQ12S-0.5-1	1/21/2019	**1.3**	**2.3**	**350**	**0.63**	**0.28**	**44**	**19**	**75**	**6.7**	**0.54**	**0.99 J**	**46**	**0.89 J**	**0.26 J**	<0.32	**100**	**75**
DG-AQ12	6	3.5-4	DG-AQ12S-3.5-4	1/21/2019	**1.7**	**8.3**	**130**	**0.48**	**0.13 J**	**56**	**19**	**45**	**21**	**0.052**	**0.23 J**	**34**	<0.43	<0.15	<0.42	**56**	**47**
DG-AQ13	6	0.5-1	DG-AQ13S-0.5-1	1/21/2019	**1.3 J**	**4.1**	**520**	**0.75**	**0.37**	**43**	**29**	**91**	**9.6**	**0.49**	**1.8**	**63**	**1.6 J**	**0.64 J**	<0.42	**110**	**89**
DG-AQ13	6	11.5-12	DG-AQ13S-11.5-12	1/21/2019	**59**	**24**	**1,500**	**0.56 J**	**6.1**	**81**	**24**	**1,400**	**9,200**	**1.8**	**0.27 J**	**82**	**3.1 J**	**7.0**	<1.9	**36**	**4,900**
DG-AQ13	6	3.5-4	DG-AQ13S-3.5-4	1/21/2019	**0.99 J**	**4.2**	**96**	**0.34 J**	**0.10 J**	**42**	**9.8**	**20**	**12**	**0.85**	<0.22	**29**	<0.52	<0.18	<0.50	**45**	**43**
DG-AR12	6	0.5-1	DG-AR12S-0.5-1	1/21/2019	**0.89 J**	**6.1**	**110**	**0.6**	**0.14 J**	**63**	**11**	**26**	**23**	**0.088**	**0.19 J**	**26**	**0.65 J**	**0.19 J**	<0.31	**51**	**50**
DG-AR12	6	3.5-4	DG-AR12S-3.5-4	1/21/2019	**40**	**20**	**920**	**0.20 J**	**26**	**2000**	**11**	**1,600**	**5,200**	**22**	**0.94 J**	**58**	**8.1**	**9.8**	<1.2	**36**	**3,800**
DG-AR13	6	0.5-1	DG-AR13S-0.5-1	1/23/2019	<5.0	**6.1**	**120**	**1.4**	**0.37 J**	**170**	**11**	**62**	**64**	**0.36 J-**	<1.0	**33**	<1.7	<0.89	<5.0	**54**	**180**
DG-AR13	6	3.5-4	DG-AR13S-3.5-4	1/23/2019	**36**	**27**	**710**	**1.2**	**2.9**	**100**	**10**	**1,600**	**1,900**	**2.7**	**3.7**	**53**	<1.7	**3.8**	<5.0	**50**	**1,800**
DG-AR13	6	9.5-10	DG-AR13S-9.5-10	1/23/2019	**17**	**20**	**930**	**0.52**	**7.1**	**42**	**11**	**790**	**3,000**	**1.6**	**2.2**	**39**	**1.8 J**	**4.0**	<5.0	**22**	**2,000**
DG-AS11	6	0.5-1	DG-AS11S-0.5-1	1/31/2019	**19**	**20**	**550**	**0.32**	**3.3**	**59**	**7.2**	**430**	**3,200**	**1.5**	**0.68 J**	**34**	**3.9**	**4.0**	<0.34	**22**	**1,400**
DG-AS11	6	3.5-4	DG-AS11S-3.5-4	1/31/2019	**39**	**30**	**1,700**	**0.49**	**11**	**360**	**13**	**2,400**	**7,100**	**1.4**	**1.0 J**	**73**	<1.2	**8.6**	<1.2	**43**	**4,100**
DG-AS11	6	7.5-8	DG-AS11S-7.5-8	1/31/2019	**63**	**34**	**1,300**	**0.97**	**8.8**	**43**	**13**	**1,300**	**7,300**	**0.26**	**1.6**	**55**	**2.8 J**	**6.3**	<1.1	**35**	**3,100**
DG-AS12	6	0.5-1	DG-AS12S-0.5-1	1/21/2019	**5.3**	**6.6**	**210**	**0.49**	**0.87**	**200**	**10**	**170**	**470**	**0.69**	**0.24 J**	**36**	**1.2 J**	**1.1**	<0.43	**46**	**590**
DG-AS12	6	3.5-4	DG-AS12S-3.5-4	1/21/2019	**5.3**	**8.0**	**140**	**0.46**	**0.65**	**240**	**12**	**100**	**360**	**1.8**	<0.22	**35**	**0.69 J**	**0.54 J**	<0.50	**38**	**410**
DG-AT11	6	3.5-4	DG-AT11S-3.5-4	1/21/2019	**7.0**	**8.7 J**	**230**	**0.16 J**	**1.6 J**	**33 J**	**5.8 J**	**240 J**	**210**	**0.24 J**	**0.79 J**	**58**	<1.1	**0.40 J**	<1.1	**3.9**	**970**
DG-AT11 (D)	6	3.5-4	DG-AT11 (D)S-3.5-4	1/21/2019	**8.7**	**2.8 J**	**190**	<0.11 UJ	**0.74 J**	**12 J**	**3.4 J**	**980 J**	**160**	**0.057 J**	**0.86 J**	**49**	<1.2	<0.16 UJ	<0.47	**3.9**	**1,200**
DG-AT12	6	0.5-1	DG-AT12S-0.5-1	1/23/2019	**51**	**25**	**530**	<0.50	**6.1**	**1400**	**4.5**	**630**	**11,000**	**0.26**	<2.0	**52**	<3.4	<1.8	<10	**12**	**3,800**
DG-AT12	6	3.5-4	DG-AT12S-3.5-4	1/23/2019	<5.0	**10**	**150**	**0.43 J**	**0.29 J**	**110**	**7.5**	**79**	**120**	**0.014 J**	<1.0	**34**	<1.7	<0.89	<5.0	**56**	**190**
DG-AT12	6	9.5-10	DG-AT12S-9.5-10	1/23/2019	**51**	**29**	**1,600**	<1.2	**4.8**	**53**	<2.5	**1,100**	**6,600**	<0.012	<5.0	**74**	<8.4	**5.6 J**	<25	**25**	**2,900**
DG-AU11	6	0.5-1	DG-AU11S-0.5-1	1/23/2019	<5.0	**5.5**	**84**	**0.5**	<0.25	**54**	**9.6**	**22**	**12**	**0.16**	<1.0	**32**	<1.7	<0.89	<5.0	**50**	**49**
DG-AU11	6	3.5-4	DG-AU11S-3.5-4	1/23/2019	<5.0	**4.7**	**97**	**0.43 J**	<0.25	**49**	**9.7**	**24**	**11**	**0.15**	<1.0	**29**	<1.7	<0.89	<5.0	**49**	**46**
DG-AU11	6	9.5-10	DG-AU11S-9.5-10	1/23/2019	**58**	**40**	**990**	<0.50	**4.1**	**1200**	**6.4**	**2,900**	**8,400**	**11**	**3.8 J**	**56**	**4.7 J**	**31**	<10	**15**	**2,900**
DG-AV10	6	0.5-1	DG-AV10S-0.5-1	1/21/2019	**2.6**	**9**	**150**	**0.46**	**0.98**	**250**	**11**	**110**	**140**	**0.38**	**0.32 J**	**52**	**1.4 J**	<0.12	<0.35 U	**47**	**400**

Table 2: Metals Concentrations in Soil
Brisbane Baylands OU-2
Brisbane, California

Sample Location	Investigation Zone	Depth Range (ft bgs)	Sample Name	Collection Date	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
Direct Exposure Human Health Risk Level Residential Soil Exposure ESL [1]					1.1E+01	6.7E-02	1.5E+04	1.6E+01	7.8E+01	1.2E+05	2.3E+01	3.1E+03	8.0E+01	1.3E+01	3.9E+02	8.2E+02	3.9E+02	3.9E+02	7.8E-01	3.9E+02	2.3E+04
Regional Background [2]					5.5E+00	1.9E+01	3.2E+02	1.0E+00	2.7E+00	1.0E+02	2.5E+01	6.9E+01	1.6E+01	4.0E-01	7.4E+00	1.2E+02	5.6E+00	1.8E+00	7.6E+00	7.4E+01	1.1E+02
Units					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
DG-AV10	6	14.5-15	DG-AV10S-14.5-15	1/21/2019	**48**	**20**	**1,600**	**0.81**	**66**	**970**	**13**	**5,100**	**7,200**	**13**	**1.9 J**	**3,400**	**2.4 J**	**11**	<0.85	**31**	**7,300**
DG-AV10	6	3.5-4	DG-AV10S-3.5-4	1/21/2019	**1.2 U**	**6.1**	**55**	**0.48**	**0.47**	**37**	**12**	**52**	**41**	**0.23**	<0.15	**33**	**0.71 J**	<0.12	<0.34 U	**34**	**190**
DG-AV12	6	0.5-1	DG-AV12S-0.5-1	1/22/2019	**5.2**	**21**	**310**	**0.81**	**1.1**	**730**	**19**	**180**	**230**	**0.6**	**3.5**	**55**	**7.2 U**	<0.37 U	<1.1 U	**55**	**750**
DG-AV12	6	19.5-20	DG-AV12S-19.5-20	1/22/2019	**1.2**	**9.3**	**150**	**0.46**	**0.21 J**	**51**	**22**	**35**	**6.7**	**0.035**	**0.19 J**	**48**	**2.4 U**	**0.60 U**	<0.35 U	**67**	**87**
DG-AV12	6	3.5-4	DG-AV12S-3.5-4	1/22/2019	**0.81 J**	**9.9**	**100**	**0.4**	**0.095 J**	**70**	**8.7**	**48**	**6.3**	**0.082**	<0.18 U	**48**	**2.8 U**	**0.70 U**	<0.41 U	**74**	**48**
DG-AW10	6	0.5-1	DG-AW10S-0.5-1	1/21/2019	**1.7 U**	**6.8**	**59**	**0.8**	**0.46**	**67**	**15**	**27**	**18**	**0.068**	<0.22	**61**	**1.1 J**	<0.17	<0.49 U	**61**	**77**
DG-AW10	6	3.5-4	DG-AW10S-3.5-4	1/21/2019	<0.26	**2.4 J**	**27**	<0.10	**0.13 J**	**38**	**3.7**	**17**	**9.6**	**0.023**	<0.20	**19**	**0.77 J**	<0.16	<0.46 U	**22**	**33**
DG-AW11	6	0.5-1	DG-AW11S-0.5-1	1/23/2019	<5.0	**8.3**	**73**	**0.69**	<0.25	**170**	**12**	**44**	**41**	**0.16**	<1.0	**30**	<1.7	<0.89	<5.0	**46**	**120**
DG-AW11	6	3.5-4	DG-AW11S-3.5-4	1/23/2019	<5.0	**4.9**	**150**	**0.38 J**	<0.25	**780**	**6.1**	**49**	**59**	**0.22**	<1.0	**24**	<1.7	<0.89	<5.0	**35**	**200**
DG-AW11	6	7.5-8	DG-AW11S-7.5-8	1/23/2019	<50	<15	**130**	<2.5	<2.5	**8700**	<5.0	**85**	**69**	**2.6 J-**	<10	**13 J**	<17	<8.9	<50	**22**	**1,200**
DG-AX10	6	0.5-1	DG-AX10S-0.5-1	1/21/2019	**1.1 U**	**5.2**	**110**	**0.49**	**0.4**	**53**	**12**	**32**	**11**	**0.16**	**0.32 J**	**47**	<0.32	<0.11	<0.31 U	**59**	**60**
DG-AX10	6	3.5-4	DG-AX10S-3.5-4	1/21/2019	**1.7 U**	**10**	**72**	**0.75**	**0.35 J**	**48**	**7.2**	**58**	**17**	**0.057**	<0.22	**35**	<0.52	<0.17	<0.50 U	**56**	**64**
DG-AX11	6	0.5-1	DG-AX11S-0.5-1	1/21/2019	**5.9 J-**	**5.1**	**100 J+**	**0.54**	**0.49**	**440**	**13**	**54**	**88 J**	**0.41**	<0.19	**35**	**0.93 J**	<0.15	<0.42 U	**49**	**230**
DG-AX11	6	3.5-4	DG-AX11S-3.5-4	1/21/2019	**1.5 J**	**6.7**	**78**	**0.92**	**0.27 J**	**30**	**11**	**20**	**13**	**0.042**	**0.31 J**	**24**	**2.3 J**	<0.18	<0.52	**41**	**46**
DG-AY9	6	0.5-1	DG-AY9S-0.5-1	1/21/2019	**1.6 U**	**8.9**	**120**	**0.51**	**0.81**	**55**	**15**	**48**	**63**	**0.1**	<0.21	**34**	**1.6 J**	<0.16	<0.47 U	**53**	**140**
DG-AY9	6	3.5-4	DG-AY9S-3.5-4	1/21/2019	**1.1 U**	**6.5**	**110**	**0.62**	**0.26 J**	**58**	**12**	**19**	**10**	**0.04**	<0.14	**30**	**0.73 J**	<0.11	<0.31 U	**53**	**42**
DG-AZ10	6	0.5-1	DG-AZ10S-0.5-1	1/21/2019	**1.5 U**	**5.8**	**140**	**0.6**	**0.27 J**	**38**	**12**	**16**	**6.4**	**0.019**	<0.19	**29**	**0.48 J**	<0.15	<0.43 U	**46**	**35**
DG-AZ10	6	3.5-4	DG-AZ10S-3.5-4	1/21/2019	**1.8 U**	**7.8**	**99**	**0.51**	**0.28 J**	**44**	**7.3**	**21**	**8.1**	**0.025**	<0.23	**27**	**1.6 J**	<0.18	<0.52 U	**51**	**42**

Notes:

1. San Francisco Bay RWQCB, 2019. Summary of Soil ESLs, Jan. 2019 (Rev. 1) - Direct Exposure Human Health Risk Levels (Table S-1) Res: Shallow Soil Exposure. The chromium ESL is for chromium(III).
2. All except cobalt: Table 3, 95th Percentiles in Diamond, D. et al., 2009. Analysis of Background Distributions of Metals in the Soil at Lawrence Berkeley National Laboratory. April.
   Cobalt: RWQCB, 2017. Letter from Vic Pal to Howard Pearce Re Concurrence with Proposed Revisions to the Baylands Soil Processing Acceptance Criteria, Brisbane Landfill, San Mateo County. 14 September.

- The RWQCB ESL is used as comparison criteria when available unless the regional background is higher, in which case regional background is used as the comparison criteria.
- Metals were analyzed by USEPA Methods 6010B and 7471A.
- Non-detect results are presented with "<" followed by the MDL.
- Results in bold font indicate a detection above the MDL.
- Gray shading indicates a detection above the screening level.

Abbreviations and Symbols:

"J" - Analyte was detected but the associated numerical value is the approximate concentration.
"J+" - Analyte was detected but the associated numerical value is likely to be higher than the concentration of the analyte in the sample due to positive bias of associated QC or calibration data or attributable to matrix interference.
"J-" - Analyte was detected but the associated numerical value is likely to be lower than the concentration of the analyte in the sample due to negative bias of associated QC or calibration data or attributable to matrix interference.
"R" - The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.
"U" - Not detected at or above the reported result.
"UJ" - The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
"--" - Not Available
"<" - Non-detect result
(D) - Duplicate sample
ESL - Environmental Screening Level
ft bgs - Feet below ground surface
MDL - Method Detection Limit
mg/kg - milligram per kilogram
QC - quality control
RWQCB - Regional Water Quality Control Board
USEPA - United States Environmental Protection Agency

Table 3: Polynuclear Aromatic Hydrocarbons and TPH as Diesel and Motor Oil Concentrations in Soil
Brisbane Baylands OU-2
Brisbane, California

Sample Location	Investigation Zone	Depth Range (ft bgs)	Sample Name	Collection Date	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Chrysene	Dibenzo(a,h)anthracene	Indeno(1,2,3-cd)pyrene	Benzo(a)pyrene Equivalent Total PAHs [4]	2-Methylnaphthalene	Acenaphthene	Acenaphthylene	Anthracene	Benzo(g,h,i)perylene	Fluoranthene	Fluorene	Naphthalene	Phenanthrene	Pyrene	TPH-Diesel (C10-C28)	TPH-Motor Oil (C24-C36)
Direct Exposure Human Health Risk Level Residential Soil Exposure ESL [1]					1.1E+03	1.1E+02	1.1E+03	1.1E+04	1.1E+05	1.1E+02	1.1E+03	--	2.4E+05	3.6E+06	--	1.8E+07	--	2.4E+06	2.4E+06	3.8E+03	--	1.8E+06	2.6E+02	1.2E+04
Leaching to Groundwater Levels Non-drinking Water ESL [2]					1.0E+04	5.7E+03	7.5E+04	3.9E+04	1.0E+04	3.9E+05	3.2E+04	--	8.8E+02	1.2E+04	6.4E+03	1.9E+03	2.7E+04	8.6E+04	6.0E+03	1.2E+03	1.1E+04	4.5E+04	7.3E+03	--
Regional Background [3]					--	--	--	--	--	--	--	9.0E+02	--	--	--	--	--	--	--	--	--	--	--	--
Units					µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	mg/kg	mg/kg
DG-N1	1	0.5-1	DG-N1S-0.5-1	12/18/2018	**50**	**70**	**130**	**47**	**81**	**19 J**	**44**	**112**	**31 J**	<11	**23**	**58**	**50**	**91**	<8.7	**33**	**53**	**100**	**82**	**210**
DG-N1	1	3.5-4	DG-N1S-3.5-4	12/18/2018	**2.7 J**	**4.2 J**	**9.2**	**2.9 J**	**7**	<3.5	<4.2	**7**	<4.9	<2.8	<2.4	<2.0	**5.6**	**3.6 J**	<2.2	**3.6 J**	**11**	**5.8**	**3.2**	<10
DG-N4	1	4.5-5	DG-N4S-4.5-5	12/19/2018	**10**	**7.4**	**57**	**5.7**	**55**	**6.2**	**7.5**	**21**	**740**	**250**	**73**	**200**	**10**	**44**	**330**	**280**	**720**	**69**	**2,800**	<200
DG-N4	1	8.5-9	DG-N4S-8.5-9	12/19/2018	**2.8 J**	**4.3 J**	**18**	**3.1 J**	**11**	<3.5	<4.2	**8**	<5.0	<2.8	<2.4	**3.4 J**	**4.8 J**	**9.1**	**3.6 J**	**4.3 J**	**15**	**11**	**29**	**40 J**
DG-N5	1	0.5-1	DG-N5S-0.5-1	1/8/2019	**88**	**100**	**170**	**67**	**120**	**14**	**48**	**145**	**27**	<5.4	**24**	**48**	**58**	**130**	<4.3	**23**	**60**	**140**	**68**	**190**
DG-N5 (D)	1	0.5-1	DG-N5 (D)S-0.5-1	1/8/2019	**40**	**72**	**87**	**27**	**68**	**8.1**	**47**	**98**	**12**	**3.3**	**28**	**36**	**68**	**160**	**4.2**	**16**	**140**	**230**	**35**	**86**
DG-N5 (D)	1	0.5-1	DG-N5 (D)S-0.5-1	1/24/2019	**71 J**	**43 J**	**59 J**	<39 UJ	**48 J**	<39	<39 UJ	**78**	<39	**200 J**	<39	**75 J**	<39 UJ	**400 J**	**47 J**	<39	**280 J**	**220 J**	**100**	**110 J**
DG-N5	1	3.5-4	DG-N5S-3.5-4	1/8/2019	**5.6**	**4.4**	**9.7**	**3**	**13**	<3.4	**4.8**	**8**	<4.9	<2.7	<2.3	**2.1**	**7.5**	**11**	<2.1	**5**	**13**	**12**	**38**	**74**
DG-O3	1	0.5-1	DG-O3S-0.5-1	12/18/2018	**4.3 J**	**5.2**	**7.2**	**3.4 J**	**3.3 J**	<3.5	<4.2	**8**	<5.0	<2.8	<2.4	<2.0	**5.8**	**5.4**	<2.2	<3.5	**3.1 J**	**6.2**	**4.2**	**13 J**
DG-O3	1	3.5-4	DG-O3S-3.5-4	12/18/2018	**3.3 J**	**5.1**	**8.1**	**3.3 J**	**4.5 J**	<3.5	<4.2	**8**	**6.8 J**	<2.8	<2.4	<2.0	**5.6**	**8.2**	<2.2	**4.7 J**	**10**	**8.9**	**2.0 U**	<10
DG-O4	1	4.5-5	DG-O4S-4.5-5	12/19/2018	**8.8 J**	**14 J**	**25 U**	**10 J**	**13 J**	<17	<21	**27**	**130**	**220**	**52**	**110**	<21	**31**	**250**	**97**	**210**	**63**	**2,000**	<99
DG-O4	1	9.5-10	DG-O4S-9.5-10	12/19/2018	**2.8 J**	**5.1**	**21**	**2.8 J**	**9.1**	<3.5	<4.2	**9**	**7.7 J**	**14**	**3.8 J**	**8.1**	**5.6**	**7.9**	**16**	**11**	**21**	**12**	**130**	**21 J**
DG-P1	1	0.5-1	DG-P1S-0.5-1	11/21/2018	**120 J**	**180 J**	**170**	**64**	**130 J**	**34**	**86**	**252**	**16**	**15**	**43**	**45**	**110**	**180 J**	**16**	**25**	**120 J**	**220**	**15**	**43 J**
DG-P1	1	3.5-4	DG-P1S-3.5-4	11/21/2018	**6.9 J**	**12**	**14**	**5.3 J**	**12 J**	**4.0 J**	**9**	**19**	**7.3 J**	**5.4 J**	**3.8 J**	**4.0 J**	**13**	**15 J**	**4.0 J**	**9.6**	**22 J**	**18 J**	**3.5**	**10 J**
DG-P1 (D)	1	3.5-4	DG-P1 (D)S-3.5-4	11/21/2018	**18 J**	**20**	**21**	**9.1 J**	**22 J**	**4.5 J**	**11**	**30**	**6.0 J**	**4.9 UJ**	**5.4 J**	**14 J**	**15**	**39 J**	**6.8 J**	**7.7**	**53 J**	**44 J**	**4.7**	**16 J**
DG-P4	1	4.5-5	DG-P4S-4.5-5	12/19/2018	**27 J**	**36 J**	**80**	**25 J**	**72**	<35	<42	**67**	**730**	**240**	**110**	**230**	<43	**84**	**360**	**520**	**270**	**140**	**3,600**	<200
DG-P4	1	7.5-8	DG-P4S-7.5-8	12/19/2018	**2.5 J**	**4.3 J**	**31**	**3.2 J**	**36**	**4.7 J**	<4.2	**13**	**11**	**5**	**2.8 J**	**6**	**6.1**	**12**	**6.7**	**23**	**83**	**12**	**54**	**15 J**
DG-P5	1	0.5-1	DG-P5S-0.5-1	1/8/2019	**31**	**46**	**80**	**25**	**54**	**6.7**	**22**	**66**	**34**	**3.3**	**14**	**27**	**25**	**58**	**2.4**	**38**	**47**	**72**	**35**	**110**
DG-P5	1	3.5-4	DG-P5S-3.5-4	1/8/2019	**29**	**34**	**62**	**23**	**41**	<17	<20	**53**	<24	<13	<11	**9.9**	**27**	**37**	<10	**25**	**30**	**54**	**100**	**940**
DG-Q3	1	0.5-1	DG-Q3S-0.5-1	12/18/2018	**6**	**8.7**	**11**	**4.9 J**	**6.9**	<3.5	**5.9**	**13**	**5.2 J**	<2.8	**2.5 J**	**3.0 J**	**8.6**	**12**	<2.2	<3.5	**7.5**	**15**	**11**	**31 J**
DG-Q3	1	3.5-4	DG-Q3S-3.5-4	12/18/2018	<1.5	**2.5 J**	**5.0 U**	<2.1	<1.4	<3.5	<4.2	**5**	<5.0	<2.8	<2.4	<2.0	<4.3	**1.6 J**	<2.2	<3.5	<1.8	<1.7	**2.5**	<10
DG-Q7	1	0.5-1	DG-Q7S-0.5-1	1/8/2019	**85**	**120**	**200**	**66**	**160**	**26**	**93**	**185**	**68**	<13	**64**	**180**	**170**	**190**	**12**	**49**	**180**	**230**	**270**	**530**
DG-Q7	1	3.5-4	DG-Q7S-3.5-4	1/8/2019	**11**	**11**	**32**	**9.4**	**27**	**4.4**	**10**	**21**	**27**	<2.8	**7.5**	**20**	**13**	**28**	<2.2	**40**	**44**	**27**	**61**	**150**
DG-Q7 (D)	1	3.5-4	DG-Q7 (D)S-3.5-4	1/8/2019	**67**	**89**	**160**	**52**	**120**	<17	**57**	**127**	**57**	<13	**45**	**140**	**80**	**120**	<11	**40**	**90**	**150**	**280**	**520**
DG-R1	1	0.5-1	DG-R1S-0.5-1	12/17/2018	**190**	**310**	**470**	**130**	**390**	**68**	**170**	**463**	**120**	<14	**130**	**180**	**240**	**300**	**12 J**	**110**	**200**	**620**	**190**	**440**
DG-R1	1	3.5-4	DG-R1S-3.5-4	12/17/2018	**5**	**4.3 J**	**26**	**3.3 J**	**22**	**4.0 J**	**4.6 J**	**12**	**72**	**4.0 J**	**2.6 J**	**120**	**6.9**	**11**	**13**	**21**	**52**	**12**	**92**	**61**
DG-R5	1	0.5-1	DG-R5S-0.5-1	1/29/2019	**230**	**280**	**440**	**140**	**240**	**46**	**120**	**407**	**73**	<14	**32**	**48**	**130**	**330**	<11	**70**	**140**	**300**	**62**	**150**
DG-R5	1	3.5-4	DG-R5S-3.5-4	1/29/2019	**82**	**110**	**140**	**33**	**110**	**18**	**49**	**156**	**10 J**	<5.5	**19**	**12 J**	**56**	**110**	<4.3	**12**	**45**	**140**	**11**	**32 J**
DG-R5 (D)	1	3.5-4	DG-R5 (D)S-3.5-4	1/29/2019	**73**	**97**	**150**	**47**	**100**	**16**	**40**	**140**	**14 J**	<5.5	**21**	**21 J**	**48**	**110**	<4.3	**14**	**53**	**130**	**10**	**35 J**
DG-S3	1	0.5-1	DG-S3S-0.5-1	12/18/2018	**21**	**28**	**42**	**13**	**30**	**5.1**	**15**	**41**	**22**	<2.8	**8.9**	**12**	**18**	**42**	<2.2	**17**	**31**	**57**	**90**	**230**
DG-S3	1	3.5-4	DG-S3S-3.5-4	12/18/2018	**31 J**	**84 J**	**130**	**43 J**	**70 J**	<70	<84	**140**	<99	<56	<48	<40	<86	**75 J**	<44	<70 UJ	**97 J**	**81 J**	**740**	**4,700**
DG-S7	1	0.5-1	DG-S7S-0.5-1	1/8/2019	**85**	**120**	**180**	**67**	**140**	**19**	**61**	**172**	**33**	<14	**49**	**89**	**90**	**160**	<11	**32**	**100**	**200**	**260**	**710**
DG-S7	1	3.5-4	DG-S7S-3.5-4	1/8/2019	**18**	**13**	**26**	**8.2**	**33**	<3.4	**8.6**	**20**	**15**	<2.7	**6.6**	**12**	**11**	**52**	**3.8**	**34**	**53**	**55**	**97**	**140**
DG-T1	1	0.5-1	DG-T1S-0.5-1	12/17/2018	**140**	**250**	**360**	**100**	**240**	**50 J**	**130 J**	**364**	**83**	<14	**100**	**110**	**170 J**	**200 J**	**12 J**	**78**	**130**	**400 J**	**180**	**540**
DG-T1	1	3.5-4	DG-T1S-3.5-4	12/17/2018	**3.7 J**	**5.9 J**	**14**	**3.6 J**	**12 J**	<3.5	<4.2	**10**	<5.0	<2.8	<2.4	**2.0 J**	**6.3 J**	**6.5 J**	<2.2	**6.4 J**	**25 J**	**10**	**2.0 UJ**	<10
DG-T1 (D)	1	3.5-4	DG-T1 (D)S-3.5-4	12/17/2018	**2.8 J**	**4.7 J**	**9.5**	**2.7 J**	**5.8 J**	<3.5	<4.2	**8**	<5.0	<2.8	<2.4	**2.2 J**	**4.6 J**	**3.8 J**	<2.2	<3.5 UJ	**12 J**	**7**	**5.8 J**	**19 J**
DG-T5	1	0.5-1	DG-T5S-0.5-1	1/8/2019	**33**	**55**	**54**	**19**	**47**	**9.3**	**29**	**76**	**17**	**3.1**	**4.9**	**10**	**42**	**51**	<2.2	**25**	**33**	**67**	**22**	**47**
DG-T5	1	3.5-4	DG-T5S-3.5-4	1/8/2019	<1.5	**2.6**	**4.3**	<2.1	**2.3**	<3.5	<4.1	**5**	<4.9	<2.8	<2.4	<2.0	<4.2	**2**	<2.2	<3.5	<1.8	**2.3**	**3.4**	<9.9
DG-U3	1	0.5-1	DG-U3S-0.5-1	12/18/2018	**55**	**61**	**130**	**47**	**81**	**11**	**32**	**94**	**70**	<5.6	**26**	**65**	**32**	**130**	**5.2 J**	**72**	**110**	**130**	**98**	**220**
DG-U3	1	3.5-4	DG-U3S-3.5-4	12/18/2018	**16 J**	**10 J**	**110 J**	**13 J**	**130**	**14 J**	**13**	**38**	**130 J**	**20**	**11**	**27 J**	**17 J**	**140**	**12**	**280 J**	**650 J**	**70 J**	**12 J**	**36 J**
DG-U3 (D)	1	3.5-4	DG-U3 (D)S-3.5-4	12/18/2018	**79 J**	**140 J**	**210 J**	**75 J**	**120**	**70 J**	<84	**244**	<100 UJ	<56	<48	**110 J**	**110 J**	**140**	<44	**92 J**	**230 J**	**140 J**	**330 J**	**2,200 J**
DG-U7	1	0.5-1	DG-U7S-0.5-1	1/8/2019	**10**	**20**	**30**	**13**	**25**	**6.4**	**22**	**33**	**5.8**	<2.6	**5.8**	**11**	**33**	**19**	<2.1	**5.8**	**11**	**23**	**15**	**52**
DG-U7	1	3.5-4	DG-U7S-3.5-4	1/8/2019	**23**	**20**	**38**	**15**	**44**	**4.4**	**14**	**32**	**91**	<2.7	**11**	**11**	**20**	**40**	**6.5**	**79**	**59**	**51**	**28**	**62**
DG-V1	1	0.5-1	DG-V1S-0.5-1	12/17/2018	**150**	**260**	**300**	**85**	**230**	**49**	**150**	**370**	**34**	<5.6	**83**	**45**	**200**	**190**	**11**	**48**	**96**	**440**	**41**	**76**

Table 3: Polynuclear Aromatic Hydrocarbons and TPH as Diesel and Motor Oil Concentrations in Soil
Brisbane Baylands OU-2
Brisbane, California

Sample Location	Investigation Zone	Depth Range (ft bgs)	Sample Name	Collection Date	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Chrysene	Dibenzo(a,h)anthracene	Indeno(1,2,3-cd)pyrene	Benzo(a)pyrene Equivalent Total PAHs [4]	2-Methylnaphthalene	Acenaphthene	Acenaphthylene	Anthracene	Benzo(g,h,i)perylene	Fluoranthene	Fluorene	Naphthalene	Phenanthrene	Pyrene	TPH-Diesel (C10-C28)	TPH-Motor Oil (C24-C36)
Direct Exposure Human Health Risk Level Residential Soil Exposure ESL [1]					1.1E+03	1.1E+02	1.1E+03	1.1E+04	1.1E+05	1.1E+02	1.1E+03	--	2.4E+05	3.6E+06	--	1.8E+07	--	2.4E+06	2.4E+06	3.8E+03	--	1.8E+06	2.6E+02	1.2E+04
Leaching to Groundwater Levels Non-drinking Water ESL [2]					1.0E+04	5.7E+03	7.5E+04	3.9E+04	1.0E+04	3.9E+05	3.2E+04	--	8.8E+02	1.2E+04	6.4E+03	1.9E+03	2.7E+04	8.6E+04	6.0E+03	1.2E+03	1.1E+04	4.5E+04	7.3E+03	--
Regional Background [3]					--	--	--	--	--	--	--	9.0E+02	--	--	--	--	--	--	--	--	--	--	--	--
Units					µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	mg/kg	mg/kg
DG-V1	1	3.5-4	DG-V1S-3.5-4	12/17/2018	**4.4 J**	**7.8**	**66**	**5.1**	**84**	**9.5**	**8.4**	**25**	**8.9 J**	<2.8	<2.4	**4.6 J**	**12**	**30**	**4.9 J**	**9.5**	**220**	**22**	**2.8**	<10
DG-V5	1	0.5-1	DG-V5S-0.5-1	1/8/2019	**46**	**62**	**97**	**31**	**77**	**11**	**31**	**91**	**79**	**4.9**	**15**	**30**	**39**	**110**	**3.4**	**61**	**91**	**110**	**48**	**110**
DG-V5	1	3.5-4	DG-V5S-3.5-4	1/8/2019	<1.5	**2**	**3.5**	<2.1	**1.8**	<3.5	<4.2	**4**	<4.9	<2.8	<2.4	<2.0	<4.2	**2.6**	<2.2	<3.5	**2.2**	**3.1**	**1.7**	<9.9
DG-V5	1	7.5-8	DG-V5S-7.5-8	1/8/2019	<1.5	<1.9	<2.1	<2.1	<1.4	<3.4	<4.1	**3**	<4.9	<2.8	<2.4	<2.0	<4.2	<1.4	<2.2	<3.4	<1.8	<1.7	**0.98**	<9.9
DG-V9	1	0.5-1	DG-V9S-0.5-1	1/10/2019	<1.5	<1.9	**2.2 J**	<2.1	**1.8 J**	<3.4	<4.1	**3**	<4.9	<2.7	<2.3	<2.0	<4.2	**2.7 J**	<2.1	<3.4	**2.7 J**	**3.1 J**	**5**	**16 J**
DG-V9	1	3.5-4	DG-V9S-3.5-4	1/10/2019	**2.1 J**	<1.8 R	**11 J**	**2.8 J**	**17 J**	<3.4 UJ	<4.0 UJ	**4**	**20**	<2.7	**4.5 J**	**2.4 J**	<4.1 UJ	**29 J**	**3.0 J**	**130**	**59 J**	**16 J**	**15**	**27 J**
DG-V9	1	7.5-8	DG-V9S-7.5-8	1/10/2019	<1.4	<1.8	<2.0	<2.0	<1.3	<3.4	<4.0	**3**	<4.8	<2.7	<2.3	<1.9	<4.1	<1.3	<2.1	<3.4	<1.7	<1.6	**2.8**	**18 J**
DG-W3	1	0.5-1	DG-W3S-0.5-1	12/18/2018	**27**	**36**	**45**	**21 J**	**25**	<17	<21	**53**	<25	<14	**15 J**	**32**	**25**	**44**	<11	**17 J**	**26**	**55**	**62**	**160**
DG-W3	1	3.5-4	DG-W3S-3.5-4	12/18/2018	**4.8 J**	**7**	**60**	**5.2**	**60**	**6.8**	**7**	**21**	<5.0	<2.8	<2.4	**2.6 J**	**9**	**27**	<2.2	**8.6**	**78**	**19**	**9.4**	**12 J**
DG-W7	1	0.5-1	DG-W7S-0.5-1	1/29/2019	**39**	**57**	**100**	**33**	**36**	**21 J**	**48**	**97**	**42 J**	<14	**29**	**52**	**67**	**66**	<11	**42**	**50**	**63**	**32**	**74**
DG-W7	1	3.5-4	DG-W7S-3.5-4	1/29/2019	**13**	**14**	**43**	**14**	**37**	**7.0 J**	**11**	**28**	**22**	<5.5	**7.4 J**	**7.2 J**	**12**	**59**	<4.3	**69**	**81**	**43**	**35**	**68**
DG-X1	1	0.5-1	DG-X1S-0.5-1	12/17/2018	**810 J**	**1,300 J**	**1,600 J**	**530 J**	**1,400 J**	**270 J**	**770 J**	**1,895**	**190**	<14	**470 J**	**260 J**	**1,100 J**	**1,100 J**	**67 J**	**310**	**600**	**2,600 J**	**95**	**130**
DG-X1 (D)	1	0.5-1	DG-X1 (D)S-0.5-1	12/17/2018	**4,400 J**	**5,200 J**	**6,800 J**	**2,300 J**	**6,100 J**	**1,100 J**	**3,100 J**	**7,759**	**220**	<28	**1,400 J**	**730 J**	**3,900 J**	**2,600 J**	**160 J**	**350**	**1,000**	**6,600 J**	**69**	**120**
DG-X1	1	3.5-4	DG-X1S-3.5-4	12/17/2018	**20**	**3.1 J**	**62**	<2.1	**30**	**3.9 J**	<4.2	**15**	<5.0	<2.8	<2.4	<2.0	<4.3	**11**	<2.2	**5.3**	**30**	**5.1**	**2.9**	<10
DG-X5	1	0.5-1	DG-X5S-0.5-1	1/8/2019	**46**	**61**	**94**	**34**	**73**	**11**	**37**	**90**	**71**	**3.7**	**27**	**70**	**68**	**94**	<2.2	**68**	**140**	**110**	**78**	**190**
DG-X5	1	3.5-4	DG-X5S-3.5-4	1/8/2019	<1.5	<1.9	**2.6**	<2.1	<1.4	<3.4	<4.1	**3**	<4.9	<2.8	<2.4	<2.0	<4.2	**1.6**	<2.2	<3.4	<1.8	**1.8**	**1.3**	<9.9
DG-X9	1	0.5-1	DG-X9S-0.5-1	1/10/2019	**8.4**	**7.9**	**13**	**4.1 J**	**4.3 J**	**3.8 J**	**20**	**16**	**5.3 J**	<2.8	**22**	**47**	**65**	**6.9**	<2.2	**8.9**	**6.5**	**8**	**31**	**74**
DG-X9	1	3.5-4	DG-X9S-3.5-4	1/10/2019	**18**	**10**	**27**	**7.7**	**44**	<3.4	**6.4**	**17**	**120**	<2.7	<2.4	**15**	**8.2**	**69**	**7.8**	**390**	**160**	**52**	**68**	**90**
DG-Y3	1	0.5-1	DG-Y3S-0.5-1	12/18/2018	**210 J**	**300**	**470**	**200 J**	**200 J**	<170	<210	**466**	<250	<140	<120	**140 J**	**230 J**	**410**	<110	<170	**210 J**	**470**	**930**	**1,900**
DG-Y3	1	3.5-4	DG-Y3S-3.5-4	12/18/2018	**2.4 J**	**4.3 J**	**25**	**2.9 J**	**22**	<3.5	<4.2	**9**	<5.0	<2.8	<2.4	<2.0	**5.3**	**11**	<2.2	**7.3**	**35**	**9**	**2.1**	<10
DG-Y7	1	0.5-1	DG-Y7S-0.5-1	1/9/2019	**31**	**32**	**53**	**18**	**47**	**4.6**	**15**	**47**	**11**	**3.7**	**4.4**	**14**	**17**	**70**	**3**	**12**	**49**	**68**	**25**	**43**
DG-Y7	1	3.5-4	DG-Y7S-3.5-4	1/9/2019	**11**	**7.5**	**18**	**6.2**	**29**	<3.4	<4.1	**12**	**22**	<2.7	**4.4**	**6.8**	<4.2	**35**	**3.9**	**73**	**68**	**34**	**59**	**110**
DG-Z5	1	0.5-1	DG-Z5S-0.5-1	1/8/2019	**140**	**190**	**230**	**93**	**180**	**24**	**67**	**259**	**55**	<11	**48**	**61**	**79**	**180**	<8.7	**85**	**93**	**330**	**70**	**190**
DG-Z5	1	3.5-4	DG-Z5S-3.5-4	1/8/2019	<1.5	<1.9	**3.4**	<2.1	**1.8**	<3.5	<4.2	**3**	<5.0	<2.8	<2.4	<2.0	<4.3	**2.2**	<2.2	<3.5	**2.5**	**2.4**	**5.6**	**12**
DG-Z9	1	0.5-1	DG-Z9S-0.5-1	1/9/2019	**39**	**50**	**93**	**29**	**45**	<17	**23**	**74**	<24	<13	**24**	**41**	**33**	**56**	<10	**21**	**30**	**65**	**100**	**190**
DG-Z9 (D)	1	0.5-1	DG-Z9 (D)S-0.5-1	1/9/2019	**19**	**21**	**38**	**12**	**27**	<6.8	**14**	**32**	<9.8	<5.5	**12**	**22**	**27**	**59**	<4.3	**11**	**31**	**52**	**62**	**130**
DG-Z9	1	3.5-4	DG-Z9S-3.5-4	1/9/2019	**4**	<1.8	**19**	**4**	**29**	<3.4	<4.1	**5**	**15**	<2.7	<2.3	**2.6**	<4.2	**29**	**2.1**	**41**	**56**	**17**	**31**	**58**
DG-AA3	1	0.5-1	DG-AA3S-0.5-1	12/18/2018	**80**	**100**	**150**	**62**	**99**	**15**	**42**	**143**	**31 J**	<5.6	**17**	**31**	**57 J**	**130**	<4.4	**24 J**	**67 J**	**160**	**76**	**150**
DG-AA3 (D)	1	0.5-1	DG-AA3 (D)S-0.5-1	12/18/2018	**74**	**98**	**130**	**53**	**100**	**18 J**	**65**	**144**	**53 J**	<14	**23 J**	**47**	**270 J**	**150**	<11	**47 J**	**130 J**	**220**	**97**	**180**
DG-AA3	1	3.5-4	DG-AA3S-3.5-4	12/18/2018	**2.2 J**	**4.1 J**	**7.6**	**2.9 J**	**4.1 J**	<3.5	<4.2	**7**	<5.0	<2.8	<2.4	<2.0	**4.3 J**	**3.6 J**	<2.2	<3.5	**8.5**	**5**	**2.0 U**	**14 J**
DG-AA3	1	7-7.5	DG-AA3S-7-7.5	12/18/2018	**7**	**2.4 J**	**20**	**2.2 J**	**8.8**	<3.5	<4.2	**7**	**11**	<2.8	<2.4	<2.0	**4.8 J**	**6.4**	**16**	**6.9**	**24**	**19**	**2**	<10
DG-AA7	1	0.5-1	DG-AA7S-0.5-1	1/9/2019	**44**	**58**	**130**	**41**	**63**	<17	**42**	**89**	<25	<14	**51**	**240**	**64**	**74**	<11	**21**	**50**	**85**	**45**	**130**
DG-AA7	1	3.5-4	DG-AA7S-3.5-4	1/9/2019	**4.2**	**3.6**	**7.4**	**2.8**	**6.2**	<3.3	<4.0	**7**	<4.7	<2.7	<2.3	**3.4**	<4.1	**8.1**	<2.1	<3.3	**7.6**	**9.6**	**14**	**38**
DG-AB5	1	0.5-1	DG-AB5S-0.5-1	1/29/2019	**550 J**	**770 J**	**740 J**	**290 J**	**600 J**	**81 J**	**250 J**	**1,009**	**79 J**	<14	**130 J**	**56 J**	**290 J**	**480 J**	<11	**100 J**	**140 J**	**1,000 J**	**51**	**150**
DG-AB5 (D)	1	0.5-1	DG-AB5 (D)S-0.5-1	1/29/2019	**53 J**	**84 J**	**99 J**	**36 J**	**56 J**	**18 J**	**40 J**	**122**	**26 J**	<14	**23 J**	**21 J**	**49 J**	**91 J**	<11	**22 J**	**42 J**	**120 J**	**38**	**91**
DG-AB5	1	3.5-4	DG-AB5S-3.5-4	1/29/2019	**5.6**	**12**	**16**	**6.6**	**8**	**3.9 J**	**8.7**	**19**	<4.9	<2.7	<2.3	**2.2 J**	**11**	**12**	<2.1	<3.4	**6.3**	**13**	**6.8**	**24 J**
DG-AB9	1	0.5-1	DG-AB9S-0.5-1	1/30/2019	**5.4 J**	**4.3 J**	**10 J**	<4.0	**14 J**	<4.0	**4.0 J**	**8**	**15 J**	<4.0	<4.0	<4.0	**4.1 J**	**15 J**	<4.0	**18 J**	**26 J**	**10 J**	**21**	**22**
DG-AB9	1	3.5-4	DG-AB9S-3.5-4	1/30/2019	**16 J**	**22 J**	**32**	**10 J**	**23 J**	**5.7 J**	**32**	**36**	**26 J**	<3.9	**13 J**	**28 J**	**39**	**19 J**	<3.9	**22 J**	**21 J**	**21 J**	**8.9**	**11**
DG-AC3	1	0.5-1	DG-AC3S-0.5-1	12/19/2018	**50**	**68**	**110**	**44**	**74**	**11 J**	**28 J**	**98**	**33**	**3.0 J**	**16**	**27**	**33 J**	**78**	**2.9 J**	**22**	**58**	**100**	**72**	**170**
DG-AC3	1	3.5-4	DG-AC3S-3.5-4	12/19/2018	<1.5	**3.0 J**	**7.1**	**2.2 J**	**3.6 J**	<3.5	<4.2	**6**	**10 U**	<2.8	<2.4	<2.0	<4.3	**2.9 J**	<2.2	**5.2**	**12**	**3.7 J**	**4**	**15 J**
DG-AC7	1	0.5-1	DG-AC7S-0.5-1	1/9/2019	**330**	**500**	**1,100**	**330**	**480**	**72**	**240**	**743**	<24	**16**	**170**	**360**	**280**	**620**	**17**	**28**	**110**	**830**	**85**	**210**
DG-AC7 (D)	1	0.5-1	DG-AC7 (D)S-0.5-1	1/9/2019	**96**	**200**	**430**	**130**	**170**	**27**	**92**	**290**	**45**	<14	**82**	**190**	**100**	**160**	<11	**43**	**62**	**220**	**75**	**180**
DG-AC7	1	3.5-4	DG-AC7S-3.5-4	1/9/2019	**5.3**	**2.5**	**11**	**2.8**	**19**	<3.4	<4.1	**6**	**11**	<2.8	**2.9**	**5.3**	<4.2	**27**	<2.2	**41**	**51**	**17**	**28**	**37**
DG-AC7	1	7.5-8	DG-AC7S-7.5-8	1/9/2019	**9.3**	**17**	**54**	**9.3**	**30**	<3.4	**14**	**27**	**16**	<2.7	**5.9**	**3.2**	**20**	**43**	**5.8**	**42**	**49**	**41**	**9.2**	**25**

Table 3: Polynuclear Aromatic Hydrocarbons and TPH as Diesel and Motor Oil Concentrations in Soil
Brisbane Baylands OU-2
Brisbane, California

Sample Location	Investigation Zone	Depth Range (ft bgs)	Sample Name	Collection Date	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Chrysene	Dibenzo(a,h)anthracene	Indeno(1,2,3-cd)pyrene	Benzo(a)pyrene Equivalent Total PAHs [4]	2-Methylnaphthalene	Acenaphthene	Acenaphthylene	Anthracene	Benzo(g,h,i)perylene	Fluoranthene	Fluorene	Naphthalene	Phenanthrene	Pyrene	TPH-Diesel (C10-C28)	TPH-Motor Oil (C24-C36)
Direct Exposure Human Health Risk Level Residential Soil Exposure ESL [1]					1.1E+03	1.1E+02	1.1E+03	1.1E+04	1.1E+05	1.1E+02	1.1E+03	--	2.4E+05	3.6E+06	--	1.8E+07	--	2.4E+06	2.4E+06	3.8E+03	--	1.8E+06	2.6E+02	1.2E+04
Leaching to Groundwater Levels Non-drinking Water ESL [2]					1.0E+04	5.7E+03	7.5E+04	3.9E+04	1.0E+04	3.9E+05	3.2E+04	--	8.8E+02	1.2E+04	6.4E+03	1.9E+03	2.7E+04	8.6E+04	6.0E+03	1.2E+03	1.1E+04	4.5E+04	7.3E+03	--
Regional Background [3]					--	--	--	--	--	--	--	9.0E+02	--	--	--	--	--	--	--	--	--	--	--	--
Units					µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	mg/kg	mg/kg
DG-AD5	1	0.5-1	DG-AD5S-0.5-1	1/8/2019	**51**	**64**	**80**	**37**	**92**	<14	**34**	**88**	**92**	<11	**53**	**77**	**54**	**100**	**20**	**340**	**130**	**140**	**310**	**550**
DG-AD5	1	3.5-4	DG-AD5S-3.5-4	1/8/2019	<1.5	**2.5**	**4.8**	<2.1	**3.3**	<3.4	<4.1	**5**	<4.9	<2.8	<2.4	<2.0	**4.4**	**4.6**	<2.2	**3.6**	**3.6**	**6.3**	**15**	**35**
DG-AD9	1	0.5-1	DG-AD9S-0.5-1	1/9/2019	**120**	**180**	**260**	**91**	**190**	**24**	**84**	**252**	**120**	**21**	**56**	**110**	**110**	**220**	**12**	**130**	**150**	**250**	**510**	**1,200**
DG-AD9	1	3.5-4	DG-AD9S-3.5-4	1/9/2019	**18**	**11**	**36**	**10**	**41**	<3.3	**6.2**	**19**	**58**	**3.1**	<2.3	**27**	**8.5**	**81**	**9.4**	**170**	**190**	**60**	**110**	**150**
DG-AE3	1	0.5-1	DG-AE3S-0.5-1	12/19/2018	<1.5	**2.8 J**	**5.0 U**	<2.1	<1.4	<3.5	<4.2	**5**	<5.0	<2.8	<2.4	<2.0	<4.3	**2.0 J**	<2.2	<3.5	<1.8	**2.3 J**	**3**	**13 J**
DG-AE3	1	3.5-4	DG-AE3S-3.5-4	12/19/2018	**34**	**47**	**60**	**21**	**45**	**10**	**35**	**70**	**23**	<2.8	**8.4**	**10**	**44**	**72**	**3.2 J**	**20**	**49**	**83**	**24**	**69**
DG-AE7	1	0.5-1	DG-AE7S-0.5-1	1/9/2019	**25**	**36**	**53**	**22**	**42**	**4.4**	**15**	**50**	**5.4**	<2.6	**2.4**	**4.2**	**18**	**40**	<2.1	**4.9**	**18**	**42**	**21**	**47**
DG-AE7	1	3.5-4	DG-AE7S-3.5-4	1/9/2019	**18**	**18**	**27**	**9.6**	**28**	<3.4	**6.6**	**25**	**13**	<2.7	**3.4**	**4.9**	**8.1**	**20**	**2.9**	**14**	**23**	**30**	**27**	**140**
DG-AE7	1	8-8.5	DG-AE7S-8-8.5	1/9/2019	**14**	**28**	**58**	**17**	**39**	**4.2**	**19**	**42**	**5.1**	<2.6	**2.3**	**3**	**26**	**42**	**2.3**	**15**	**47**	**52**	**6.2**	<9.7
DG-AF5	1	0.5-1	DG-AF5S-0.5-1	1/8/2019	**130**	**160**	**260**	**91**	**210**	**32**	**96**	**242**	**64**	**22**	**60**	**150**	**130**	**240**	**14**	**77**	**190**	**270**	**300**	**640**
DG-AF5	1	3.5-4	DG-AF5S-3.5-4	1/8/2019	<1.5	**2.9**	**4.7**	<2.1	**3.1**	<3.4	<4.1	**5**	<4.9	<2.7	<2.4	<2.0	**4.7**	**3.9**	<2.2	<3.4	**2.8**	**5**	**11**	**35**
DG-AG3	1	0.5-1	DG-AG3S-0.5-1	12/19/2018	**8.5**	**12**	**17**	**6.8**	**13**	**3.8 J**	**9.7**	**19**	<5.0	<2.8	**2.5 J**	**6.3**	**18**	**18**	<2.2	**4.3 J**	**9.3**	**19**	**11**	**45 J**
DG-AG3	1	3.5-4	DG-AG3S-3.5-4	12/19/2018	**3.8 J**	**7.7**	**11**	**3.6 J**	**7.1**	<3.5	**4.4 J**	**11**	<5.0	<2.8	<2.4	<2.0	**7.4**	**7.3**	<2.2	<3.5	**8.8**	**20**	**210**	**690**
DG-AG7	1	0.5-1	DG-AG7S-0.5-1	1/30/2019	**15 J**	**24 J**	**35**	**11 J**	**24 J**	**4.4 J**	**20 J**	**36**	**5.7 J**	<3.9	**3.9 J**	**8.4 J**	**27 J**	**24 J**	<3.9	**6.1 J**	**16 J**	**26 J**	**20**	**18**
DG-AG7	1	3.5-4	DG-AG7S-3.5-4	1/30/2019	**4.2 J**	**4.9 J**	**9.6 J**	<4.0	**7.5 J**	<4.0	<4.0	**9**	<4.0	<4.0	<4.0	<4.0	**4.1 J**	**8.1 J**	<4.0	<4.0	**5.4 J**	**8.1 J**	**5.4**	**4.9**
DG-AH4	1	4-4.5	DG-AH4S-4-4.5	12/18/2018	**2,700**	**1,600**	**940**	**350 J**	**4,200**	<350	<420	**2,168**	**20,000**	**3100**	**460 J**	**4,600**	**510**	**1,900**	**3,400**	**1,100**	**14,000**	**9,200**	**3,700**	**3,600**
DG-AH4	1	6-6.5	DG-AH4S-6-6.5	12/18/2018	**3.6 J**	**7.2**	**21**	**3.9 J**	**20**	**4.2 J**	**6.5**	**15**	**11**	<2.8	<2.4	**3.1 J**	**12**	**13**	<2.2	**19**	**46**	**15**	**13**	**34 J**
DG-AH5	1	0.5-1	DG-AH5S-0.5-1	1/8/2019	**55**	**79**	**90**	**40**	**81**	**9.3**	**35**	**107**	**24**	**3**	**12**	**30**	**46**	**130**	**3.4**	**27**	**77**	**150**	**58**	**160**
DG-AH5	1	3.5-4	DG-AH5S-3.5-4	1/8/2019	**430**	**880**	**820**	**360**	**670**	**54**	**350**	**1,098**	**130**	<14	**140**	**170**	**370**	**1,900**	**55**	**660**	**1,500**	**2,300**	**130**	**340**
DG-AH5	1	8-8.5	DG-AH5S-8-8.5	1/8/2019	<1.5	**2.8**	**4.7**	<2.1	**3.1**	<3.4	<4.1	**5**	<4.9	<2.8	<2.4	<2.0	**5.8**	**3.8**	<2.2	<3.4	**3.3**	**4.7**	**18**	**28**
DG-AH9	2	0.5-1	DG-AH9S-0.5-1	1/30/2019	**22 J**	**30**	**41**	**15 J**	**28 J**	**5.4 J**	**25 J**	**44**	**7.4 J**	<3.9	**6.1 J**	**22 J**	**39**	**35**	<3.9	**6.3 J**	**21 J**	**34**	**9.3**	**11**
DG-AH9	2	3.5-4	DG-AH9S-3.5-4	1/30/2019	**25 J**	**24 J**	**42**	**13 J**	**37**	**5.2 J**	**18 J**	**38**	**29**	<3.9	**4.7 J**	**16 J**	**18 J**	**48**	**6.8 J**	**36**	**50**	**36**	**13**	**13**
DG-AI3	2	0.5-1	DG-AI3S-0.5-1	12/19/2018	**1.7 J**	**3.5 J**	**5.9**	**2.5 J**	**1.5 J**	<3.5	<4.2	**6**	<5.0	<2.8	<2.4	**2.3 J**	<4.3	**3.0 J**	<2.2	<3.5	<1.8	**3.3 J**	**5.1**	**13 J**
DG-AI3	2	3.5-4	DG-AI3S-3.5-4	12/19/2018	**3.4 J**	**5.5 J**	**35**	**4.8 UJ**	**32**	**5.1**	**5.8 J**	**15**	**55**	<2.7 UJ	<2.3 UJ	**7.4**	**14**	**9.0 J**	**19**	**7.6 J**	**55**	**22**	**20 J**	**47 J**
DG-AI3 (D)	2	3.5-4	DG-AI3 (D)S-3.5-4	12/19/2018	**7.7 J**	**9.4 J**	**36**	**6.2 J**	**32**	**5.4**	**10 J**	**20**	**54**	**3.1 J**	**2.4 J**	**10**	**20**	**17 J**	**20**	**14 J**	**56**	**28**	**38 J**	**74 J**
DG-AI7	2	0.5-1	DG-AI7S-0.5-1	1/9/2019	**350**	**440**	**690**	**210**	**600**	**51**	**150**	**613**	**85**	**32**	**41**	**120**	**180**	**640**	**28**	**80**	**420**	**770**	**440**	**980**
DG-AI7	2	3.5-4	DG-AI7S-3.5-4	1/9/2019	**20**	**9.2**	**21**	**7.8**	**35**	<3.3	**7**	**16**	**15**	<2.7	<2.3	**5.8**	**10**	**24**	**2.5**	**14**	**16**	**27**	**25**	**75**
DG-AI7	2	8-8.5	DG-AI7S-8-8.5	1/9/2019	**660**	**800**	**990**	**400**	**800**	**76**	**230**	**1,069**	**250**	**41**	**70**	**260**	**220**	**980**	**110**	**510**	**1,000**	**1,200**	**220**	**330**
DG-AJ5	2	0.5-1	DG-AJ5S-0.5-1	1/8/2019	**44**	**64**	**100**	**42**	**77**	**11**	**29**	**93**	**17**	**6.6**	**18**	**38**	**37**	**76**	<4.3	**18**	**44**	**79**	**51**	**160**
DG-AJ5	2	3.5-4	DG-AJ5S-3.5-4	1/8/2019	**380**	**430**	**610**	**250**	**610**	**36**	**120**	**580**	**670**	**81**	**100**	**260**	**130**	**960**	**100**	**630**	**1,000**	**1,100**	**600**	**1,600**
DG-AJ9	2	0.5-1	DG-AJ9S-0.5-1	1/30/2019	**40**	**44**	**67**	**20 J**	**60**	**7.8 J**	**37**	**66**	**18 J**	**4.1 J**	**12 J**	**28 J**	**57**	**86**	**4.8 J**	**20 J**	**66**	**88**	**71**	**73**
DG-AJ9	2	3.5-4	DG-AJ9S-3.5-4	1/30/2019	**13 J**	**8.3 J**	**22 J**	**5.9 J**	**24 J**	<3.9	**7.0 J**	**15**	**34**	<3.9	<3.9	**12 J**	**8.3 J**	**23 J**	**5.6 J**	**26 J**	**36**	**18 J**	**7.1**	**8.4**
DG-AK3	2	0.5-1	DG-AK3S-0.5-1	12/19/2018	**2.6 J**	**3.7 J**	**5.6**	**2.5 J**	**2.6 J**	<3.5	<4.2	**7**	**6.0 J**	<2.8	<2.4	<2.0	<4.3	**3.6 J**	<2.2	**3.5 J**	**5.2**	**3.4 J**	**14**	**32 J**
DG-AK3	2	3.5-4	DG-AK3S-3.5-4	12/19/2018	**260**	**290**	**350**	**110**	**280**	**42**	**110**	**405**	**150**	**18**	**83**	**110**	**120**	**410**	**43**	**120**	**400**	**490**	**27**	**45 J**
DG-AK7	2	0.5-1	DG-AK7S-0.5-1	1/9/2019	**200**	**280**	**430**	**180**	**310**	**35**	**100**	**390**	**45**	**15**	**29**	**53**	**120**	**310**	**12**	**45**	**210**	**370**	**200**	**360**
DG-AK7	2	3.5-4	DG-AK7S-3.5-4	1/9/2019	**7.1**	**4.8**	**11**	**3.4**	**12**	<3.4	<4.1	**9**	**22**	<2.7	**3.2**	**5.9**	<4.2	**19**	**2.9**	**26**	**33**	**18**	**36**	**72**
DG-AK7 (D)	2	3.5-4	DG-AK7 (D)S-3.5-4	1/9/2019	**8**	**5.7**	**12**	**3.5**	**13**	<3.4	<4.0	**10**	**46**	<2.7	**2.5**	**5.1**	<4.1	**12**	**2.1**	**35**	**21**	**14**	**17**	**56**
DG-AL5	2	0.5-1	DG-AL5S-0.5-1	1/30/2019	**26 J**	**28 J**	**45**	**14 J**	**34**	**5.3 J**	**25 J**	**43**	**32**	<3.9	**16 J**	**46**	**35**	**47**	**3.9 J**	**63**	**49**	**42**	**15**	**21**
DG-AL5	2	3.5-4	DG-AL5S-3.5-4	1/30/2019	**60 J**	**74 J**	**140 J**	**42 J**	**130 J**	**17 J**	**59 J**	**117**	**28 J**	<16	**22 J**	**68 J**	**93 J**	**110 J**	<16	**38 J**	**76 J**	**130 J**	**110 J**	**200 J**
DG-AL5 (D)	2	3.5-4	DG-AL5 (D)S-3.5-4	1/30/2019	**23 J**	**26 J**	**44 J**	**14 J**	**41 J**	<8.0 UJ	**20 J**	**39**	**19 J**	<8.0	**11 J**	**31 J**	**35 J**	**51 J**	<8.0	**21 J**	**44 J**	**51 J**	**38 J**	**64 J**
DG-AL9	2	0.5-1	DG-AL9S-0.5-1	1/21/2019	**40**	**54**	**78**	**25**	**62**	**9.9**	**34**	**79**	**9.7**	**3.0 J**	**4.6 J**	**12**	**60**	**65**	<2.1	**10**	**28**	**69**	**36**	**91**
DG-AL9	2	3.5-4	DG-AL9S-3.5-4	1/21/2019	**18**	**13**	**34**	**8.2**	**36**	**6**	**10**	**25**	**59**	**2.7 J**	**6.6**	**12**	**14**	**38**	**4.3 J**	**82**	**64**	**47**	**53**	**98**
DG-AL9	2	7-7.5	DG-AL9S-7-7.5	1/21/2019	**3.4 J**	**6.5**	**59**	**4.7 J**	**36**	**5.3**	**6.3**	**19**	<4.8	<2.7	<2.3	**3.8 J**	**7.1**	**20**	**3.1 J**	**6.7 J**	**60 J**	**29**	**1.4 J**	<9.5
DG-AL9 (D)	2	7-7.5	DG-AL9 (D)S-7-7.5	1/21/2019	**3.5 J**	**8.5**	**71**	**5.3 J**	**35**	**5**	**6.6**	**22**	<4.8	<2.7	<2.3	**3.0 J**	**7.5**	**22**	<2.1 UJ	**4.4 J**	**35 J**	**30**	**2.7 J**	<9.7

Table 3: Polynuclear Aromatic Hydrocarbons and TPH as Diesel and Motor Oil Concentrations in Soil
Brisbane Baylands OU-2
Brisbane, California

Sample Location	Investigation Zone	Depth Range (ft bgs)	Sample Name	Collection Date	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Chrysene	Dibenzo(a,h)anthracene	Indeno(1,2,3-cd)pyrene	Benzo(a)pyrene Equivalent Total PAHs [4]	2-Methylnaphthalene	Acenaphthene	Acenaphthylene	Anthracene	Benzo(g,h,i)perylene	Fluoranthene	Fluorene	Naphthalene	Phenanthrene	Pyrene	TPH-Diesel (C10-C28)	TPH-Motor Oil (C24-C36)
Direct Exposure Human Health Risk Level Residential Soil Exposure ESL [1]					1.1E+03	1.1E+02	1.1E+03	1.1E+04	1.1E+05	1.1E+02	1.1E+03	--	2.4E+05	3.6E+06	--	1.8E+07	--	2.4E+06	2.4E+06	3.8E+03	--	1.8E+06	2.6E+02	1.2E+04
Leaching to Groundwater Levels Non-drinking Water ESL [2]					1.0E+04	5.7E+03	7.5E+04	3.9E+04	1.0E+04	3.9E+05	3.2E+04	--	8.8E+02	1.2E+04	6.4E+03	1.9E+03	2.7E+04	8.6E+04	6.0E+03	1.2E+03	1.1E+04	4.5E+04	7.3E+03	--
Regional Background [3]					--	--	--	--	--	--	--	9.0E+02	--	--	--	--	--	--	--	--	--	--	--	--
Units					µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	mg/kg	mg/kg
DG-AM3	2	0.5-1	DG-AM3S-0.5-1	12/19/2018	**160**	**350**	**390**	**160**	**240**	**210**	**1,100**	**727**	<99	<56	**550**	**550**	**3,100**	**150**	<44	<70	**98 J**	**210**	**310**	**780**
DG-AM3	2	3.5-4	DG-AM3S-3.5-4	12/19/2018	**12**	**15**	**33**	**8.6**	**27**	**5.4**	**12**	**26**	**31**	<2.8	**3.3 J**	**6.5**	**17**	**22**	<2.2	**23**	**29**	**31**	**65**	**130**
DG-AM7	2	0.5-1	DG-AM7S-0.5-1	1/9/2019	**210**	**260**	**360**	**160**	**240**	**25**	**85**	**352**	**54**	**16**	**93**	**120**	**120**	**300**	**13**	**66**	**190**	**570**	**170**	**440**
DG-AM7	2	3.5-4	DG-AM7S-3.5-4	1/9/2019	**6.6**	**5.2**	**14**	**5**	**13**	<3.4	**7.1**	**10**	**27**	<2.7	**2.4**	**7.9**	**11**	**14**	**3.8**	**25**	**26**	**12**	**16**	**66**
DG-AM7	2	7.5-8	DG-AM7S-7.5-8	1/9/2019	**13**	**40**	**66**	**18**	**30**	**16**	**55**	**70**	**55**	<2.8	**5.5**	**9.2**	**80**	**34**	**11**	**90**	**88**	**39**	**42**	**67**
DG-AN5	2	0.5-1	DG-AN5S-0.5-1	12/20/2018	**11**	**13**	**20**	**6.7**	**11**	<3.5	**6.1**	**19**	<5.0	<2.8	<2.4	**4.2 J**	**7.3**	**23**	<2.2	**4.4 J**	**15**	**20**	**13**	**41 J**
DG-AN5	2	3.5-4	DG-AN5S-3.5-4	12/20/2018	**2.0 J**	**3.6 J**	**5.0 U**	**2.5 J**	**2.0 J**	<3.5	<4.2	**6**	<5.0	<2.8	<2.4	<2.0	<4.3	**4.1 J**	<2.2	<3.5	**2.9 J**	**4.4 J**	**15**	**36 J**
DG-AN9	2	0.5-1	DG-AN9S-0.5-1	1/21/2019	**44**	**75**	**91**	**29**	**46**	**14**	**39**	**107**	**15**	**4.0 J**	**5.7**	**13**	**60**	**48**	<2.1	**13**	**26**	**59**	**43**	**91**
DG-AN9	2	3.5-4	DG-AN9S-3.5-4	1/21/2019	<1.5	**2.8 J**	**3.5 J**	**2.5 J**	<1.4	<3.5	<4.2	**5**	<4.9	<2.8	<2.4	<2.0	<4.3	**2.5 J**	<2.2	<3.5	<1.8	**2.9 J**	**0.92 J**	<9.7
DG-AN9	2	7-7.5	DG-AN9S-7-7.5	1/21/2019	<1.4	**3.0 J**	**31**	**3.5 J**	**20**	**4.2 J**	<4.0	**11**	<4.8	<2.7	<2.3	**3.3 J**	**4.1 J**	**11**	**2.3 J**	**5.1**	**46**	**9.5**	**2**	<9.5
DG-AO3	2	0.5-1	DG-AO3S-0.5-1	12/19/2018	**23**	**28**	**60**	**22**	**37**	**7**	**15**	**45**	**40**	<2.8	**11**	**19**	**17**	**52**	<2.2	**40**	**39**	**53**	**42**	**89**
DG-AO3	2	3.5-4	DG-AO3S-3.5-4	12/19/2018	**7.9**	**8.6**	**29**	**4.9 J**	**23**	**5.5**	**8**	**19**	**16**	<2.8	**2.5 J**	**6.8**	**12**	**18**	**2.5 J**	**12**	**30**	**27**	**23**	**47 J**
DG-AO7	2	0.5-1	DG-AO7S-0.5-1	1/9/2019	**93**	**140**	**160**	**72**	**140**	**25**	**87**	**200**	**20**	**29**	**23**	**35**	**120**	**170**	**7.1**	**20**	**97**	**200**	**38**	**110**
DG-AO7	2	3.5-4	DG-AO7S-3.5-4	1/9/2019	**7.7**	**9.6**	**15**	**5.8**	**12**	<3.4	**6.2**	**14**	**13**	<2.7	<2.3	**2.6**	**8.2**	**13**	<2.1	**9.4**	**8.8**	**12**	**44**	**150**
DG-AP5	2	0.5-1	DG-AP5S-0.5-1	12/20/2018	**16**	**19**	**33**	**11**	**21**	**4.2 J**	**8.9**	**29**	**340**	**3.4 J**	**7.4**	**13**	**12**	**33**	<2.2	**240**	**66 J**	**35**	**70**	**220**
DG-AP5	2	3.5-4	DG-AP5S-3.5-4	12/20/2018	**5.6**	**6.7**	**8.8**	**3.9 J**	**4.6 J**	<3.5	**4.4 J**	**10**	<5.0	<2.8	<2.4	<2.0	**6**	**7.6**	<2.2	<3.5	**4.4 J**	**8.2**	**5.3**	**11 J**
DG-AP9	2	0.5-1	DG-AP9S-0.5-1	1/21/2019	**6.9**	**7.5**	**12**	**4.7 J**	**6.2**	**3.8 J**	**5.6**	**14**	<4.8	<2.7	<2.3	**3.2 J**	**6.2**	**11**	<2.1	<3.4	**5.7**	**10**	**11**	**27 J**
DG-AP9	2	3.5-4	DG-AP9S-3.5-4	1/21/2019	<1.5	**2.8 J**	**4.4 J**	**2.6 J**	**1.7 J**	<3.4	<4.1	**5**	<4.9	<2.7	<2.4	<2.0	<4.2	**3.2 J**	<2.2	<3.4	**2.9 J**	**4.0 J**	**2.6**	<9.9
DG-AQ3	2	0.5-1	DG-AQ3S-0.5-1	12/19/2018	<1.5	**3.5 J**	**5.0 U**	**2.1 J**	**1.5 J**	<3.5	<4.2	**6**	<5.0	<2.8	<2.4	<2.0	<4.3	**2.4 J**	<2.2	<3.5	<1.8	**4.5 J**	**3**	**11 J**
DG-AQ3	2	3.5-4	DG-AQ3S-3.5-4	12/19/2018	**30**	**24**	**54**	**11**	**54**	**10**	**14**	**44**	**5.6 J**	**6.3**	<2.4	**16**	**18**	**58**	**5.8**	**5.2**	**79**	**80**	**5.5**	**15 J**
DG-AQ7	2	0.5-1	DG-AQ7S-0.5-1	1/30/2019	**7.1 J**	**6.6 J**	**11 J**	<3.9	**11 J**	<3.9	<3.9	**11**	**65**	<3.9	<3.9	<3.9	**4.9 J**	**11 J**	<3.9	**49**	**20 J**	**14 J**	**6.2**	**6.5**
DG-AQ7	2	3.5-4	DG-AQ7S-3.5-4	1/30/2019	**7.1 J**	**5.2 J**	**12 J**	<3.9	**14 J**	<3.9	**4.3 J**	**10**	**27 J**	<3.9	<3.9	<3.9	**4.8 J**	**16 J**	<3.9	**25 J**	**24 J**	**14 J**	**7.4**	**9.3**
DG-AR5	2	0.5-1	DG-AR5S-0.5-1	12/20/2018	<1.5	**2.2 J**	**5.0 U**	<2.1	<1.4	<3.5	<4.2	**5**	<5.0	<2.8	<2.4	<2.0	<4.3	**2.5 J**	<2.2	<3.5	**2.7 J**	**2.7 J**	**1.5 J**	<10
DG-AR5	2	3.5-4	DG-AR5S-3.5-4	12/20/2018	**23**	**31**	**39**	**16**	**26**	**6.3**	**14**	**45**	**5.2 J**	<2.8	**6.5**	**7.5**	**15**	**35**	**2.6 J**	**5.1**	**21**	**42**	**16**	**43 J**
DG-AR9	2	0.5-1	DG-AR9S-0.5-1	1/9/2019	**71**	**84**	**150**	**45**	**110**	<17	**57**	**121**	**39**	<13	**58**	**120**	**99**	**110**	<11	**58**	**70**	**130**	**180**	**440**
DG-AR9	2	3.5-4	DG-AR9S-3.5-4	1/9/2019	**4.3**	**4.3**	**10**	**3.3**	**11**	<3.4	<4.1	**8**	<4.8	<2.7	<2.3	**3.2**	**4.8**	**8.6**	<2.1	**5.8**	**9.9**	**8.4**	**15**	**52**
DG-AR9 (D)	2	3.5-4	DG-AR9 (D)S-3.5-4	1/9/2019	**4.8**	**6.8**	**12**	**4.6**	**8.9**	<3.3	<4.0	**10**	<4.8	<2.7	<2.3	**2.4**	**6**	**8.4**	<2.1	**3.9**	**8.4**	**9.5**	**47**	**240**
DG-AS3	2	0.5-1	DG-AS3S-0.5-1	12/20/2018	**9.3**	**12**	**19**	**7.4**	**12**	**4.0 J**	**9.4**	**20**	**6.8 J**	<2.8	**2.5 J**	**5.6**	**11**	**16 J**	<2.2	**5.6 J**	**9.9 J**	**15**	**24**	**60**
DG-AS3 (D)	2	0.5-1	DG-AS3 (D)S-0.5-1	12/20/2018	**15**	**16**	**26**	**11**	**19**	**4.1 J**	**9.9**	**25**	**11 J**	<2.8	**2.9 J**	**7.5**	**11**	**27 J**	<2.2	**12 J**	**18 J**	**25**	**25**	**65**
DG-AS3	2	3.5-4	DG-AS3S-3.5-4	12/20/2018	**270**	**400**	**360**	**180**	**260**	**110**	**230**	**598**	**98**	**26**	**30**	**180**	**240**	**430**	**40**	**74**	**370**	**530**	**110**	**240**
DG-AS3	2	4.5-5	DG-AS3S-4.5-5	12/20/2018	**6.5 J**	**16**	**25**	**8.5 J**	**13**	<6.9	<8.2	**23**	<9.8	<5.5	**5.0 J**	**4.4 J**	**9.1 J**	**8.5 J**	<4.3	**15**	**18 J**	**52**	**160**	**230**
DG-AS7	2	0.5-1	DG-AS7S-0.5-1	1/9/2019	**12,000**	**7,900**	**13,000**	**5,000**	**14,000**	**980**	**2,200**	**11,664**	<190	**1,000**	**130**	**3,800**	**2,000**	**29,000**	**1,000**	<140	**25,000**	**26,000**	**120**	**310**
DG-AS7	2	3.5-4	DG-AS7S-3.5-4	1/9/2019	**1.6**	**1.9**	**2.9**	<2.0	**3.6**	<3.4	<4.1	**4**	**6.7**	<2.7	<2.3	<1.9	<4.2	**4.7**	<2.1	**5**	**8.8**	**4.4**	**8.4**	**23**
DG-AT5	2	0.5-1	DG-AT5S-0.5-1	12/20/2018	<1.5	**2.3 J**	**5.0 U**	<2.1	<1.4	<3.5	<4.2	**5**	<5.0	<2.8	<2.4	<2.0	<4.3	<1.4	<2.2	<3.5	<1.8	<1.7	**3**	**11 J**
DG-AT5	2	3.5-4	DG-AT5S-3.5-4	12/20/2018	**220**	**240**	**280**	**97**	**260**	**45**	**120**	**348**	**13**	**11**	**43**	**37**	**110**	**350**	**14**	**21**	**230**	**470**	**16**	**42 J**
DG-AU3	2	0.5-1	DG-AU3S-0.5-1	12/20/2018	**90**	**160**	**240**	**89**	**120**	**23**	**59**	**223**	**15 J**	<5.6	**24**	**41**	**62**	**49**	<4.4	**21**	**29**	**58**	**41**	**110**
DG-AU3	2	3.5-4	DG-AU3S-3.5-4	12/20/2018	**68**	**98**	**110**	**48**	**87**	**19**	**58**	**141**	**45**	**5.1**	**13**	**17**	**69**	**83**	**13**	**23**	**91**	**110**	**140**	**160**
DG-AU7	2	0.5-1	DG-AU7S-0.5-1	1/9/2019	**17**	**27**	**44**	**16**	**25**	**4.7**	**16**	**40**	**15**	**2.8**	**18**	**54**	**26**	**33**	**2.4**	**22**	**28**	**38**	**94**	**360**
DG-AU7 (D)	2	0.5-1	DG-AU7 (D)S-0.5-1	1/9/2019	**43**	**50**	**83**	**34**	**56**	<16	**34**	**74**	**34**	<13	**31**	**88**	**49**	**74**	<10	**59**	**58**	**71**	**110**	**280**
DG-AU7	2	3.5-4	DG-AU7S-3.5-4	1/9/2019	**5.7**	**3.6**	**18**	**4.1**	**20**	<3.4	<4.1	**8**	**13**	<2.8	<2.4	**7.3**	<4.2	**29**	<2.2	**42**	**63**	**18**	**31**	**52**
DG-AV5	2	0.5-1	DG-AV5S-0.5-1	12/20/2018	**120 J**	**130 J**	**210 J**	**89 J**	**150 J**	**20 J**	**59 J**	**190**	**110**	**8.7 J**	**34 J**	**92 J**	**120 J**	**210 J**	**6.8 J**	**87 J**	**160 J**	**220 J**	**120 J**	**280 J**
DG-AV5 (D)	2	0.5-1	DG-AV5 (D)S-0.5-1	12/20/2018	**1,000 J**	**970 J**	**1,200 J**	**520 J**	**1,100 J**	**120 J**	**450 J**	**1,361**	**140**	**430 J**	**84 J**	**640 J**	**470 J**	**2,000 J**	**370 J**	**150 J**	**2,100 J**	**2,200 J**	**330 J**	**580 J**
DG-AV5	2	3.5-4	DG-AV5S-3.5-4	12/20/2018	**6.6**	**5.7**	**10**	**4.1 J**	**7**	<3.5	<4.2	**9**	<5.0	<2.8	**2.8 J**	**6.5**	**7.4**	**13**	<2.2	**8.5**	**4.3 J**	**11**	**5.8**	**22 J**
DG-AV5	2	7.5-8	DG-AV5S-7.5-8	12/20/2018	**2.0 J**	**4.6 J**	**43**	**4.0 J**	**25**	**3.9 J**	<4.1	**13**	<4.9	<2.8	<2.4	<2.0	**5.5**	**9.5**	<2.2	**5**	**31 J**	**8.1**	**3.9**	<10

Table 3: Polynuclear Aromatic Hydrocarbons and TPH as Diesel and Motor Oil Concentrations in Soil
Brisbane Baylands OU-2
Brisbane, California

Sample Location	Investigation Zone	Depth Range (ft bgs)	Sample Name	Collection Date	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Chrysene	Dibenzo(a,h)anthracene	Indeno(1,2,3-cd)pyrene	Benzo(a)pyrene Equivalent Total PAHs [4]	2-Methylnaphthalene	Acenaphthene	Acenaphthylene	Anthracene	Benzo(g,h,i)perylene	Fluoranthene	Fluorene	Naphthalene	Phenanthrene	Pyrene	TPH-Diesel (C10-C28)	TPH-Motor Oil (C24-C36)
Direct Exposure Human Health Risk Level Residential Soil Exposure ESL [1]					1.1E+03	1.1E+02	1.1E+03	1.1E+04	1.1E+05	1.1E+02	1.1E+03	--	2.4E+05	3.6E+06	--	1.8E+07	--	2.4E+06	2.4E+06	3.8E+03	--	1.8E+06	2.6E+02	1.2E+04
Leaching to Groundwater Levels Non-drinking Water ESL [2]					1.0E+04	5.7E+03	7.5E+04	3.9E+04	1.0E+04	3.9E+05	3.2E+04	--	8.8E+02	1.2E+04	6.4E+03	1.9E+03	2.7E+04	8.6E+04	6.0E+03	1.2E+03	1.1E+04	4.5E+04	7.3E+03	--
Regional Background [3]					--	--	--	--	--	--	--	9.0E+02	--	--	--	--	--	--	--	--	--	--	--	--
Units					µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	mg/kg	mg/kg
DG-AW3	2	0.5-1	DG-AW3S-0.5-1	1/31/2019	**180**	**340**	**440**	**180**	**220**	**76**	**200**	**500**	**65 J**	<27	**55**	**76**	**230**	**230**	<22	**75**	**110**	**260**	**42**	**52**
DG-AW3	2	3.5-4	DG-AW3S-3.5-4	1/31/2019	**140 J**	**290**	**380**	**130**	**200**	**44**	**150**	**403**	**45 J**	<14	**69**	**43**	**200**	**250**	<11	**72**	**90**	**380**	**54**	**80**
DG-AX5	2	0.5-1	DG-AX5S-0.5-1	12/20/2018	**2,300**	**4,400**	**5,200**	**1,800**	**2,500**	**350**	**2,100**	**5,731**	<49	**160**	**410**	**450**	**2,300**	**6,300**	**120**	**130**	**2,700 J**	**8,900**	**47**	**130**
DG-AX5	2	3.5-4	DG-AX5S-3.5-4	12/20/2018	**150**	**230**	**260**	**79**	**190**	**33**	**190**	**324**	**5.7 J**	**14**	**29**	**50**	**250**	**440**	**25**	**11**	**350**	**570**	**5.2**	<10
DG-AY3	2	0.5-1	DG-AY3S-0.5-1	1/31/2019	**3.8 J**	**11**	**15**	**6.9 J**	**6.0 J**	<6.8	**10**	**17**	<9.8	<5.5	**7.8 J**	**12**	**14**	**8.0 J**	<4.3	<6.8	**4.4 J**	**9.6 J**	**17**	**14**
DG-AY3	2	3.5-4	DG-AY3S-3.5-4	1/31/2019	<150	**440 J**	**470 J**	**280 J**	**170 J**	<350	<420	**693**	<500	<280	**240 J**	<200	**560**	**270 J**	<220	<350	**250 J**	**420 J**	**130**	**170**
DG-N9	3	0.5-1	DG-N9S-0.5-1	1/10/2019	**2,800**	**5,400**	**6,200**	**2,400**	**4,500**	**490**	**1,800**	**6,999**	**330**	**97**	**2,100**	**710**	**2,200**	**5,700**	**310**	**1,100**	**6,000**	**11,000**	**380**	**960**
DG-N9	3	3.5-4	DG-N9S-3.5-4	1/10/2019	**36**	**63**	**94**	**26**	**65**	**11**	**36**	**91**	**16**	<2.8	**32**	**10**	**47**	**72**	**4.4 J**	**36**	**86**	**110**	**15**	**37 J**
DG-N13	3	0.5-1	DG-N13S-0.5-1	1/10/2019	**62 J**	**140 J**	**180 J**	**61 J**	**87**	**11 J**	**64**	**182**	**10 J**	<5.5	**22**	**49**	**83**	**170 J**	<4.3	**22**	**59**	**230 J**	**59**	**170**
DG-N13 (D)	3	0.5-1	DG-N13 (D)S-0.5-1	1/10/2019	**37 J**	**80 J**	**100 J**	**35 J**	**63**	**9.5 J**	**50**	**109**	**23 J**	<5.5	**18**	**48**	**72**	**100 J**	<4.3	**27**	**50**	**120 J**	**57**	**160**
DG-N13	3	3.5-4	DG-N13S-3.5-4	1/10/2019	**8.7**	**8.1**	**14**	**2.1 J**	**30**	**3.6 J**	<4.2	**14**	**190**	**8.7**	**2.9 J**	**12**	**8.5**	**15**	**54**	**79**	**160**	**27**	**13**	**15 J**
DG-N13	3	7.5-8	DG-N13S-7.5-8	1/10/2019	<1.5	<1.9	<2.1	<2.1	<1.4	<3.4	<4.1	**3**	<4.9	<2.7	<2.4	<2.0	<4.2	<1.4	<2.2	<3.4	<1.8	<1.7	**1.3 J**	<9.8
DG-O7	3	0.5-1	DG-O7S-0.5-1	1/8/2019	<7.4	**49**	<10	<10	**24**	<17	<21	**59**	<25	<14	<12	<9.8	**62**	<6.9	<11	<17	**22**	**38**	**170**	**550**
DG-O7	3	3.5-4	DG-O7S-3.5-4	1/8/2019	**4**	**4.4**	**6.5**	**2.4**	**6.4**	<3.4	<4.1	**7**	<4.8	<2.7	<2.3	<1.9	**5.9**	**7**	<2.1	<3.4	**5.6**	**11**	**63**	**170**
DG-O11	3	0.5-1	DG-O11S-0.5-1	1/10/2019	**40**	**39**	**85**	**26**	**77**	**7**	**18**	**61**	**5.1 J**	<2.8	**7.1**	**7.2**	**22**	**37**	<2.2	**31**	**58**	**57**	**31**	**88**
DG-O11	3	3.5-4	DG-O11S-3.5-4	1/10/2019	**150**	**140**	**230**	**88**	**230**	**18 J**	**53**	**202**	**66**	<14	**34**	**38**	**69**	**180**	<11	**78**	**100**	**320**	**99**	**330**
DG-O15	3	0.5-1	DG-O15S-0.5-1	1/10/2019	**7.4**	**9.9**	**16**	**5.6**	**15**	<3.4	**7.1**	**15**	**9.3 J**	**2.8 J**	**5**	**3.1 J**	**9**	**16**	**3.0 J**	**11**	**21**	**22**	**65**	**120**
DG-O15	3	3.5-4	DG-O15S-3.5-4	1/10/2019	**3.0 J**	**5.1 J**	**8.3**	**3.1 J**	**5.5 J**	<3.4	<4.1	**8**	**9.1 J**	<2.7	<2.3	<1.9	<4.2	**6.8**	<2.1	**6.0 J**	**6.4**	**7.9**	**8.3**	**30 J**
DG-O15 (D)	3	3.5-4	DG-O15 (D)S-3.5-4	1/10/2019	**2.3 J**	**3.9 J**	**6.6**	**2.3 J**	**4.5 J**	<3.4	<4.1	**7**	**7.8 J**	<2.8	<2.4	<2.0	<4.2	**5.4**	<2.2	**4.5 J**	**5.7**	**6.1**	**7.3**	**30 J**
DG-O15	3	7.5-8	DG-O15S-7.5-8	1/10/2019	<1.5	<1.9	<2.1	<2.1	<1.4	<3.5	<4.1	**3**	<4.9	<2.8	<2.4	<2.0	<4.2	<1.4	<2.2	<3.5	<1.8	<1.7	**1.2 J**	<9.9
DG-P9	3	0.5-1	DG-P9S-0.5-1	11/21/2018	**8.7 J**	**16**	**18**	<4.2	**10**	<6.9	**16**	**24**	**10 J**	<5.6	**24**	**13**	**50**	**9.8 J**	<4.4	**10**	**17**	**17**	**96**	**380**
DG-P9	3	3.5-4	DG-P9S-3.5-4	11/21/2018	**11**	**17**	**67**	**10**	**67**	**11**	**14**	**37**	<4.7	<2.6	**3.5 J**	**3.7 J**	**16**	**54**	<2.1	<3.3	**240**	**42**	**14**	**45 J**
DG-P13	3	0.5-1	DG-P13S-0.5-1	1/10/2019	<1.5	**2.3 J**	**4.0 J**	<2.1	**2.7 J**	<3.5	<4.2	**5**	<4.9	<2.8	<2.4	<2.0	<4.3	**4.0 J**	<2.2	<3.5	**3.9 J**	**3.9 J**	**25**	**89**
DG-P13	3	3.5-4	DG-P13S-3.5-4	1/10/2019	**5.8**	**11**	**36**	**6**	**29**	<3.4	**6.1**	**18**	**7.8 J**	<2.7	**4.0 J**	**2.7 J**	**9.4**	**18**	<2.1	**45**	**50**	**21**	**90 J**	**330 J**
DG-P13 (D)	3	3.5-4	DG-P13 (D)S-3.5-4	1/10/2019	**5.3**	**11**	**36**	**6.8**	**26**	<3.4	**5.8**	**18**	**6.2 J**	<2.7	**3.8 J**	**2.6 J**	**8.3**	**18**	<2.2	**37**	**42**	**21**	**22 J**	**70 J**
DG-Q11	3	0.5-1	DG-Q11S-0.5-1	1/10/2019	**150 J**	**150 J**	**220 J**	**75 J**	**280 J**	<69	<83	**227**	**220 J**	<55	<47	**74 J**	**120**	**170 J**	<43	**150 J**	**380**	**300 J**	**950**	**2,800**
DG-Q11 (D)	3	0.5-1	DG-Q11 (D)S-0.5-1	1/10/2019	**58 J**	**91 J**	**150 J**	<80	**170 J**	<130	<160	**185**	<190 UJ	<110	<91	<76	<160	**110 J**	<84	**130 J**	**230**	**180 J**	**920**	**2,600**
DG-Q11	3	3.5-4	DG-Q11S-3.5-4	1/10/2019	<140	<180	<200	<200	<130	<340	<400	**298**	**520 J**	<270	<230	<190	<410	<130	<210	<340	**260 J**	<160	**2,300**	**5,700**
DG-Q15	3	0.5-1	DG-Q15S-0.5-1	1/11/2019	**230**	**180**	**360**	**42 J**	**480**	**83 J**	**96 J**	**333**	**1,500**	<55	<47	**44 J**	**180 J**	**83 J**	**55 J**	**590**	**620**	**160 J**	**460 J**	**1,100 J**
DG-Q15 (D)	3	0.5-1	DG-Q15 (D)S-0.5-1	1/11/2019	**180 J**	**260**	**390**	<100	**530**	<170	<210	**414**	**1,600**	<140	<120	<99	**220 J**	**100 J**	<110	**580**	**690**	**280 J**	**1,200 J**	**2,900 J**
DG-Q15	3	3.5-4	DG-Q15S-3.5-4	1/11/2019	**24**	**33**	**46 J**	**17 J**	**40**	**5.2 J**	**24 J**	**48**	**89 J**	**2.8 J**	**12**	**8.8**	**35 J**	**56**	**2.8 J**	**74 J**	**44**	**68 J**	**32**	**150**
DG-Q15	3	7.5-8	DG-Q15S-7.5-8	1/11/2019	<1.5	<1.9	<2.0	<2.0	**1.4 J**	<3.4	<4.1	**3**	<4.9	<2.7	<2.3	<1.9	<4.2	**2.3 J**	<2.1	<3.4	<1.8	<1.7	**2.8**	**20 J**
DG-R9	3	0.5-1	DG-R9S-0.5-1	1/22/2019	**98 J**	**220**	**300**	**120 U**	**100 J**	<86	**120**	**316**	<120	<69	**120**	**190**	**140**	**220**	<54	**130**	**140**	**260**	**320**	**390**
DG-R9	3	3.5-4	DG-R9S-3.5-4	1/22/2019	**11**	**15**	**28**	**7.3**	**16**	**4.5 J**	**8.6**	**24**	<4.7	<2.7	**4.7**	**4.9**	**10**	**14**	<2.1	**5.1**	**19**	**20**	**39**	**44 J**
DG-R13	3	0.5-1	DG-R13S-0.5-1	1/28/2019	**300**	**200**	**470**	**110**	**620**	**140**	**120**	**431**	**3,300**	<55	**49 J**	**150**	**160**	**240**	**130**	**1,500**	**1,400**	**330**	**350**	**870**
DG-R13	3	3.5-4	DG-R13S-3.5-4	1/28/2019	**6.8**	**7.9**	**16**	**4.9 U**	**13**	**4.0 J**	<4.1	**14**	**72**	<2.7	<2.3	**3.3 J**	**4.8 J**	**7.1**	**3.1 J**	**32**	**32**	**9.5**	**24**	**59**
DG-R15	3	3.5-4	DG-R15S-3.5-4	12/21/2018	**320 J**	**490 U**	**700**	<210	**1,100**	<340	<410	**785**	<490	<280	<240	**710**	<420	**190 J**	<220	**1,000**	**1,000**	**940**	**10,000**	**29,000**
DG-S9	3	4.5-5	DG-S9S-4.5-5	12/20/2018	**98 J**	**220**	**420**	<42	**330**	<70	**100**	**317**	**110 J**	<56	**58 J**	**210**	**140**	**310**	<44	**120**	**140**	**700**	**3,000**	**7,300**
DG-S9	3	7.5-8	DG-S9S-7.5-8	12/20/2018	**20 J**	**21 J**	**55**	<10	**45**	<17	<21	**38**	<25	**35**	<12	**99**	<21	**50**	**17 J**	**24 J**	**120**	**92**	**1,900**	**2,700**
DG-S11	3	0.5-1	DG-S11S-0.5-1	1/10/2019	<74	<94	<100	<100	<69	<170	<210	**152**	<250	<140	<120	<99	<210	<69	<110	<170	<89	<84	**680**	**1,900**
DG-S11	3	3.5-4	DG-S11S-3.5-4	1/10/2019	**97 J**	**97 J**	**240**	<83	**230**	<140	<170	**210**	**240 J**	<110	<95	<79	<170	**290**	<87	<140 UJ	**460**	**320**	**1,200**	**2,700**
DG-S15	3	0.5-1	DG-S15S-0.5-1	1/11/2019	<30	**42 J**	**58 J**	<41	<28	<69	<83	**88**	<98	<55	<47	<39	<85	**30 J**	<43	<69	**41 J**	**71 J**	**940**	**2,400**
DG-S15	3	3.5-4	DG-S15S-3.5-4	1/11/2019	**7.8**	**6.3**	**57**	**6.7 J**	**74 J**	**4.5 J**	**7**	**18**	**42 J**	<2.7 UJ	**3.0 J**	**5**	**9.7**	**41 J**	**11 J**	**100**	**280 J**	**28**	**13**	**33 J**
DG-S15 (D)	3	3.5-4	DG-S15 (D)S-3.5-4	1/11/2019	**10**	**8.4**	**36**	**3.7 J**	**37 J**	**3.5 J**	**5.1**	**17**	**140 J**	**3.8 J**	**2.4 J**	**6.3**	**9.7**	**24 J**	**37 J**	**89**	**140 J**	**27**	**16**	**41 J**

Table 3: Polynuclear Aromatic Hydrocarbons and TPH as Diesel and Motor Oil Concentrations in Soil
Brisbane Baylands OU-2
Brisbane, California

Sample Location	Investigation Zone	Depth Range (ft bgs)	Sample Name	Collection Date	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Chrysene	Dibenzo(a,h)anthracene	Indeno(1,2,3-cd)pyrene	Benzo(a)pyrene Equivalent Total PAHs [4]	2-Methylnaphthalene	Acenaphthene	Acenaphthylene	Anthracene	Benzo(g,h,i)perylene	Fluoranthene	Fluorene	Naphthalene	Phenanthrene	Pyrene	TPH-Diesel (C10-C28)	TPH-Motor Oil (C24-C36)
Direct Exposure Human Health Risk Level Residential Soil Exposure ESL [1]					1.1E+03	1.1E+02	1.1E+03	1.1E+04	1.1E+05	1.1E+02	1.1E+03	--	2.4E+05	3.6E+06	--	1.8E+07	--	2.4E+06	2.4E+06	3.8E+03	--	1.8E+06	2.6E+02	1.2E+04
Leaching to Groundwater Levels Non-drinking Water ESL [2]					1.0E+04	5.7E+03	7.5E+04	3.9E+04	1.0E+04	3.9E+05	3.2E+04	--	8.8E+02	1.2E+04	6.4E+03	1.9E+03	2.7E+04	8.6E+04	6.0E+03	1.2E+03	1.1E+04	4.5E+04	7.3E+03	--
Regional Background [3]					--	--	--	--	--	--	--	9.0E+02	--	--	--	--	--	--	--	--	--	--	--	--
Units					µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	mg/kg	mg/kg
DG-S15	3	6-6.5	DG-S15S-6-6.5	1/11/2019	<30	<38	<42	<42	**67 J**	<69	<83	**62**	<99	<55	<47	<40	<85	<28	<44	<69	**240**	**120**	**1,500**	**1,400**
DG-T9	3	0.5-1	DG-T9S-0.5-1	1/10/2019	**7.5**	**8.5**	**15**	**4.8 J**	**12**	<3.4	**4.3 J**	**13**	**7.5 J**	<2.7	**3.0 J**	**7.1**	**6.6**	**15**	<2.1	**6.8**	**12**	**16**	**46**	**86**
DG-T9	3	3.5-4	DG-T9S-3.5-4	1/10/2019	<1.5	<1.9	<2.1	<2.1	<1.4	<3.4	<4.1	**3**	<4.9	<2.7	<2.3	<2.0	<4.2	<1.4	<2.1	<3.4	<1.8	<1.7	**1.9 J**	<9.9
DG-T13	3	0.5-1	DG-T13S-0.5-1	1/10/2019	**8.5 J**	**14 J**	**29 J**	<10	**26 J**	<17	<21	**27**	**78 J**	<14	<12 UJ	**10 J**	<21 UJ	**20 J**	<11	**56 J**	**43 J**	**27 J**	**280 J**	**730 J**
DG-T13 (D)	3	0.5-1	DG-T13 (D)S-0.5-1	1/10/2019	**21 J**	**34 J**	**56 J**	<21	**57 J**	<35	<42	**61**	**220 J**	<28	**25 J**	**21 J**	**74 J**	**38 J**	<22	**120 J**	**94 J**	**55 J**	**530 J**	**1,500 J**
DG-T13	3	3.5-4	DG-T13S-3.5-4	1/10/2019	**10**	**11**	**15**	**5.3**	**14**	<3.5	**8.5**	**16**	**5.4 J**	<2.8	<2.4	**3.2 J**	**13**	**27**	<2.2	**5.2**	**25**	**23**	**11**	**27 J**
DG-T17	3	0.5-1	DG-T17S-0.5-1	1/28/2019	**350**	**250 U**	**410**	**250 U**	**340**	<170	<210	**424**	**2,100**	<140	**140 J**	**330**	<210	**740**	<110	**1,300**	**740**	**630**	**1,200**	**3,400**
DG-T17	3	3.5-4	DG-T17S-3.5-4	1/28/2019	**18 J**	**49 UJ**	**78**	**49 UJ**	**28 J**	<34 UJ	<41 UJ	**78**	<49	<27 UJ	<23	**34 J**	<42 UJ	**49 UJ**	<21 UJ	<34	**24 J**	**54**	**59**	**200**
DG-T17	3	7-7.5	DG-T17S-7-7.5	1/28/2019	**140**	**230**	**400**	**98**	**170 J**	**69**	**100**	**364**	**200**	<27	<23	**87**	**130**	**270**	**61**	**480**	**260**	**240**	**940 J**	**900 J**
DG-T17 (D)	3	7-7.5	DG-T17 (D)S-7-7.5	1/28/2019	**220**	**180**	**480**	**120**	**290 J**	**53**	**110**	**315**	**260**	<28	<24	**85**	**110**	**350**	**68**	**470**	**320**	**370**	**420 J**	**450 J**
DG-U11	3	0.5-1	DG-U11S-0.5-1	1/10/2019	**92 J**	**140 J**	**190 J**	<83	**300**	<140	<170	**247**	**1,000**	**130 J**	<94	**170 J**	<170	**230**	**150 J**	**380**	**650**	**660**	**3,600**	**4,900**
DG-U11	3	3.5-4	DG-U11S-3.5-4	1/10/2019	**12**	**17**	**34**	**8.7**	**30**	<3.5	**6.3**	**24**	**46**	**8**	**7.8**	**28**	**8.4**	**32**	**9**	**40**	**76**	**51**	**270**	**450**
DG-U13	3	7.5-8	DG-U13S-7.5-8	12/21/2018	**45 J**	**98 U**	**98 U**	<41	**200**	<69	<83	**151**	<98	<55	<47	**44 J**	<84	**29 J**	<43	<69	**37 J**	**280**	**1,100**	**2,700**
DG-U15	3	3.5-4	DG-U15S-3.5-4	1/28/2019	<2.9	**9.6 U**	**9.9**	**9.6 U**	**3.9 J**	<6.7	<8.0	**15**	**12 J**	<5.4	<4.6	**4.6 J**	**8.6 J**	**9.6 U**	<4.2	**9.0 J**	**5.6 J**	**9.6 U**	**20**	**66**
DG-U15	3	8.5-9	DG-U15S-8.5-9	1/28/2019	<73	**240 U**	**240 U**	<100	<68	<170	<200	**363**	<240	<140	<120	**120 J**	<210	<68	<110	<170	<87	**280**	**2,400**	**3,100**
DG-U17	3	0.5-1	DG-U17S-0.5-1	1/28/2019	<29	**98 U**	**110**	**98 U**	**62 J**	<69	<82	**150**	**320**	<55	<47	**67 J**	**87 J**	**100**	<43	**300**	**170**	**130**	**500**	**1,800**
DG-V13	3	0.5-1	DG-V13S-0.5-1	1/10/2019	<28	**63 J**	**100**	<40	**66 J**	<66	<79	**112**	<94	<53	<45	<38	<81	**64 J**	<42	**70 J**	**78 J**	**83 J**	**710**	**2,300**
DG-V13	3	3.5-4	DG-V13S-3.5-4	1/10/2019	**170**	**170**	**220**	**83 J**	**200**	<68	<82	**248**	<98	<55	<47	<39	**100**	**260**	<43	<68	**250**	**440**	**710**	**2,300**
DG-V13	3	7.5-8	DG-V13S-7.5-8	1/10/2019	**6.2**	**3.0 J**	**5.2**	**2.4 J**	**6.1**	<3.4	<4.0	**6**	<4.8	<2.7	<2.3	**3.5 J**	<4.1	**13**	<2.1	<3.4	**13**	**8.8**	**5.7**	**22 J**
DG-V17	3	0.5-1	DG-V17S-0.5-1	1/28/2019	**33**	**54**	**93**	**29**	**40**	**25 U**	**34**	**95**	<25	<14	<12	**14 J**	**41**	**41**	<11	<17	**25**	**69**	**70**	**210**
DG-V17	3	3.5-4	DG-V17S-3.5-4	1/28/2019	<1.5 UJ	**4.8 UJ**	**5.1 J**	**4.8 U**	**2.1 J**	<3.4	<4.1 UJ	**7**	<4.8	<2.7	<2.3	<1.9	**4.2 J**	**4.8 UJ**	<2.1	<3.4	**1.9 J**	**5.1 J**	**3.1**	**16 J**
DG-V17 (D)	3	3.5-4	DG-V17 (D)S-3.5-4	1/28/2019	**2.2 J**	**7.1 J**	**9.1 J**	**4.7 U**	**3.8 J**	<3.3	**5.7 J**	**11**	<4.7	<2.7	<2.3	<1.9	**6.3 J**	**8.4 J**	<2.1	<3.3	**4.1 J**	**11 J**	**3.4**	**19 J**
DG-V17	3	9.5-10	DG-V17S-9.5-10	1/28/2019	**180**	**240**	**290**	**81**	**190**	**26**	**90**	**323**	**340**	**65**	**34**	**130**	**140**	**540**	**68**	**290**	**380**	**770**	**170**	**210**
DG-W11	4	0.5-1	DG-W11S-0.5-1	1/29/2019	**250**	**460**	**550**	**210**	**290**	**89 J**	**230**	**654**	<98	<55	**140**	**120**	**290**	**380**	<43	**86 J**	**170**	**650**	**240**	**620**
DG-W11	4	3.5-4	DG-W11S-3.5-4	1/29/2019	<1.5	**5.1**	**5.6**	**4.9 U**	**2.3 J**	<3.4	**4.1 J**	**8**	<4.9	<2.7	<2.4	**2.4 J**	**4.6 J**	**4.3 J**	<2.2	<3.4	**3.2 J**	**7.2**	**1.4 J**	<9.5
DG-W11 (D)	4	3.5-4	DG-W11 (D)S-3.5-4	1/29/2019	<1.5	**5.4**	**5.5**	**4.9 U**	**2.0 J**	<3.4	**4.3 J**	**8**	<4.9	<2.8	<2.4	**2.3 J**	**4.8 J**	**4.0 J**	<2.2	<3.4	**3.3 J**	**6.5**	**3.4 J**	**13 J**
DG-W15	4	0.5-1	DG-W15S-0.5-1	1/28/2019	<300	**990 U**	**990 U**	**990 U**	<280	<690	<830	**1501**	<990	<560	<480	<400	<850	**990 U**	<440	<690	<360	**990 U**	**700**	**2,900**
DG-W15 (D)	4	0.5-1	DG-W15 (D)S-0.5-1	1/28/2019	<73	**240 U**	**140 J**	**240 U**	<68	<170	<200	**355**	<240	<140	<120	<98	<210	<68	<110	<170	<88	**100 J**	**510**	**2,600**
DG-W15	4	3.5-4	DG-W15S-3.5-4	1/28/2019	<150 U	**260 J**	**260 J**	**210 J**	<140 U	<350 U	<410	**491**	<490	<280	<240	<200 U	<420 U	<140	<220	<350 UJ	<180	**580**	**2,200**	**4,400**
DG-X13	4	0.5-1	DG-X13S-0.5-1	1/22/2019	**38**	**240**	**590**	**99**	**97**	<69	**92**	**348**	<98	<55	<93	**85**	**96**	**68**	<85	<69	**57**	**210**	**490**	**1,300**
DG-X13	4	3.5-4	DG-X13S-3.5-4	1/22/2019	<15	**30 J**	**43 J**	**49 UJ**	<14 UJ	<34 UJ	<41 UJ	**55**	<49	<27	**32 J**	<20 UJ	<42 UJ	**16 J**	<22	<34	<18	**28 J**	**180 J**	**280 J**
DG-X13 (D)	4	3.5-4	DG-X13 (D)S-3.5-4	1/22/2019	<15	**52 J**	**100 J**	**49 UJ**	**26 J**	<34 UJ	**59 J**	**86**	<49	<27	**53 J**	**28 J**	**110 J**	**31 J**	<21	<34	<17	**86 J**	**860 J**	**1,300 J**
DG-X17	4	0.5-1	DG-X17S-0.5-1	1/28/2019	<150	**500 U**	**500 U**	**500 U**	<140	<350	<420	**759**	<500	<280	<240	<200	<430	<140	<220	<350	<180	**500 U**	**420**	**1,600**
DG-X17	4	3.5-4	DG-X17S-3.5-4	1/28/2019	<290	**980 U**	**550 J**	**980 U**	<270	<690	<820	**1445**	<980	<550	<470	<390	<840	**270 J**	<430	<690	<350	**560 J**	**1,500**	**4,600**
DG-Y11	4	0.5-1	DG-Y11S-0.5-1	1/21/2019	**220 J**	**680**	**690**	**340 J**	**280 J**	**400 J**	**520**	**1227**	<480	<270	<230	**260 J**	**900**	**320 J**	<210	<340	**180 J**	**920**	**2,200**	**6,100**
DG-Y11	4	3.5-4	DG-Y11S-3.5-4	1/21/2019	<2.8	**8.5 J**	**16**	**6.0 J**	**6.9 J**	**6.8 J**	**10**	**18**	<9.4	<5.3	**6.5 J**	**34**	**19**	**5.5 J**	<4.1	<6.6	**12**	**9.8**	**250**	**260**
DG-Y15	4	0.5-1	DG-Y15S-0.5-1	1/31/2019	<59	**100 J**	**140 J**	<83	<55	<140	<170	**196**	<200	<110	<95	**85 J**	<170	**87 J**	<87	<140	**77 J**	**110 J**	**620**	**860**
DG-Y15	4	3.5-4	DG-Y15S-3.5-4	1/31/2019	<7.3	**16 J**	**20 J**	**14 J**	<6.8 UJ	<17	<21	**28**	<24	<14	<12	**13 J**	<21	**12 J**	<11	<17	**13 J**	**18 J**	**180**	**270**
DG-Y15 (D)	4	3.5-4	DG-Y15 (D)S-3.5-4	1/31/2019	<7.5	**20 J**	**29 J**	**16 J**	**9.3 J**	<17	<21	**33**	<25	<14	<12	**13 J**	<21	**18 J**	<11	<17	**16 J**	**26 J**	**120**	**170**
DG-Y15	4	7.5-8	DG-Y15S-7.5-8	1/31/2019	<59	**170 J+**	**250 J+**	<83	**280 J+**	<140	<170	**277**	**2,600 J+**	**1,000 J+**	**400 J+**	**260 J+**	<170	**290 J+**	**820 J+**	**1,300 J+**	**990 J+**	**830 J+**	**3,600**	**1,600**
DG-Y19	4	0.5-1	DG-Y19S-0.5-1	1/28/2019	<150	**500 U**	**500 U**	<210	<140	<350	<420	**755**	<500	<280	<240	<200	<430	<140	<220	<350	<180	**500 U**	**1,000**	**6,400**
DG-Y19	4	3.5-4	DG-Y19S-3.5-4	1/28/2019	**50**	**69**	**140**	**52**	**56**	<33	**49**	**110**	**53 J**	<27	**25 J**	**42 J**	**51**	**74**	<21	**36 J**	**68**	**97**	**82**	**320**
DG-Y19	4	7.5-8	DG-Y19S-7.5-8	1/28/2019	<1.4	**4.8 U**	**4.8 U**	**4.8 U**	<1.3	<3.4	<4.0	**7**	<4.8	<2.7	<2.3	<1.9	<4.1	**4.8 U**	<2.1	<3.4	<1.7	**5**	**5.5**	<9.8
DG-Z13	4	0.5-1	DG-Z13S-0.5-1	1/28/2019	<15	**49 U**	**32 J**	**49 U**	<14	<35	<42	**73**	**110**	<28	<24	**29 J**	<43	**21 J**	<22	**37 J**	**86**	**40 J**	**1,000**	**200 J**

Table 3: Polynuclear Aromatic Hydrocarbons and TPH as Diesel and Motor Oil Concentrations in Soil
Brisbane Baylands OU-2
Brisbane, California

Sample Location	Investigation Zone	Depth Range (ft bgs)	Sample Name	Collection Date	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Chrysene	Dibenzo(a,h)anthracene	Indeno(1,2,3-cd)pyrene	Benzo(a)pyrene Equivalent Total PAHs [4]	2-Methylnaphthalene	Acenaphthene	Acenaphthylene	Anthracene	Benzo(g,h,i)perylene	Fluoranthene	Fluorene	Naphthalene	Phenanthrene	Pyrene	TPH-Diesel (C10-C28)	TPH-Motor Oil (C24-C36)
Direct Exposure Human Health Risk Level Residential Soil Exposure ESL [1]					1.1E+03	1.1E+02	1.1E+03	1.1E+04	1.1E+05	1.1E+02	1.1E+03	--	2.4E+05	3.6E+06	--	1.8E+07	--	2.4E+06	2.4E+06	3.8E+03	--	1.8E+06	2.6E+02	1.2E+04
Leaching to Groundwater Levels Non-drinking Water ESL [2]					1.0E+04	5.7E+03	7.5E+04	3.9E+04	1.0E+04	3.9E+05	3.2E+04	--	8.8E+02	1.2E+04	6.4E+03	1.9E+03	2.7E+04	8.6E+04	6.0E+03	1.2E+03	1.1E+04	4.5E+04	7.3E+03	--
Regional Background [3]					--	--	--	--	--	--	--	9.0E+02	--	--	--	--	--	--	--	--	--	--	--	--
Units					µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	mg/kg	mg/kg
DG-Z13	4	3.5-4	DG-Z13S-3.5-4	1/28/2019	<7.3	**24 U**	**40**	**24 U**	**21 J**	<17	<21	**38**	**150**	<14	**12 J**	**25**	**21 J**	**20 J**	**37**	**35**	**54**	**36**	**290**	**280**
DG-Z17	4	0.5-1	DG-Z17S-0.5-1	1/28/2019	<74	**350 J**	**250 U**	**250 U**	<69	<170	<210	**477**	<250	<140	<120	<99	<210	**250 U**	<110	<170	<89	**250 U**	**400**	**1,200**
DG-Z17 (D)	4	0.5-1	DG-Z17 (D)S-0.5-1	1/28/2019	<30	**99 J**	**110**	**98 U**	**40 J**	<69	<83	**151**	<98	<55	<47	**52 J**	**110**	**98 U**	<43	<69	**43 J**	**110**	**590**	**1,300**
DG-Z17	4	3.5-4	DG-Z17S-3.5-4	1/28/2019	<150	**500 U**	**500 U**	**500 U**	<140	<350	<420	**759**	<500	<280	<240	<200	<430	<140	<220	<350	<180	<170	**1,300**	**4,800**
DG-Z17	4	7.5-8	DG-Z17S-7.5-8	1/28/2019	<71	**240 U**	**240 U**	**240 U**	<67	<170	<200	**365**	**390 J**	**350**	**130 J**	**190 J**	<200	**240 U**	<100	<170	**550**	**290**	**1,800**	**990**
DG-AA11	4	0.5-1	DG-AA11S-0.5-1	1/29/2019	**42**	**74**	**63**	**25**	**35**	<17	**42**	**97**	<24	<14	<12	**33**	**64**	**140**	<11	<17	<8.8	**190**	**310**	**290**
DG-AA11	4	3.5-4	DG-AA11S-3.5-4	1/29/2019	<37	**54 J**	**53 J**	**120 U**	<34	<85	<100	**110**	<120	**220**	**73 J**	**110 J**	<100	**51 J**	**230**	**90 J**	**290**	**110 J**	**1,400**	**270**
DG-AA15	4	0.5-1	DG-AA15S-0.5-1	1/22/2019	<59	**130 J**	**160 J**	**200 UJ**	<55 UJ	<140 UJ	<170 UJ	**229**	<200	<110	<95	<79	<170 UJ	**78 J**	<87	<140	<71	**130 J**	**1,400**	**3,100**
DG-AA19	4	0.5-1	DG-AA19S-0.5-1	1/24/2019	<40	<40	<40	<40	**180 J**	<40	<40	**46**	<40	<40	<40	<40	**59 J**	**50 J**	<40	<40	**50 J**	**65 J**	**350**	**520**
DG-AA19	4	3.5-4	DG-AA19S-3.5-4	1/24/2019	**100 J**	**230**	**270**	**77 J**	**170 J**	<31	**330**	**316**	<31	<31	<31	<31	**430**	**270**	<31	<31	**140 J**	**320**	**55**	**110**
DG-AA19	4	8.5-9	DG-AA19S-8.5-9	1/24/2019	<8.0	<8.0	<8.0	<8.0	<8.0	<8.0	<8.0	**9**	<8.0	<8.0	<8.0	<8.0	<8.0	<8.0	<8.0	<8.0	**10 J**	<8.0	**5.9**	**3.5 J**
DG-AB13	4	0.5-1	DG-AB13S-0.5-1	1/22/2019	<35	**120 U**	**140**	**120 U**	**71 J**	<83	<99	**183**	<120	<66	<57	**48 J**	**110 J**	**57 J**	<52	<83	**81 J**	**110 J**	**610**	**1,300**
DG-AB13	4	3.5-4	DG-AB13S-3.5-4	1/22/2019	**1.8 J**	**4.4 J**	**5.3**	**4.8 U**	**3.3 J**	<3.4	<4.0	**7**	<4.8	<2.7	<2.3	**3.0 J**	**5.8 J**	**4.6 J**	<2.1	<3.4	**4.7 J**	**7.5**	**54**	**120**
DG-AB13 (D)	4	3.5-4	DG-AB13 (D)S-3.5-4	1/22/2019	**3.5 J**	**6.2 J**	**6.9**	**4.8 U**	**4.4 J**	<3.3	<4.0	**9**	<4.8	<2.7	<2.3	**2.6 J**	**4.3 J**	**5.6 J**	<2.1	<3.3	**4.5 J**	**8.8**	**35**	**95**
DG-AB13	4	13.5-14	DG-AB13S-13.5-14	1/22/2019	**19,000**	**14,000**	**8,400 J**	**10,000 U**	**31,000**	<7,000	<8,400	**20,791**	**76,000**	**25,000**	**6,200 J**	**32,000**	<8,600	**10,000**	**33,000**	**13,000**	**100,000**	**63,000**	**94,000**	**86,000**
DG-AC11	4	0.5-1	DG-AC11S-0.5-1	1/29/2019	<59 U	**110 J**	**100 J**	**200 UJ**	<55 U	<140 UJ	<160 UJ	**203**	<200 U	**130 J**	<94	**140 J**	<170 UJ	**57 J**	<86	<140 U	**190 J**	**190 J**	**5,000**	**910 J**
DG-AC11	4	3.5-4	DG-AC11S-3.5-4	1/29/2019	**350 J**	**1,200**	**840 J**	**990 U**	**650 J**	<690	<830	**1716**	<990	**730 J**	<480	**610 J**	**900 J**	**380 J**	**610 J**	<690	**420 J**	**3,200**	**5,400**	**9,500**
DG-AC11	4	8.5-9	DG-AC11S-8.5-9	1/29/2019	<30	**95 J**	**100**	**98 U**	**57 J**	<69	<83	**146**	<98	<55	<47	**43 J**	**89 J**	**87 J**	<43	<69	**85 J**	**190**	**770**	**1,100**
DG-AD13	4	0.5-1	DG-AD13S-0.5-1	2/1/2019	**63 J**	**110**	**120**	**96 U**	**160**	<67	<81	**167**	<96	<54	<46	**55 J**	**110**	**77 J**	<42	<67	**140**	**190**	**390**	**540**
DG-AD13	4	3.5-4	DG-AD13S-3.5-4	2/1/2019	<150	**490**	**490 U**	<210	**490**	<340	<410	**739**	<490	<270	<230	**200 J**	**500**	**190 J**	<210	<340	**280 J**	**670**	**2,400**	**5,900**
DG-AD13	4	7.5-8	DG-AD13S-7.5-8	2/1/2019	**1,100 J**	**1,000 J**	**980 UJ**	**980 U**	**1,700 J**	<680	<820	**1601**	**2,400 J**	**860 J**	<470 UJ	**1,500 J**	<840 UJ	**810 J**	**1,700 J**	**1,100 J**	**3,800 J**	**4,200 J**	**8,400 J**	**10,000 J**
DG-AD13 (D)	4	7.5-8	DG-AD13 (D)S-7.5-8	2/1/2019	**2,400 J**	**2,200 J**	**1,500 J**	**1,200 U**	**4,400 J**	<860	<1,000	**3086**	**16,000 J**	**4,000 J**	**860 J**	**3,500 J**	**1,200 J**	**2,000 J**	**5,700 J**	**6,900 J**	**13,000 J**	**9,800 J**	**15,000 J**	**19,000 J**
DG-AE11	4	0.5-1	DG-AE11S-0.5-1	1/21/2019	**41**	**44**	**53**	**25**	**42**	<17	<20	**63**	<24	**28**	<11	**18 J**	**24**	**65**	**21 J**	<17	**73**	**71**	**170**	**130**
DG-AE11	4	3.5-4	DG-AE11S-3.5-4	1/21/2019	**46 J**	**75 J**	**61 J**	<39	**85 J**	<66	<79	**123**	<94	<53	<45	<38	<81	**52 J**	<41	<66	**56 J**	**320**	**390**	**900**
DG-AF13	4	0.5-1	DG-AF13S-0.5-1	11/21/2018	**1,300**	**740**	**580**	<41	**2,900**	**110**	**84 J**	**1,050**	**1,700**	**2,700**	**580**	**2,900**	**170**	**1,300**	**4,300**	**660**	**13,000**	**4,700**	**15,000**	**17,000**
DG-AF13	4	0.5-1	DG-AF13S-0.5-1	1/28/2019	<300	**980 U**	**670 J**	**980 U**	<280	<690	<830	**1,458**	<980	<550	<470	<390	<850	<280	<430	<690	<350	**1,000**	**1,500**	**3,700**
DG-AF13	4	3.5-4	DG-AF13S-3.5-4	11/21/2018	**1,200**	**740**	**600**	<100	**2,600**	<170	<200	**1,018**	**1,000**	**2,900**	**590**	**2,600**	**220 J**	**1,100**	**4,000**	**930**	**9,800**	**4,100**	**52,000**	**63,000**
DG-AF13	4	3.5-4	DG-AF13S-3.5-4	1/28/2019	**24**	**39**	**52**	**21**	**24**	**8.2 J**	**13**	**56**	<9.8	<5.5	<4.7	**6.2 J**	**15**	**31**	<4.3	<6.9	**16**	**52**	**22**	**52**
DG-AF13	4	7-7.5	DG-AF13S-7-7.5	11/21/2018	**36**	**36**	**51**	**19**	**64**	**5.5**	**17**	**52**	**96**	**130**	**17**	**66**	**22**	**180**	**88**	**500**	**250**	**160**	**190**	**140**
DG-AG11	4	0.5-1	DG-AG11S-0.5-1	1/21/2019	**75 J**	**180**	**200**	**74 J**	**87 J**	<68	<81	**246**	<97	<54	<46	<39	**150**	**83 J**	<43	<68	**39 J**	**160**	**420**	**1,000**
DG-AG11	4	3.5-4	DG-AG11S-3.5-4	1/21/2019	<15	**31 J**	**39 J**	<20	**32 J**	<34	<41	**55**	<49	<27	<23	<20	<42	**31 J**	<21	<34	**23 J**	**50**	**180**	**410**
DG-AG11	4	9.5-10	DG-AG11S-9.5-10	1/21/2019	**790**	**510**	**260 J**	<200	**1,400**	<340	<400	**807**	**1,500**	**1,900**	**370 J**	**1,700**	<410	**500**	**3,500**	**1,500**	**7,500**	**4,100**	**9,500**	**8,700**
DG-AH13	4	0.5-1	DG-AH13S-0.5-1	1/29/2019	<74	<94	<100	<100	<69	<170	<210	**152**	<250	<140	<120	<98	<210	<69	<110	<170	<89	<84	**670**	**2,200**
DG-AH13	4	3.5-4	DG-AH13S-3.5-4	1/29/2019	<150	<190	<210	<210	<140	<340	<410	**305**	<490	<280	<240	<200	<420	<140	<220	<340	<180	<170	**2,200**	**4,300**
DG-AH13	4	7.5-8	DG-AH13S-7.5-8	1/29/2019	<600	**2,000 U**	**1,600 J**	<830	**3,800**	<1,400	<1,700	**2,983**	<2,000	<1,100	**1,000 J**	**4,700**	<1,700	**2,100**	**5,300**	<1,400	**2,300**	**7,100**	**20,000**	**18,000**
DG-AI11	4	0.5-1	DG-AI11S-0.5-1	1/21/2019	<3.0	<3.8	<4.2	<4.2	<2.8	<6.9	<8.3	**6**	<9.9	<5.5	<4.8	<4.0	<8.5	<2.8	<4.4	<6.9	<3.6	<3.4	**24**	**78**
DG-AI11 (D)	4	0.5-1	DG-AI11 (D)S-0.5-1	1/21/2019	<2.8	**7.1 J**	**6.2 J**	**4.9 J**	**3.0 J**	<6.6	<7.9	**12**	<9.4	<5.3	<4.5	**4.1 J**	**11 J**	**3.3 J**	<4.2	<6.6	**3.7 J**	**7.9 J**	**47 J**	**160 J**
DG-AI11	4	3.5-4	DG-AI11S-3.5-4	1/21/2019	**330**	**440**	**200 J**	<100	**740 J**	<170 UJ	<210	**590**	<250	**520**	<120	**650**	**240 J**	**490 J**	**470**	**180 J**	**1,100 J**	**2,200 J**	**10,000**	**14,000**
DG-AI11	4	9.5-10	DG-AI11S-9.5-10	1/21/2019	**1,900**	**850**	**280 J**	<210	**3,400**	<340	<410	**1,263**	**16,000**	**2,600**	**410 J**	**2,800**	**440 J**	**800**	**3,200**	**1,200**	**11,000**	**6,800**	**5,200**	**5,100**
DG-AJ13	4	0.5-1	DG-AJ13S-0.5-1	1/29/2019	<74	**250 U**	**200 J**	**250 U**	<69	<170	<210	**372**	<250	<140	<120	<99	**250**	<69	<110	<170	<89	**130 J**	**3,300**	**8,200**
DG-AJ13	4	3.5-4	DG-AJ13S-3.5-4	1/29/2019	<7.3	**24 U**	**15 J**	**24 U**	**7.0 J**	<17	<21	**36**	<24	<14	<12	<9.8	<21	**9.5 J**	<11	<17	<8.8	**20 J**	**130**	**280**
DG-AK11	4	0.5-1	DG-AK11S-0.5-1	1/22/2019	**66 J**	**200 U**	**110 J**	**200 U**	**180 J**	<140	<170	**298**	**550**	<110	<94	**210**	<170	**82 J**	**160 J**	<140	**590**	**390**	**460**	**510**
DG-AK11	4	3.5-4	DG-AK11S-3.5-4	1/22/2019	**3,300 J**	**4,700 U**	**3,800 J**	<2,000	**6,300**	<3,300	<4,000	**7,276**	<4,700	<2,700	<2,300	**5,600**	<4,100	**2,700 J**	**3,000 J**	<3,300	**6,500**	**16,000**	**34,000**	**38,000**
DG-AL13	4	0.5-1	DG-AL13S-0.5-1	1/29/2019	**20**	**26**	**43**	**18**	**17**	**7.5 J**	**13**	**41**	<9.8	<5.5	**7.0 J**	**8.6 J**	**18**	**30**	<4.3	<6.9	**9.1 J**	**39**	**60**	**170**

Table 3: Polynuclear Aromatic Hydrocarbons and TPH as Diesel and Motor Oil Concentrations in Soil
Brisbane Baylands OU-2
Brisbane, California

Sample Location	Investigation Zone	Depth Range (ft bgs)	Sample Name	Collection Date	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Chrysene	Dibenzo(a,h)anthracene	Indeno(1,2,3-cd)pyrene	Benzo(a)pyrene Equivalent Total PAHs [4]	2-Methylnaphthalene	Acenaphthene	Acenaphthylene	Anthracene	Benzo(g,h,i)perylene	Fluoranthene	Fluorene	Naphthalene	Phenanthrene	Pyrene	TPH-Diesel (C10-C28)	TPH-Motor Oil (C24-C36)
Direct Exposure Human Health Risk Level Residential Soil Exposure ESL [1]					1.1E+03	1.1E+02	1.1E+03	1.1E+04	1.1E+05	1.1E+02	1.1E+03	--	2.4E+05	3.6E+06	--	1.8E+07	--	2.4E+06	2.4E+06	3.8E+03	--	1.8E+06	2.6E+02	1.2E+04
Leaching to Groundwater Levels Non-drinking Water ESL [2]					1.0E+04	5.7E+03	7.5E+04	3.9E+04	1.0E+04	3.9E+05	3.2E+04	--	8.8E+02	1.2E+04	6.4E+03	1.9E+03	2.7E+04	8.6E+04	6.0E+03	1.2E+03	1.1E+04	4.5E+04	7.3E+03	--
Regional Background [3]					--	--	--	--	--	--	--	9.0E+02	--	--	--	--	--	--	--	--	--	--	--	--
Units					µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	mg/kg	mg/kg
DG-AL13	4	3.5-4	DG-AL13S-3.5-4	1/29/2019	<1.5	**5.0 U**	**4.7 J**	**5.0 U**	**2.5 J**	<3.5	<4.2	**8**	<5.0	<2.8	<2.4	**2.2 J**	**5.1**	**3.8 J**	<2.2	<3.5	<1.8	**6.3**	**6.3**	**17 J**
DG-AM11	4	0.5-1	DG-AM11S-0.5-1	1/22/2019	<1.5	**3.1 J**	**2.6 J**	**4.9 U**	<1.4	<3.4	<4.1	**5**	<4.9	<2.8	<2.4	<2.0	**4.2 J**	**1.5 J**	<2.2	<3.4	**2.4 J**	**3.9 J**	**22**	**79**
DG-AM11	4	3.5-4	DG-AM11S-3.5-4	1/22/2019	<150	<190	<210	<210	<140	<350	<420	**310**	<500	<280	<240	<200	<430	<140	<220	<350	<180	**200 J**	**1,600**	**3,300**
DG-AN13	4	0.5-1	DG-AN13S-0.5-1	1/31/2019	<730	<930	<1,000	<1,000	<690	<1,700	<2,100	**1,512**	<2,400	<1,400	<1,200	<980	<2,100	**700 J**	<1,100	<1,700	<880	**1,300 J**	**3,400 J-**	**6,700 J-**
DG-AN13	4	3.5-4	DG-AN13S-3.5-4	1/31/2019	<1.5	**6.4**	**9.5**	<2.1	**3.6 J**	<3.4	**4.7 J**	**10**	<4.9	<2.8	<2.4	**2.0 J**	**5.9**	**9.5**	<2.2	<3.4	**4.7 J**	**13**	**26**	**33**
DG-AN13	4	9.5-10	DG-AN13S-9.5-10	1/31/2019	<15	**38 J+**	**67 J+**	**34 J+**	**36 J**	<34 UJ	<41 UJ	**65**	**280**	**88**	**120**	**53**	<42 UJ	**120**	**34 J**	**4,900**	**330**	**160**	**54**	**31**
DG-AO11	5	0.5-1	DG-AO11S-0.5-1	1/22/2019	<73	**230 J**	**250**	**240 U**	**69 J**	<170	<200	**356**	<240	<140	<120	<97	<210	**120 J**	<110	<170	<87	**240**	**370**	**970**
DG-AO11	5	3.5-4	DG-AO11S-3.5-4	1/22/2019	**240 J**	**500 UJ**	**390 J**	<210 UJ	**660**	<350 UJ	<420 UJ	**761**	<500	<280	<240	**720**	<430 UJ	**340 J**	<220	<350	<180	**1,700**	**14,000**	**15,000**
DG-AQ11	5	0.5-1	DG-AQ11S-0.5-1	1/30/2019	**13 J**	**16 J**	**28 J**	**9.0 J**	**21 J**	<3.9	**12 J**	**23**	<3.9	<3.9	**4.3 J**	**9.2 J**	**17 J**	**24 J**	<3.9	**6.1 J**	**17 J**	**25 J**	**48**	**91**
DG-AQ11	5	3.5-4	DG-AQ11S-3.5-4	1/30/2019	<4.0	<4.0	<4.0	<4.0	**4.6 J**	<4.0	<4.0	**5**	<4.0	<4.0	<4.0	<4.0	**4.7 J**	<4.0	<4.0	**6.1 J**	**5.9 J**	<4.0	**6.5**	**7.6**
DG-AT9	5	0.5-1	DG-AT9S-0.5-1	1/30/2019	**36**	**47**	**79**	**24 J**	**48**	**8.7 J**	**36**	**71**	**16 J**	<3.9	**12 J**	**25 J**	**42**	**55**	<3.9	**13 J**	**36**	**59**	**17**	**25**
DG-AT9	5	3.5-4	DG-AT9S-3.5-4	1/30/2019	<4.0	<4.0	**6.8 J**	<4.0	**7.0 J**	<4.0	<4.0	**5**	<4.0	<4.0	<4.0	<4.0	<4.0	**4.3 J**	<4.0	**6.6 J**	**6.3 J**	<4.0	**8.4**	**7.5**
DG-AV9	5	0.5-1	DG-AV9S-0.5-1	2/1/2019	**170**	**230**	**330**	**110**	**220**	**54 J**	**120 J**	**347**	**60 J**	**40 J**	**30 J**	**74**	**140 J**	**240**	**54**	**110**	**230 J**	**370**	**660**	**840**
DG-AV9	5	3.5-4	DG-AV9S-3.5-4	2/1/2019	**27**	**34**	**62**	**24**	**40**	**14 J**	**25**	**60**	**22 J**	<11	**14 J**	**15 J**	**29**	**62**	<8.3	**57**	**60**	**54**	**76**	**170**
DG-AV9	5	8.5-9	DG-AV9S-8.5-9	2/1/2019	**12**	**9.8 U**	**20**	**9.8 U**	**23**	<6.9	<8.2	**17**	**37**	**6.6 J**	**6.3 J**	**10**	<8.4	**39**	**13**	**61**	**69**	**45**	**160**	**220**
DG-AX9	5	0.5-1	DG-AX9S-0.5-1	1/23/2019	**120**	**200**	**220**	**63**	**150**	**19 J**	**130**	**267**	**32 J**	**17 J**	**30 J**	**30 J**	**160**	**290**	**26 J**	**22 J**	**180**	**360**	**34**	**66**
DG-AX9	5	3.5-4	DG-AX9S-3.5-4	1/23/2019	**500**	**830**	**790**	**290**	**690**	**73 J**	**720**	**1,108**	**45 J**	**150 J**	**130 J**	**150 J**	**810**	**1,500**	**82 J**	**96 J**	**1,000**	**1,800**	**590**	**930**
DG-AX9	5	9.5-10	DG-AX9S-9.5-10	1/23/2019	**5.9 J**	**8.7 J**	**12 J**	<3.9	**11 J**	<3.9	**9.6 J**	**13**	<3.9	<3.9	<3.9	<3.9	**10 J**	**19 J**	<3.9	**5.7 J**	**12 J**	**21 J**	**5.7**	**6.7**
DG-AB17	6	0.5-1	DG-AB17S-0.5-1	1/24/2019	**47 J**	<40	**46 J**	<40	**44 J**	<40	<40	**52**	<40	<40	<40	<40	**80 J**	**78 J**	<40	**120 J**	<40	**92 J**	**610**	**370**
DG-AB17	6	3.5-4	DG-AB17S-3.5-4	1/24/2019	**570 J**	**1,100 J**	**1,200**	**300 J**	**590 J**	<160	**1,100 J**	**1,471**	<160	<160	**250 J**	<160	**1,000 J**	**1,300**	<160	<160	**200 J**	**1,800**	**3,100**	**1,000**
DG-AC15	6	0.5-1	DG-AC15S-0.5-1	1/31/2019	<150	<190	<210	<210	<140	<340	<410	**305**	<490	<270	<240	<200	<420	**170 J**	<220	<340	**330 J**	**260 J**	**330 J**	**490 J**
DG-AC15 (D)	6	0.5-1	DG-AC15 (D)S-0.5-1	1/31/2019	<2.9	**6.2 J**	**9.6 J**	**4.9 J**	**5.0 J**	<6.9	<8.2	**11**	**10 J**	**48**	<4.7	**16**	<8.4	**16 J**	**50**	**9.8**	**79 J**	**15 J**	**910 J**	**1,100 J**
DG-AC15	6	3.5-4	DG-AC15S-3.5-4	1/31/2019	**2,000**	**2,100**	**3,200**	**1,200**	**2,400**	**250**	**650**	**2,949**	<98	**62 J**	**130**	**2,400**	**610**	**6,600**	**96 J**	**73 J**	**240**	**6,100**	**44 B**	**38**
DG-AC15	6	7.5-8	DG-AC15S-7.5-8	1/31/2019	**700**	**710**	**830**	**360 J**	**870**	<350	<420	**1,063**	**12,000**	**1,100**	**410 J**	**690**	<430	**1,400**	**2,200**	**6,500**	**4,200**	**2,800**	**3,800**	**2,300**
DG-AD17	6	0.5-1	DG-AD17S-0.5-1	1/24/2019	<16	<16	<16	<16	**32 J**	<16	<16	**19**	**18 J**	<16	<16	<16	<16	**22 J**	<16	<16	**27 J**	**34 J**	**170**	**300**
DG-AD17	6	3.5-4	DG-AD17S-3.5-4	1/24/2019	**86 J**	**140 J**	**190 J**	**51 J**	**99 J**	**33 J**	**140 J**	**215**	<7.8	**69**	<7.8	**27 J**	**95**	**170 J**	**16 J**	<7.8	**15 J**	**130 J**	**22 J**	**7.4 J**
DG-AD17	6	7-7.5	DG-AD17S-7-7.5	1/24/2019	**12 J**	**8.7 J**	**14 J**	**5.5 J**	**11 J**	<4.0	<4.0	**14**	<4.0	**13 J**	<4.0	**6.6 J**	**5.6 J**	**88**	**6.9 J**	<4.0	**14 J**	**51**	**13**	**13**
DG-AG15	6	0.5-1	DG-AG15S-0.5-1	1/24/2019	<16	<16	<16	<16	<16	<16	<16	**18**	<16	<16	<16	<16	**20 J**	<16	<16	<16	<16	<16	**5.7**	**11**
DG-AG15	6	3.5-4	DG-AG15S-3.5-4	1/24/2019	**47 J**	**43 J**	**59 J**	<39	**59 J**	<39	<39	**75**	<39	<39	<39	<39	**40 J**	**67 J**	<39	<39	**40 J**	**80 J**	**99**	**39**
DG-AG15	6	8.5-9	DG-AG15S-8.5-9	1/24/2019	**76 J**	**140**	**170**	**39 J**	**98 J**	**16 J**	**150**	**196**	<16	<16	<16	**20 J**	**140**	**160**	<16	<16	**47 J**	**150**	**27 J**	**5.5**
DG-AH17	6	0.5-1	DG-AH17S-0.5-1	1/24/2019	**5.3 J**	**6.9 J**	**12 J**	**4.7 J**	<4.0	<4.0	<4.0	**11**	<4.0	<4.0	<4.0	<4.0	<4.0	**9.0 J**	<4.0	<4.0	**5.6 J**	**11 J**	**3.6 J**	**5.2**
DG-AI15	6	0.5-1	DG-AI15S-0.5-1	1/24/2019	<79	<79	<79	<79	**170 J**	<79	<79	**91**	<79	<79	<79	<79	<79	<79	<79	<79	<79	**110 J**	**370**	**150**
DG-AI15	6	3.5-4	DG-AI15S-3.5-4	1/24/2019	<3.9	<3.9	<3.9 UJ	<3.9	<3.9 UJ	<3.9	<3.9	**5**	<3.9	<3.9	<3.9	<3.9	<3.9	<3.9 UJ	<3.9	<3.9	<3.9	<3.9 UJ	**11**	**12**
DG-AI15 (D)	6	3.5-4	DG-AI15 (D)S-3.5-4	1/24/2019	<3.9	<3.9	**5.3 J**	<3.9	**4.9 J**	<3.9	<3.9	**5**	<3.9	<3.9	<3.9	<3.9	<3.9	**4.9 J**	<3.9	<3.9	<3.9	**8.2 J**	**15**	**17**
DG-AJ17	6	0.5-1	DG-AJ17S-0.5-1	1/24/2019	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	**5**	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	**5.4**	**11**
DG-AJ17	6	3.5-4	DG-AJ17S-3.5-4	1/24/2019	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	**5**	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<2.5	**3.1 J**
DG-AJ17	6	9.5-10	DG-AJ17S-9.5-10	1/24/2019	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	**5**	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<2.5	<2.5
DG-AK15	6	0.5-1	DG-AK15S-0.5-1	1/23/2019	**17 J**	**20 J**	**32**	**9.2 J**	**30**	**4.5 J**	**12 J**	**31**	**9.6 J**	<3.9	**4.0 J**	**3.9 J**	**12 J**	**35**	<3.9	**11 J**	**61**	**36**	**14**	**20**
DG-AK15	6	3.5-4	DG-AK15S-3.5-4	1/23/2019	**230 J**	**140 J**	**390 J**	**83 J**	**600 J+**	<78	<78	**246**	<78	<78	**190 J**	**89 J**	<78	**590 J+**	<78	<78	**150 J**	**850 J+**	**140**	**93**
DG-AM15	6	0.5-1	DG-AM15S-0.5-1	1/23/2019	**9.1 J**	**8.4 J**	**16 J**	**4.6 J**	**12 J**	<4.0	**4.7 J**	**13**	**8.4 J**	<4.0	<4.0	<4.0	**4.9 J**	**16 J**	<4.0	**11 J**	**15 J**	**15 J**	**8.3**	**13**
DG-AM15	6	3.5-4	DG-AM15S-3.5-4	1/23/2019	**39**	**49**	**62**	**21 J**	**48**	**7.4 J**	**25 J**	**69**	<3.9	<3.9	**7.5 J**	**9.8 J**	**24 J**	**54**	<3.9	<3.9	**23 J**	**67**	**16**	**18**
DG-AM15	6	9.5-10	DG-AM15S-9.5-10	1/23/2019	<3.9 UJ	<3.9	**4.2 J**	<3.9	**6.7 J**	<3.9	<3.9	**5**	<3.9	<3.9	<3.9	<3.9	<3.9	**6.4 J**	<3.9	<3.9	**4.1 J**	**20 J**	**20 J**	**14 J**
DG-AM15 (D)	6	9.5-10	DG-AM15 (D)S-9.5-10	1/23/2019	**4.1 J**	<3.9	**4.8 J**	<3.9	**5.2 J**	<3.9	<3.9	**5**	<3.9	<3.9	<3.9	<3.9	<3.9	**7.4 J**	<3.9	<3.9	<3.9 UJ	**18 J**	**5.1 J**	**4.1 J**
DG-AP13	6	0.5-1	DG-AP13S-0.5-1	1/23/2019	**23 J**	**27 J**	**34 J**	**10 J**	**39 J**	<8.0	**18 J**	**39**	<8.0	<8.0	<8.0	<8.0	**23 J**	**63 J**	<8.0	<8.0	**53 J**	**78 J**	**130 J**	**270 J**

Table 3: Polynuclear Aromatic Hydrocarbons and TPH as Diesel and Motor Oil Concentrations in Soil
Brisbane Baylands OU-2
Brisbane, California

Sample Location	Investigation Zone	Depth Range (ft bgs)	Sample Name	Collection Date	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Chrysene	Dibenzo(a,h)anthracene	Indeno(1,2,3-cd)pyrene	Benzo(a)pyrene Equivalent Total PAHs [4]	2-Methylnaphthalene	Acenaphthene	Acenaphthylene	Anthracene	Benzo(g,h,i)perylene	Fluoranthene	Fluorene	Naphthalene	Phenanthrene	Pyrene	TPH-Diesel (C10-C28)	TPH-Motor Oil (C24-C36)
Direct Exposure Human Health Risk Level Residential Soil Exposure ESL [1]					1.1E+03	1.1E+02	1.1E+03	1.1E+04	1.1E+05	1.1E+02	1.1E+03	--	2.4E+05	3.6E+06	--	1.8E+07	--	2.4E+06	2.4E+06	3.8E+03	--	1.8E+06	2.6E+02	1.2E+04
Leaching to Groundwater Levels Non-drinking Water ESL [2]					1.0E+04	5.7E+03	7.5E+04	3.9E+04	1.0E+04	3.9E+05	3.2E+04	--	8.8E+02	1.2E+04	6.4E+03	1.9E+03	2.7E+04	8.6E+04	6.0E+03	1.2E+03	1.1E+04	4.5E+04	7.3E+03	--
Regional Background [3]					--	--	--	--	--	--	--	9.0E+02	--	--	--	--	--	--	--	--	--	--	--	--
Units					µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	mg/kg	mg/kg
DG-AP13 (D)	6	0.5-1	DG-AP13 (D)S-0.5-1	1/23/2019	**11 J**	**15 J**	**20 J**	**5.8 J**	**17 J**	<3.9	**9.5 J**	**21**	<3.9	<3.9	<3.9	<3.9	**11 J**	**29 J**	<3.9	**4.0 J**	**17 J**	**36 J**	**40 J**	**69 J**
DG-AP13	6	3.5-4	DG-AP13S-3.5-4	1/23/2019	<4.0	<4.0	**4.5 J**	<4.0	**5.2 J**	<4.0	<4.0	**5**	<4.0	<4.0	<4.0	<4.0	<4.0	**8.1 J**	<4.0	**6.7 J**	**5.9 J**	**8.9 J**	**11**	**17**
DG-AP13	6	9.5-10	DG-AP13S-9.5-10	1/23/2019	<4.0	<4.0	<4.0	<4.0	**4.5 J**	<4.0	<4.0	**5**	<4.0	<4.0	<4.0	<4.0	<4.0	**5.2 J**	<4.0	**8.0 J**	**17 J**	<4.0	**10**	**8**
DG-AR13	6	0.5-1	DG-AR13S-0.5-1	1/23/2019	**110 J**	**180 J**	**210 J**	**66 J**	**140 J**	<40	**140 J**	**247**	<40	<40	<40	<40	**170 J**	**320**	<40	<40	**160 J**	**380**	**48 J**	**120**
DG-AR13	6	3.5-4	DG-AR13S-3.5-4	1/23/2019	**19 J**	**19 J**	**26 J**	**7.8 J**	**21 J**	**4.0 J**	**10 J**	**29**	<4.0	<4.0	<4.0	<4.0	**10 J**	**30**	<4.0	<4.0	**13 J**	**38**	**14**	**23**
DG-AR13	6	9.5-10	DG-AR13S-9.5-10	1/23/2019	<3.9	**5.2 J**	**16 J**	<3.9	**9.5 J**	<3.9	**17 J**	**11**	<3.9	<3.9	<3.9	<3.9	**20 J**	**9.3 J**	<3.9	**11 J**	**10 J**	**6.2 J**	**3.8 J**	**4.1 J**
DG-AS11	6	0.5-1	DG-AS11S-0.5-1	1/31/2019	<150	**460 J+**	**590 J+**	**490 U**	**190 J+**	<340	<410	**722**	<490	<280	<240	<200	**510 J+**	**400 J+**	<220	<340	**190 J+**	**460 J+**	**2,000**	**2,700**
DG-AS11	6	3.5-4	DG-AS11S-3.5-4	1/31/2019	**130**	**120**	**240**	**72**	**130**	**43 J**	**82**	**209**	<49	<27	<23	**29 J**	**90**	**220**	<21	**54**	**90**	**190**	**53**	**76**
DG-AS11	6	7.5-8	DG-AS11S-7.5-8	1/31/2019	<1.5	**2.7 J**	**6**	**4.9 U**	**4.1 J**	<3.5	<4.2	**5**	<4.9	<2.8	<2.4	<2.0	<4.2	**6.1**	<2.2	**7.4**	**11**	**4.4 J**	**11**	**11**
DG-AT12	6	0.5-1	DG-AT12S-0.5-1	1/23/2019	**44 J**	**48 J**	**65**	**22 J**	**80**	**8.4 J**	**43 J**	**72**	**8.8 J**	<8.0	**8.8 J**	**11 J**	**52 J**	**99**	**11 J**	<8.0	**88**	**110**	**56**	**54**
DG-AT12	6	3.5-4	DG-AT12S-3.5-4	1/23/2019	**870**	**840**	**1,100**	**410**	**1,100**	**140**	**640**	**1,246**	**13 J**	**17 J**	**56 J**	**130**	**670**	**1,200**	**22 J**	**19 J**	**500**	**1,400**	**390**	**300**
DG-AT12	6	9.5-10	DG-AT12S-9.5-10	1/23/2019	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	**5**	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	**5.8**	**5.0 U**
DG-AU11	6	0.5-1	DG-AU11S-0.5-1	1/23/2019	**8.6 J**	**10 J**	**18 J**	**5.2 J**	**14 J**	<3.9	**6.5 J**	**15**	<3.9	<3.9	<3.9	<3.9	**7.8 J**	**16 J**	<3.9	<3.9	**7.9 J**	**17 J**	**33**	**83**
DG-AU11	6	3.5-4	DG-AU11S-3.5-4	1/23/2019	**280**	**240**	**400**	**160**	**360**	**33**	**130**	**356**	**6.8 J**	**12 J**	**43**	**42**	**100**	**380**	**13 J**	**10 J**	**160**	**340**	**26**	**39**
DG-AU11	6	9.5-10	DG-AU11S-9.5-10	1/23/2019	**110**	**120**	**170**	**64**	**130**	**25 J**	**84**	**182**	**4.6 J**	<4.0	<4.0	<4.0	**67**	**120**	<4.0	**36**	**47**	**120**	**16**	**9.3**
DG-AW11	6	0.5-1	DG-AW11S-0.5-1	1/23/2019	**27 J**	**39 J**	**47 J**	**15 J**	**41 J**	<7.9	**29 J**	**53**	<7.9	<7.9	<7.9	<7.9	**38 J**	**61**	<7.9	<7.9	**36 J**	**66**	**110**	**180**
DG-AW11	6	3.5-4	DG-AW11S-3.5-4	1/23/2019	<39	<39	**40 J**	<39	<39	<39	<39	**47**	<39	<39	<39	<39	<39	**45 J**	<39	<39 R	<39	**44 J**	**47**	**84**
DG-AW11	6	7.5-8	DG-AW11S-7.5-8	1/23/2019	<39 U	<39 U	<39 U	<39 U	**300**	<39 U	<39 U	**45**	<39 U	<39	<39 U	<39	<39 U	<39 U	<39 U	<39	<39	**150 J**	**1,600**	**1,700**

Table 3: Polynuclear Aromatic Hydrocarbons and TPH as Diesel and Motor Oil Concentrations in Soil
Brisbane Baylands OU-2
Brisbane, California

Notes:

1. San Francisco Bay RWQCB, 2019. Summary of Soil ESLs, Jan. 2019 (Rev. 1) - Direct Exposure Human Health Risk Levels (Table S-1) Res: Shallow Soil Exposure.
2. San Francisco Bay RWQCB, 2019. Summary of Soil ESLs, Jan. 2019 (Rev. 1) - Leaching to Groundwater Levels (Table S-3) Non-drinking Water.
3. For Benzo(a)pyrene Equivalent PAHs: DTSC, 2009. 95th percentile benzo(a)pyrene equivalent for ambient concentrations in northern California.
4. Total PAHs calculated based on the PEA Guidance Manual, Potency Equivalecy Factors for PAHs - Table 2-4.

- The lower RWQCB ESL is used as comparison criteria when available unless the regional background is higher, in which case regional background is used as the comparison criteria. The carcinogenic PAHs (benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene and indeno(1,2,3-cd)pyrene) were converted to total PAHs and that comparison criteria was used rather than individual ESLs.
- PAHs analyzed by USEPA Method 8270C SIM.
- TPH-diesel and TPH-motor oil analyzed by USEPA Method 8015B.
- Non-detect results are presented with "<" followed by the MDL.
- Results in bold font indicate a detection above the MDL.
- Gray shading indicates a detection above the comparison criteria.

Abbreviations and Symbols:

"J" - Analyte was detected but the associated numerical value is the approximate concentration.
"J+" - Analyte was detected but the associated numerical value is likely to be higher than the concentration of the analyte in the sample due to positive bias of associated QC or calibration data or attributable to matrix interference.
"J-" - Analyte was detected but the associated numerical value is likely to be lower than the concentration of the analyte in the sample due to negative bias of associated QC or calibration data or attributable to matrix interference.
"R" - The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.
"U" - Not detected at or above the reported result.
"UJ" - The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
"--" - Not Available
"<" - Non-detect result
(D) - Duplicate sample
ESL - Environmental Screening Level
ft bgs - Feet below ground surface
MDL - Method Detection Limit
mg/kg - milligram per kilogram
PAHs - Polynuclear Aromatic Hydrocarbons
QC - quality control
RWQCB - Regional Water Quality Control Board
SIM - selective ion monitoring
TPH - Total petroleum hydrocarbon
USEPA - United States Environmental Protection Agency

Table 4: Organochlorine Pesticides and Polychlorinated Biphenyls Concentrations in Soil
Brisbane Baylands OU-2
Brisbane, California

Sample Location	Investigation Zone	Depth Range (ft bgs)	Sample Name	Collection Date	4,4'-DDD	4,4'-DDE	4,4'-DDT	alpha-BHC	alpha-Chlordane	beta-BHC	Chlordane	Dieldrin	Endrin	Endrin aldehyde	Endrin ketone	gamma-BHC (Lindane)	gamma-Chlordane	PCB-1254 (Aroclor 1254)	PCB-1260 (Aroclor 1260)
Direct Exposure Human Health Risk Level Residential Soil Exposure ESL [1]					2.7E+03	1.8E+03	1.9E+03	--	--	--	4.8E+02	3.7E+01	2.1E+04	--	--	5.50E+02	--	2.30E+02	
Leaching to Groundwater Levels Non-drinking Water ESL [2]					6.5E+04	2.9E+04	5.6E+03	--	--	--	2.3E+04	6.3E+00	7.6E+00	--	--	7.4E+00	--	3.3E+05	
USEPA RSL for Resident Soil [3]					1.9E+03	2.0E+03	1.9E+03	8.6E+01	1.7E+03	3.0E+02	1.7E+03	3.4E+01	1.9E+04	--	--	5.7E+02	1.7E+03	2.4E+02	2.4E+02
Units					µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg
DG-N1	1	0.5-1	DG-N1S-0.5-1	12/18/2018	<0.60	**2.7**	**10**	<0.54	**1.4 J**	<0.35	<2.8	<0.58	<0.45	<0.62	<0.32	<0.62	<0.45	<17	**50**
DG-N1	1	3.5-4	DG-N1S-3.5-4	12/18/2018	<0.61	<0.42	<0.41	<0.55	<0.40	<0.36	<2.9	<0.59	<0.46	<0.63	<0.33	<0.63	<0.46	<17	<17
DG-N5	1	0.5-1	DG-N5S-0.5-1	1/8/2019	<0.61	**0.83**	<0.41	<0.55	<0.40	<0.36	<3.2	<0.59	<0.46	<0.63	<0.33	<0.63	<0.46	<17	<17
DG-N5 (D)	1	0.5-1	DG-N5 (D)S-0.5-1	1/8/2019	<0.58	<0.40	<0.39	<0.52	<0.38	<0.34	<3.0	<0.56	<0.44	<0.60	<0.31	<0.60	<0.44	**200**	**160**
DG-N5 (D)	1	0.5-1	DG-N5 (D)S-0.5-1	1/24/2019	<1.5	<1.5	<1.5	<1.5	<2.0	<1.5	<9.9	<1.5	<1.5	<1.5	<2.0	<1.5	<1.5	<17	<17
DG-N5	1	3.5-4	DG-N5S-3.5-4	1/8/2019	<0.59	<0.41	<0.40	<0.54	<0.39	<0.35	<2.8	<0.57	<0.45	<0.61	<0.32	<0.61	<0.45	<17	<17
DG-O3	1	0.5-1	DG-O3S-0.5-1	12/18/2018	<0.60	<0.42	<0.41	<0.54	<0.40	<0.36	<3.2	<0.58	<0.46	<0.62	<0.33	<0.62	<0.46	<17	<17
DG-O3	1	3.5-4	DG-O3S-3.5-4	12/18/2018	<0.58	<0.40	<0.39	<0.52	<0.38	<0.34	<3.0	<0.56	<0.44	<0.60	<0.31	<0.60	<0.44	<17	<17
DG-P1	1	0.5-1	DG-P1S-0.5-1	11/21/2018	<0.58	<0.40	<0.39	<0.53	<0.38	<0.35	<3.1	<0.57	<0.44	<0.60	<0.32	<0.60	<0.44	<17	<17
DG-P1	1	3.5-4	DG-P1S-3.5-4	11/21/2018	<0.58	<0.40	<0.39	<0.52	<0.38	<0.34	<3.0	<0.56	<0.44	<0.60	<0.31	<0.60	<0.44	<17	<17
DG-P1 (D)	1	3.5-4	DG-P1 (D)S-3.5-4	11/21/2018	<0.59	<0.40	<0.39	<0.53	<0.39	<0.35	<3.1	<0.57	<0.44	<0.61	<0.32	<0.61	<0.44	<17	<17
DG-P5	1	0.5-1	DG-P5S-0.5-1	1/8/2019	<0.60	**0.88**	<0.40	<0.54	**1**	<0.35	<3.1	<0.58	<0.45	<0.62	<0.32	<0.62	<0.45	<17	**110**
DG-P5	1	3.5-4	DG-P5S-3.5-4	1/8/2019	<0.59	<0.41	<0.40	<0.54	<0.39	<0.35	<3.1	<0.57	<0.45	<0.61	<0.32	<0.61	<0.45	<17	<17
DG-Q3	1	0.5-1	DG-Q3S-0.5-1	12/18/2018	<0.60	<0.41	<0.40	<0.54	<0.39	<0.35	<2.8	<0.58	<0.45	<0.62	<0.32	<0.62	<0.45	<17	<17
DG-Q3	1	3.5-4	DG-Q3S-3.5-4	12/18/2018	<0.59	<0.41	<0.40	<0.53	<0.39	<0.35	<3.1	<0.57	<0.45	<0.61	<0.32	<0.61	<0.45	<17	<17
DG-Q7	1	0.5-1	DG-Q7S-0.5-1	1/8/2019	<0.60	<0.41	<0.40	<0.54	<0.39	<0.35	<3.1	<0.58	<0.45	<0.62	<0.32	<0.62	<0.45	<17	<17
DG-Q7	1	3.5-4	DG-Q7S-3.5-4	1/8/2019	<0.58	<0.40	<0.39	<0.52	<0.38	<0.34	<3.0	<0.56	<0.44	<0.60	<0.31	<0.60	<0.44	<17	<17
DG-Q7 (D)	1	3.5-4	DG-Q7 (D)S-3.5-4	1/8/2019	<0.58	**5.1**	<0.39	<0.53	**1.6**	<0.34	<3.1	<0.56	<0.44	<0.60	<0.32	<0.60	<0.44	<17	**520**
DG-R1	1	0.5-1	DG-R1S-0.5-1	12/17/2018	<0.58	<0.40	<0.39	<0.53	**1.2 J**	<0.34	<3.1	<0.56	<0.44	<0.60	<0.32	<0.60	<0.44	<17	**53**
DG-R1	1	3.5-4	DG-R1S-3.5-4	12/17/2018	<0.59	<0.41	<0.40	<0.53	<0.39	<0.35	<2.8	<0.57	<0.45	<0.61	<0.32	<0.61	<0.45	<17	<17
DG-R5	1	0.5-1	DG-R5S-0.5-1	1/29/2019	**1.5 J**	**18**	**17**	<0.54	<0.39	<0.35	<3.1	<0.58	<0.45	<0.62	<0.32	<0.62	<0.45	<17	**89**
DG-R5	1	3.5-4	DG-R5S-3.5-4	1/29/2019	<0.60	<0.41	<0.40	<0.54	<0.39	<0.35	<3.1	<0.58	<0.45	<0.62	<0.32	<0.62	<0.45	<17	<17
DG-R5 (D)	1	3.5-4	DG-R5 (D)S-3.5-4	1/29/2019	<0.60	<0.41	<0.40	<0.54	<0.39	<0.35	<3.2	<0.58	<0.45	<0.62	<0.33	<0.62	<0.45	<17	<17
DG-S3	1	0.5-1	DG-S3S-0.5-1	12/18/2018	<0.60	<0.41	<0.40	<0.54	<0.39	<0.35	<3.1	<0.58	<0.45	<0.62	<0.32	<0.62	<0.45	<17	<17
DG-S3	1	3.5-4	DG-S3S-3.5-4	12/18/2018	<1.2	<0.82	<0.80	<1.1	<0.78	<0.70	<6.2	<1.2	<0.90	<1.2	<0.64	<1.2	<0.90	<17	<17
DG-S7	1	0.5-1	DG-S7S-0.5-1	1/8/2019	<0.58	<0.40	<0.39	<0.53	<0.38	<0.34	<2.8	<0.56	<0.44	<0.60	<0.32	<0.60	<0.44	<17	**380**
DG-S7	1	3.5-4	DG-S7S-3.5-4	1/8/2019	<0.59	<0.41	<0.40	<0.54	<0.39	<0.35	<2.8	<0.57	<0.45	<0.61	<0.32	<0.61	<0.45	<170	**5300**
DG-T1	1	0.5-1	DG-T1S-0.5-1	12/17/2018	<0.60	<0.41	<0.40	<0.54	<0.39	<0.35	<2.8	<0.58	<0.45	<0.62	<0.32	<0.62	<0.45	<17	<17
DG-T1	1	3.5-4	DG-T1S-3.5-4	12/17/2018	<0.61	<0.42	<0.41	<0.55	<0.40	<0.36	<3.2	<0.59	<0.46	<0.63	<0.33	<0.63	<0.46	<17	<17
DG-T1 (D)	1	3.5-4	DG-T1 (D)S-3.5-4	12/17/2018	<0.61	<0.42	<0.41	<0.55	<0.40	<0.36	<2.9	<0.59	<0.46	<0.63	<0.33	<0.63	<0.46	<17	<17
DG-T5	1	0.5-1	DG-T5S-0.5-1	1/8/2019	<0.59	<0.41	<0.40	<0.53	<0.39	<0.35	<2.8	<0.57	<0.44	<0.61	<0.32	<0.61	<0.44	<17	<17
DG-T5	1	3.5-4	DG-T5S-3.5-4	1/8/2019	<0.60	<0.41	<0.40	<0.54	<0.39	<0.35	<2.8	<0.58	<0.45	<0.62	<0.32	<0.62	<0.45	<17	<17
DG-U3	1	0.5-1	DG-U3S-0.5-1	12/18/2018	<0.58	<0.40	**7.1 J**	<0.52	<0.38	<0.34	<3.0	<0.56	<0.44	<0.60	<0.31	<0.60	<0.44	<17	**33 J**
DG-U3	1	3.5-4	DG-U3S-3.5-4	12/18/2018	<0.60	<0.41	<0.40	<0.54	<0.39	<0.35	<2.8	<0.58	<0.45	<0.62	<0.32	<0.62	<0.45	<17	<17
DG-U7	1	0.5-1	DG-U7S-0.5-1	1/8/2019	<0.58	**0.8**	<0.39	<0.53	<0.38	<0.34	<2.8	<0.56	<0.44	<0.60	<0.32	<0.60	<0.44	<17	<17
DG-U7	1	3.5-4	DG-U7S-3.5-4	1/8/2019	<0.60	<0.41	<0.40	<0.54	<0.39	<0.35	<3.1	<0.58	<0.45	<0.62	<0.32	<0.62	<0.45	<17	**19**
DG-V1	1	0.5-1	DG-V1S-0.5-1	12/17/2018	<0.60	<0.41	<0.40	<0.54	<0.39	<0.36	<3.2	<0.58	<0.45	<0.62	<0.33	<0.62	<0.45	<17	<17
DG-V1	1	3.5-4	DG-V1S-3.5-4	12/17/2018	<0.58	<0.40	<0.39	<0.53	<0.38	<0.34	<2.8	<0.56	<0.44	<0.60	<0.32	<0.60	<0.44	<17	<17

Table 4: Organochlorine Pesticides and Polychlorinated Biphenyls Concentrations in Soil
Brisbane Baylands OU-2
Brisbane, California

Sample Location	Investigation Zone	Depth Range (ft bgs)	Sample Name	Collection Date	4,4'-DDD	4,4'-DDE	4,4'-DDT	alpha-BHC	alpha-Chlordane	beta-BHC	Chlordane	Dieldrin	Endrin	Endrin aldehyde	Endrin ketone	gamma-BHC (Lindane)	gamma-Chlordane	PCB-1254 (Aroclor 1254)	PCB-1260 (Aroclor 1260)
Direct Exposure Human Health Risk Level Residential Soil Exposure ESL [1]					2.7E+03	1.8E+03	1.9E+03	--	--	--	4.8E+02	3.7E+01	2.1E+04	--	--	5.50E+02	--	2.30E+02	
Leaching to Groundwater Levels Non-drinking Water ESL [2]					6.5E+04	2.9E+04	5.6E+03	--	--	--	2.3E+04	6.3E+00	7.6E+00	--	--	7.4E+00	--	3.3E+05	
USEPA RSL for Resident Soil [3]					1.9E+03	2.0E+03	1.9E+03	8.6E+01	1.7E+03	3.0E+02	1.7E+03	3.4E+01	1.9E+04	--	--	5.7E+02	1.7E+03	2.4E+02	2.4E+02
Units					µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg
DG-V5	1	0.5-1	DG-V5S-0.5-1	1/8/2019	<0.59	<0.41	<0.40	<0.53	<0.39	<0.35	<3.1	<0.57	<0.45	<0.61	<0.32	<0.61	<0.45	<17	<17
DG-V5	1	3.5-4	DG-V5S-3.5-4	1/8/2019	<0.59	<0.40	<0.39	<0.53	<0.38	<0.35	<3.1	<0.57	<0.44	<0.61	<0.32	<0.61	<0.44	<17	<17
DG-V5	1	7.5-8	DG-V5S-7.5-8	1/8/2019	<0.59	<0.40	<0.39	<0.53	<0.38	<0.35	<3.1	<0.57	<0.44	<0.60	<0.32	<0.60	<0.44	<17	<17
DG-V9	1	0.5-1	DG-V9S-0.5-1	1/10/2019	<0.60	<0.41	<0.40	<0.54	<0.39	<0.35	<3.1	<0.58	<0.45	<0.62	<0.32	<0.62	<0.45	<17	<17
DG-V9	1	3.5-4	DG-V9S-3.5-4	1/10/2019	<0.59	<0.41	<0.40	<0.53	<0.39	<0.35	<3.1	<0.57	<0.45	<0.61	<0.32	<0.61	<0.45	<17	<17
DG-V9	1	7.5-8	DG-V9S-7.5-8	1/10/2019	<0.60	<0.41	<0.40	<0.54	<0.39	<0.35	<3.1	<0.58	<0.45	<0.62	<0.32	<0.62	<0.45	<17	<17
DG-W3	1	0.5-1	DG-W3S-0.5-1	2/5/2019	<0.60	<0.41	<0.40	<0.54	<0.39	<0.35	<3.2	<0.58	<0.45	<0.62	<0.33	<0.62	<0.45	<17	<17
DG-W3	1	3.5-4	DG-W3S-3.5-4	2/5/2019	<0.61	<0.42	<0.41	<0.55	<0.40	<0.36	<3.2	<0.59	<0.46	<0.63	<0.33	<0.63	<0.46	<17	<17
DG-W7	1	0.5-1	DG-W7S-0.5-1	1/29/2019	<0.60	<0.42	<0.41	<0.54	<0.40	<0.36	<3.2	<0.58	<0.46	<0.62	<0.33	<0.62	<0.46	<17	**47 J**
DG-W7	1	3.5-4	DG-W7S-3.5-4	1/29/2019	<0.60	<0.41	<0.40	<0.54	<0.39	<0.35	<3.1	<0.58	<0.45	<0.62	<0.32	<0.62	<0.45	<17	<17
DG-X1	1	0.5-1	DG-X1S-0.5-1	12/17/2018	<0.58	<0.40	<0.39	<0.52	<0.38	<0.34	<3.0	<0.56	<0.44	<0.60	<0.31	<0.60	<0.44	<17	<17
DG-X1 (D)	1	0.5-1	DG-X1 (D)S-0.5-1	12/17/2018	<0.58	<0.40	<0.39	<0.52	<0.38	<0.34	<2.8	<0.56	<0.44	<0.60	<0.31	<0.60	<0.44	<17	<17
DG-X1	1	3.5-4	DG-X1S-3.5-4	12/17/2018	<0.59	<0.41	<0.40	<0.54	<0.39	<0.35	<2.8	<0.57	<0.45	<0.61	<0.32	<0.61	<0.45	<17	<17
DG-X5	1	0.5-1	DG-X5S-0.5-1	1/8/2019	<0.58	<0.40	<0.39	<0.52	<0.38	<0.34	<2.8	<0.56	<0.44	<0.60	<0.31	<0.60	<0.44	<17	**90**
DG-X5	1	3.5-4	DG-X5S-3.5-4	1/8/2019	<0.59	<0.41	<0.40	<0.53	<0.39	<0.35	<3.1	<0.57	<0.45	<0.61	<0.32	<0.61	<0.45	<17	<17
DG-X9	1	0.5-1	DG-X9S-0.5-1	1/10/2019	<0.59	<0.41	<0.40	<0.53	<0.39	<0.35	<3.1	<0.57	<0.44	<0.61	<0.32	<0.61	<0.44	<17	<17
DG-X9	1	3.5-4	DG-X9S-3.5-4	1/10/2019	<0.59	<0.41	<0.40	<0.54	<0.39	<0.35	<3.1	<0.58	<0.45	<0.61	<0.32	**20**	<0.45	<17	<17
DG-Y3	1	0.5-1	DG-Y3S-0.5-1	2/5/2019	**7.1 J**	**4.5 J**	**35 J**	<1.1	<0.78	<0.71	<6.3	**25 J**	<0.90	<1.2	<0.65	<1.2	<0.90	<17	**210 J+**
DG-Y3	1	3.5-4	DG-Y3S-3.5-4	2/5/2019	<0.58	<0.40	<0.39	<0.52	<0.38	<0.34	<3.0	<0.56	<0.44	<0.60	<0.31	<0.60	<0.44	<17	<17
DG-Y7	1	0.5-1	DG-Y7S-0.5-1	1/9/2019	**1**	<0.41	<0.40	<0.54	<0.39	<0.35	<3.1	<0.58	<0.45	<0.61	<0.32	<0.61	<0.45	<17	**84**
DG-Y7	1	3.5-4	DG-Y7S-3.5-4	1/9/2019	<0.60	<0.42	<0.41	<0.54	<0.40	<0.36	<3.2	<0.58	<0.45	<0.62	<0.33	<0.62	<0.45	<16	<16
DG-Z5	1	0.5-1	DG-Z5S-0.5-1	1/8/2019	<0.61	<0.42	<0.41	<0.55	<0.40	<0.36	<2.9	<0.59	<0.46	<0.63	<0.33	<0.63	<0.46	<17	<17
DG-Z5	1	3.5-4	DG-Z5S-3.5-4	1/8/2019	<0.58	<0.40	<0.39	<0.53	<0.38	<0.34	<2.8	<0.56	<0.44	<0.60	<0.32	<0.60	<0.44	<17	<17
DG-Z9	1	0.5-1	DG-Z9S-0.5-1	1/9/2019	**1.4**	**1.2**	**3.3**	<0.53	<0.38	<0.35	<3.1	**1**	**2.8**	<0.60	<0.32	<0.60	<0.44	<17	**49**
DG-Z9 (D)	1	0.5-1	DG-Z9 (D)S-0.5-1	1/9/2019	<0.57	<0.39	**13**	<0.52	<0.38	<0.34	<3.0	<0.55	<0.43	<0.59	<0.31	<0.59	<0.43	<17	**23**
DG-Z9	1	3.5-4	DG-Z9S-3.5-4	1/9/2019	<0.57	<0.39	<0.39	<0.52	<0.38	<0.34	<3.0	<0.55	<0.43	<0.59	<0.31	**4.4**	<0.43	<17	<17
DG-AA3	1	0.5-1	DG-AA3S-0.5-1	2/5/2019	**1.7 J**	**1.9**	**3.8 J**	<0.52	**0.57 J**	<0.34	**9.7 J**	**2.0 J**	<0.44	<0.60	<0.31	<0.60	**0.82 J**	<17	**270 J+**
DG-AA3	1	3.5-4	DG-AA3S-3.5-4	2/5/2019	<0.60	<0.41	<0.40	<0.54	<0.39	<0.36	<3.2	<0.58	<0.45	<0.62	<0.33	<0.62	<0.45	<17	**19 J**
DG-AA3	1	7-7.5	DG-AA3S-7-7.5	2/5/2019	<0.58	<0.40	<0.39	<0.52	<0.38	<0.34	<3.0	<0.56	<0.44	<0.60	<0.31	<0.60	<0.44	<17	<17
DG-AA7	1	0.5-1	DG-AA7S-0.5-1	1/9/2019	**2.2**	**1.3**	**4.7**	<0.54	**0.67**	<0.35	<3.1	**4.9**	<0.45	<0.62	<0.32	<0.62	**0.9**	<17	**710**
DG-AA7	1	3.5-4	DG-AA7S-3.5-4	1/9/2019	<0.60	<0.41	<0.40	<0.54	<0.39	<0.36	<3.2	<0.58	<0.45	<0.62	<0.33	<0.62	<0.45	<17	**21**
DG-AB5	1	0.5-1	DG-AB5S-0.5-1	1/29/2019	<0.60	<0.42	<0.41	<0.54	<0.40	<0.36	<3.2	<0.58	<0.45	<0.62	<0.33	<0.62	<0.45	<17	<17
DG-AB5 (D)	1	0.5-1	DG-AB5 (D)S-0.5-1	1/29/2019	<0.60	<0.41	<0.40	<0.54	<0.39	<0.35	<3.1	<0.58	<0.45	<0.62	<0.32	<0.62	<0.45	<17	<17
DG-AB5	1	3.5-4	DG-AB5S-3.5-4	1/29/2019	<0.60	<0.41	<0.40	<0.54	<0.39	<0.35	<3.1	<0.58	<0.45	<0.62	<0.32	<0.62	<0.45	<17	<17
DG-AB9	1	0.5-1	DG-AB9S-0.5-1	1/30/2019	<1.5	<1.5	<1.5	<1.5	<2.0	<1.5	<9.9	<1.5	<1.5	<1.5	<2.0	<1.5	<1.5	<17	<17
DG-AB9	1	3.5-4	DG-AB9S-3.5-4	1/30/2019	<1.5	<1.5	<1.5	<1.5	<2.0	<1.5	<9.8	<1.5	<1.5	<1.5	<2.0	<1.5	<1.5	<17	<17
DG-AC3	1	0.5-1	DG-AC3S-0.5-1	12/19/2018	<0.58 U	<0.40	<0.39	<0.52	<0.38	<0.34	<3.1	<0.56	<0.44	<0.60 U	<0.31	<0.60	<0.44	<17	<17
DG-AC3	1	3.5-4	DG-AC3S-3.5-4	12/19/2018	<0.61	<0.42	<0.41	<0.55	<0.40	<0.36	<2.9	<0.59	<0.46	<0.63	<0.33	<0.63	<0.46	<17	**23 J**

Table 4: Organochlorine Pesticides and Polychlorinated Biphenyls Concentrations in Soil
Brisbane Baylands OU-2
Brisbane, California

Sample Location	Investigation Zone	Depth Range (ft bgs)	Sample Name	Collection Date	4,4'-DDD	4,4'-DDE	4,4'-DDT	alpha-BHC	alpha-Chlordane	beta-BHC	Chlordane	Dieldrin	Endrin	Endrin aldehyde	Endrin ketone	gamma-BHC (Lindane)	gamma-Chlordane	PCB-1254 (Aroclor 1254)	PCB-1260 (Aroclor 1260)
Direct Exposure Human Health Risk Level Residential Soil Exposure ESL [1]					2.7E+03	1.8E+03	1.9E+03	--	--	--	4.8E+02	3.7E+01	2.1E+04	--	--	5.50E+02	--	2.30E+02	
Leaching to Groundwater Levels Non-drinking Water ESL [2]					6.5E+04	2.9E+04	5.6E+03	--	--	--	2.3E+04	6.3E+00	7.6E+00	--	--	7.4E+00	--	3.3E+05	
USEPA RSL for Resident Soil [3]					1.9E+03	2.0E+03	1.9E+03	8.6E+01	1.7E+03	3.0E+02	1.7E+03	3.4E+01	1.9E+04	--	--	5.7E+02	1.7E+03	2.4E+02	2.4E+02
Units					µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg
DG-AC7	1	0.5-1	DG-AC7S-0.5-1	1/9/2019	<0.60	**0.48**	<0.40	<0.54	<0.39	<0.35	<3.1	<0.58	<0.45	<0.62	<0.32	<0.62	<0.45	<16	**190**
DG-AC7 (D)	1	0.5-1	DG-AC7 (D)S-0.5-1	1/9/2019	<0.60	**0.89**	<0.40	<0.54	<0.39	<0.36	<3.2	<0.58	<0.45	<0.62	<0.33	<0.62	<0.45	<16	**120**
DG-AC7	1	3.5-4	DG-AC7S-3.5-4	1/9/2019	<3.0	<2.1	<2.0	<2.7	<2.0	<1.8	<16	<2.9	<2.3	<3.1	<1.6	<3.1	<2.3	<17	<17
DG-AC7	1	7.5-8	DG-AC7S-7.5-8	1/9/2019	<0.60	<0.41	<0.40	<0.54	<0.39	<0.35	<3.1	<0.58	<0.45	<0.62	<0.32	<0.62	<0.45	<17	<17
DG-AD5	1	0.5-1	DG-AD5S-0.5-1	1/8/2019	<0.60	<0.41	<0.40	<0.54	<0.39	<0.36	<3.2	<0.58	<0.45	<0.62	<0.33	<0.62	<0.45	<17	**99**
DG-AD5	1	3.5-4	DG-AD5S-3.5-4	1/8/2019	<0.60	<0.41	<0.40	<0.54	<0.39	<0.35	<2.8	<0.58	<0.45	<0.62	<0.32	<0.62	<0.45	<17	<17
DG-AD9	1	0.5-1	DG-AD9S-0.5-1	1/9/2019	**9**	**4.9**	**12**	<0.53	<0.38	<0.34	<3.1	**6.6**	**12**	<0.60	<0.32	<0.60	<0.44	<17	**200**
DG-AD9	1	3.5-4	DG-AD9S-3.5-4	1/9/2019	<0.60	<0.41	<0.40	**1**	<0.39	<0.35	<3.1	<0.58	<0.45	<0.62	<0.32	<0.62	<0.45	<17	<17
DG-AE3	1	0.5-1	DG-AE3S-0.5-1	12/19/2018	<0.61	<0.42	<0.41	<0.55	<0.40	<0.36	<3.2	<0.59	<0.46	<0.63	<0.33	<0.63	<0.46	<17	<17
DG-AE3	1	3.5-4	DG-AE3S-3.5-4	12/19/2018	<0.60	<0.42	<0.41	<0.54	<0.40	<0.36	<3.2	<0.58	<0.46	<0.62	<0.33	<0.62	<0.46	<17	<17
DG-AE7	1	0.5-1	DG-AE7S-0.5-1	1/9/2019	<0.60	<0.41	<0.40	<0.54	<0.39	<0.35	<3.1	<0.58	<0.45	<0.62	<0.32	<0.62	<0.45	<17	<17
DG-AE7	1	3.5-4	DG-AE7S-3.5-4	1/9/2019	<0.60	<0.41	<0.40	<0.54	<0.39	<0.35	<3.2	<0.58	<0.45	<0.62	<0.33	<0.62	<0.45	<17	<17
DG-AE7	1	8-8.5	DG-AE7S-8-8.5	1/9/2019	<0.60	<0.41	<0.40	<0.54	<0.39	<0.35	<3.1	<0.58	<0.45	<0.62	<0.32	<0.62	<0.45	<17	<17
DG-AF5	1	0.5-1	DG-AF5S-0.5-1	1/8/2019	**4.2**	**4.4**	**9.2**	<0.53	**11**	<0.35	**110**	<0.57	<0.44	<0.61	<0.32	<0.61	**11**	<17	**600**
DG-AF5	1	3.5-4	DG-AF5S-3.5-4	1/8/2019	<0.58	<0.40	<0.39	<0.52	<0.38	<0.34	<2.7	<0.56	<0.44	<0.60	<0.31	<0.60	<0.44	<17	<17
DG-AG3	1	0.5-1	DG-AG3S-0.5-1	12/19/2018	<0.59	<0.41	<0.40	<0.53	<0.39	<0.35	<3.1	<0.57	<0.45	<0.61	<0.32	<0.61	<0.45	<17	<17
DG-AG3	1	3.5-4	DG-AG3S-3.5-4	12/19/2018	<0.61	<0.42	<0.41	<0.55	<0.40	<0.36	<3.2	<0.59	<0.46	<0.63	<0.33	<0.63	<0.46	<17	<17
DG-AG7	1	0.5-1	DG-AG7S-0.5-1	1/30/2019	**1.8 J**	**4.4 J**	**2.7 J**	<1.5	<2.0	<1.5	<10	<1.5	<1.5	<1.5	<2.0	<1.5	<1.5	**120 J**	**110 J**
DG-AG7	1	3.5-4	DG-AG7S-3.5-4	1/30/2019	<1.5	<1.5	<1.5	<1.5	<2.0	<1.5	<9.8	<1.5	<1.5	<1.5	<2.0	<1.5	<1.5	<17	<17
DG-AH5	1	0.5-1	DG-AH5S-0.5-1	1/8/2019	<0.58	<0.40	<0.39	<0.53	<0.38	<0.34	<2.8	<0.56	<0.44	<0.60	<0.32	<0.60	<0.44	<17	**17**
DG-AH5	1	8-8.5	DG-AH5S-8-8.5	1/8/2019	<0.58	<0.40	<0.39	<0.52	<0.38	<0.34	<2.7	<0.56	<0.43	<0.59	<0.31	<0.59	<0.43	<17	<17
DG-AH9	2	0.5-1	DG-AH9S-0.5-1	1/30/2019	<1.5	<1.5	**2.2 J**	<1.5	<2.0	<1.5	<9.8	**1.6 J**	<1.5	<1.5	<2.0	<1.5	<1.5	<17	**38 J**
DG-AH9	2	3.5-4	DG-AH9S-3.5-4	1/30/2019	<1.5	<1.5	<1.5	<1.5	<2.0	<1.5	<9.8	<1.5	<1.5	<1.5	<2.0	<1.5	<1.5	<17	<17
DG-AI3	2	0.5-1	DG-AI3S-0.5-1	12/19/2018	<0.59 U	<0.41	<0.40	<0.53	<0.39	<0.35	<2.8	<0.57	<0.45	<0.61	<0.32	<0.61	<0.45	<17	<17
DG-AI3	2	3.5-4	DG-AI3S-3.5-4	12/19/2018	<0.58	<0.40	<0.39	<0.53	<0.38	<0.34	<2.8	<0.56	<0.44	<0.60	<0.32	<0.60	<0.44	<17	<17
DG-AI3 (D)	2	3.5-4	DG-AI3 (D)S-3.5-4	12/19/2018	<0.58	<0.40	<0.39	<0.52	<0.38	<0.34	<3.0	<0.56	<0.44	<0.60	<0.31	<0.60	<0.44	<17	<17
DG-AI7	2	0.5-1	DG-AI7S-0.5-1	1/9/2019	**12**	**12**	**31**	<0.54	<0.39	<0.35	<3.1	**14**	**26**	<0.62	<0.32	<0.62	<0.45	<170	**1,500**
DG-AI7	2	3.5-4	DG-AI7S-3.5-4	1/9/2019	<0.60	<0.41	<0.40	<0.54	<0.39	<0.35	<3.1	<0.58	<0.45	<0.62	<0.32	<0.62	<0.45	<17	<17
DG-AI7	2	8-8.5	DG-AI7S-8-8.5	1/9/2019	<0.61	<0.42	<0.41	<0.55	<0.40	<0.36	<3.2	<0.59	<0.46	<0.63	<0.33	<0.63	<0.46	<17	<17
DG-AJ5	2	0.5-1	DG-AJ5S-0.5-1	1/8/2019	<0.60	**0.44**	<0.40	<0.54	<0.39	<0.35	<2.8	<0.58	<0.45	<0.62	<0.32	<0.62	<0.45	<17	**320**
DG-AJ5	2	3.5-4	DG-AJ5S-3.5-4	1/8/2019	<0.60	<0.41	<0.40	<0.54	<0.39	<0.35	<3.1	<0.58	<0.45	<0.62	<0.32	<0.62	<0.45	<17	<17
DG-AJ9	2	0.5-1	DG-AJ9S-0.5-1	1/30/2019	<1.5	**1.6 J**	**54**	<1.5	<2.0	<1.5	<9.9	**4.4 J**	<1.5	<1.5	<2.0	<1.5	<1.5	<17	**820**
DG-AJ9	2	3.5-4	DG-AJ9S-3.5-4	1/30/2019	<1.5	<1.5	<1.5	<1.5	<2.0	<1.5	<9.8	<1.5	<1.5	<1.5	<2.0	<1.5	<1.5	<17	<17
DG-AK3	2	0.5-1	DG-AK3S-0.5-1	12/19/2018	<0.60	**0.76 J**	**1.2 J**	<0.54	<0.39	<0.35	<3.1	<0.58	<0.45	<0.61	<0.32	<0.61	<0.45	<17	<17
DG-AK3	2	3.5-4	DG-AK3S-3.5-4	12/19/2018	<0.60	<0.42	<0.41	<0.54	<0.40	<0.36	<2.9	<0.58	<0.46	<0.62	<0.33	<0.62	<0.46	<17	<17
DG-AK7	2	0.5-1	DG-AK7S-0.5-1	1/9/2019	**19**	**18**	**32**	<0.55	<0.40	<0.36	<3.2	**22**	**30**	<0.63	<0.33	<0.63	<0.46	<84	**940**
DG-AK7	2	3.5-4	DG-AK7S-3.5-4	1/9/2019	<0.60	<0.41	<0.40	<0.54	<0.39	<0.36	<3.2	<0.58	<0.45	<0.62	<0.33	<0.62	<0.45	<17	<17
DG-AK7 (D)	2	3.5-4	DG-AK7 (D)S-3.5-4	1/9/2019	<0.61	<0.42	<0.41	<0.55	<0.40	<0.36	<3.2	<0.59	<0.46	<0.63	<0.33	<0.63	<0.46	<17	<17

Table 4: Organochlorine Pesticides and Polychlorinated Biphenyls Concentrations in Soil
Brisbane Baylands OU-2
Brisbane, California

Sample Location	Investigation Zone	Depth Range (ft bgs)	Sample Name	Collection Date	4,4'-DDD	4,4'-DDE	4,4'-DDT	alpha-BHC	alpha-Chlordane	beta-BHC	Chlordane	Dieldrin	Endrin	Endrin aldehyde	Endrin ketone	gamma-BHC (Lindane)	gamma-Chlordane	PCB-1254 (Aroclor 1254)	PCB-1260 (Aroclor 1260)
Direct Exposure Human Health Risk Level Residential Soil Exposure ESL [1]					2.7E+03	1.8E+03	1.9E+03	--	--	--	4.8E+02	3.7E+01	2.1E+04	--	--	5.50E+02	--	2.30E+02	
Leaching to Groundwater Levels Non-drinking Water ESL [2]					6.5E+04	2.9E+04	5.6E+03	--	--	--	2.3E+04	6.3E+00	7.6E+00	--	--	7.4E+00	--	3.3E+05	
USEPA RSL for Resident Soil [3]					1.9E+03	2.0E+03	1.9E+03	8.6E+01	1.7E+03	3.0E+02	1.7E+03	3.4E+01	1.9E+04	--	--	5.7E+02	1.7E+03	2.4E+02	2.4E+02
Units					µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg
DG-AL5	2	0.5-1	DG-AL5S-0.5-1	1/30/2019	<1.5	<1.5	<1.5	<1.5	<2.0	<1.5	<9.9	<1.5	<1.5	<1.5	<2.0	<1.5	<1.5	<17	**17 J**
DG-AL5	2	3.5-4	DG-AL5S-3.5-4	1/30/2019	<1.5	<1.5	<1.5	<1.5	<1.9	<1.5	<9.7	<1.5	<1.5	<1.5	<1.9	<1.5	<1.5	<17	<17
DG-AL5 (D)	2	3.5-4	DG-AL5 (D)S-3.5-4	1/30/2019	<1.5	<1.5	<1.5	<1.5	<2.0	<1.5	<9.9	<1.5	<1.5	<1.5	<2.0	<1.5	<1.5	<17	<17
DG-AL9	2	0.5-1	DG-AL9S-0.5-1	1/21/2019	**34 J**	**91 F2**	**26 J**	<0.54	<0.40	<0.36	<2.9	<0.58	<0.45	<0.62	<0.33	<0.62	<0.45	<17	<17
DG-AL9	2	3.5-4	DG-AL9S-3.5-4	1/21/2019	<0.60	<0.41	<0.40	<0.54	<0.39	<0.36	<2.9	<0.58	<0.45	<0.62	<0.33	<0.62	<0.45	<17	<17
DG-AL9	2	7-7.5	DG-AL9S-7-7.5	1/21/2019	<0.60	<0.41	<0.40	<0.54	<0.39	<0.36	<2.9	<0.58	<0.45	<0.62	<0.33	<0.62	<0.45	<17	<17
DG-AL9 (D)	2	7-7.5	DG-AL9 (D)S-7-7.5	1/21/2019	<0.60	<0.41	<0.40	<0.54	<0.39	<0.35	<3.1	<0.58	<0.45	<0.62	<0.32	<0.62	<0.45	<17	<17
DG-AM3	2	0.5-1	DG-AM3S-0.5-1	12/19/2018	<0.58	**3.1**	**12**	<0.52	<0.38	<0.34	<3.0	<0.56	<0.43	<0.59	<0.31	<0.59	<0.43	<17	**25 J**
DG-AM3	2	3.5-4	DG-AM3S-3.5-4	12/19/2018	<0.61	<0.42	<0.41	<0.55	<0.40	<0.36	<2.9	<0.59	<0.46	<0.63	<0.33	<0.63	<0.46	<17	<17
DG-AM7	2	0.5-1	DG-AM7S-0.5-1	1/9/2019	**7**	**6.1**	**23**	<0.54	**2.2**	<0.36	<3.2	**28**	<0.46	<0.62	<0.33	<0.62	**2.5**	<17	**430**
DG-AM7	2	3.5-4	DG-AM7S-3.5-4	1/9/2019	<0.61	<0.42	<0.41	<0.55	<0.40	<0.36	<3.2	<0.59	<0.46	<0.63	<0.33	<0.63	<0.46	<17	<17
DG-AM7	2	7.5-8	DG-AM7S-7.5-8	1/9/2019	<0.60	<0.41	<0.40	<0.54	<0.39	<0.35	<3.1	<0.58	<0.45	<0.62	<0.32	<0.62	<0.45	<17	<17
DG-AN5	2	0.5-1	DG-AN5S-0.5-1	12/20/2018	<0.61	**0.65 J**	<0.41	<0.55	<0.40	<0.36	<3.2	<0.59	<0.46	<0.63	<0.33	<0.63	<0.46	<17	**23 J**
DG-AN5	2	3.5-4	DG-AN5S-3.5-4	12/20/2018	<0.58	<0.40	<0.39	<0.53	<0.38	<0.34	<2.8	<0.56	<0.44	<0.60	<0.32	<0.60	<0.44	<17	<17
DG-AN9	2	0.5-1	DG-AN9S-0.5-1	1/21/2019	<0.60	**1.7 J**	<0.40	<0.54	<0.39	<0.35	<2.8	<0.58	<0.45	<0.62	<0.32	<0.62	<0.45	<17	<17
DG-AN9	2	3.5-4	DG-AN9S-3.5-4	1/21/2019	<0.59	<0.41	<0.40	<0.54	<0.39	<0.35	<3.1	<0.58	<0.45	<0.61	<0.32	<0.61	<0.45	<17	<17
DG-AN9	2	7-7.5	DG-AN9S-7-7.5	1/21/2019	<0.59	<0.41	<0.40	<0.53	<0.39	<0.35	<3.1	<0.57	<0.45	<0.61	<0.32	<0.61	<0.45	<17	<17
DG-AO3	2	0.5-1	DG-AO3S-0.5-1	12/19/2018	<0.58	<0.40	<0.39	<0.52	<0.38	<0.34	<3.0	<0.56	<0.43	<0.59	<0.31	<0.59	<0.43	<17	**24 J**
DG-AO3	2	3.5-4	DG-AO3S-3.5-4	12/19/2018	<0.61	<0.42	<0.41	<0.55	<0.40	<0.36	<3.2	<0.59	<0.46	<0.63	<0.33	<0.63	<0.46	<17	<17
DG-AO7	2	0.5-1	DG-AO7S-0.5-1	1/9/2019	**2.8**	**3.8**	**6.9**	<0.55	**2.1**	<0.36	**46**	<0.59	<0.46	<0.63	<0.33	<0.63	**2.4**	<17	**440**
DG-AO7	2	3.5-4	DG-AO7S-3.5-4	1/9/2019	<0.61	<0.42	<0.41	<0.55	<0.40	<0.36	<3.2	<0.59	<0.46	<0.63	<0.33	<0.63	<0.46	<17	<17
DG-AP5	2	0.5-1	DG-AP5S-0.5-1	12/20/2018	<0.59	<0.41	<0.40	<0.53	<0.39	<0.35	<3.1	<0.57	<0.45	<0.61	<0.32	<0.61	<0.45	<17	<17
DG-AP5	2	3.5-4	DG-AP5S-3.5-4	12/20/2018	<0.59	<0.41	<0.40	<0.53	<0.39	<0.35	<3.1	<0.57	<0.45	<0.61	<0.32	<0.61	<0.45	<17	<17
DG-AP9	2	0.5-1	DG-AP9S-0.5-1	1/21/2019	<0.60	<0.41	<0.40	<0.54	<0.39	<0.35	<3.2	<0.58	<0.45	<0.62	<0.33	<0.62	<0.45	<17	<17
DG-AP9	2	3.5-4	DG-AP9S-3.5-4	1/21/2019	<0.59	<0.41	<0.40	<0.54	<0.39	<0.35	<3.1	<0.58	<0.45	<0.61	<0.32	<0.61	<0.45	<17	<17
DG-AQ3	2	0.5-1	DG-AQ3S-0.5-1	12/19/2018	<0.60	<0.41	<0.40	<0.54	<0.39	<0.35	<3.1	<0.58	<0.45	<0.62	<0.32	<0.62	<0.45	<17	<17
DG-AQ3	2	3.5-4	DG-AQ3S-3.5-4	12/19/2018	<0.60	<0.41	<0.40	<0.54	<0.39	<0.35	<3.1	<0.58	<0.45	<0.62	<0.32	<0.62	<0.45	<17	<17
DG-AQ7	2	0.5-1	DG-AQ7S-0.5-1	1/30/2019	<1.5	<1.5	<1.5	<1.5	<1.9	<1.5	<9.7	<1.5	<1.5	<1.5	<1.9	<1.5	<1.5	<17	<17
DG-AQ7	2	3.5-4	DG-AQ7S-3.5-4	1/30/2019	<1.5	<1.5	<1.5	<1.5	<2.0	<1.5	<9.8	<1.5	<1.5	<1.5	<2.0	<1.5	<1.5	<17	<17
DG-AR5	2	0.5-1	DG-AR5S-0.5-1	12/20/2018	<0.60	<0.41	<0.40	<0.54	<0.39	<0.35	<3.1	<0.58	<0.45	<0.62	<0.32	<0.62	<0.45	<17	<17
DG-AR5	2	3.5-4	DG-AR5S-3.5-4	12/20/2018	<0.59	<0.40	<0.39	<0.53	<0.39	<0.35	<3.1	<0.57	<0.44	<0.61	<0.32	<0.61	<0.44	<17	<17
DG-AR9	2	0.5-1	DG-AR9S-0.5-1	1/9/2019	**4.3**	**3.4**	**15**	<0.54	**2.4**	<0.36	**35**	**3.9**	<0.46	<0.62	<0.33	<0.62	**3.1**	<17	**68**
DG-AR9	2	3.5-4	DG-AR9S-3.5-4	1/9/2019	<0.59	<0.41	<0.40	<0.53	<0.39	<0.35	<3.1	<0.57	<0.45	<0.61	<0.32	<0.61	<0.45	<17	<17
DG-AR9 (D)	2	3.5-4	DG-AR9 (D)S-3.5-4	1/9/2019	<0.60	<0.41	<0.40	<0.54	<0.39	<0.35	<3.2	<0.58	<0.45	<0.62	<0.33	<0.62	<0.45	<17	<17
DG-AS3	2	0.5-1	DG-AS3S-0.5-1	12/20/2018	<0.60	<0.41 UJ	<0.40 UJ	<0.54	<0.39	<0.35	<2.9	<0.58	<0.45	<0.62	<0.32	<0.62	<0.45	<17	<17
DG-AS3 (D)	2	0.5-1	DG-AS3 (D)S-0.5-1	12/20/2018	<0.58	**2.6 J**	**2.5 J**	<0.53	<0.38	<0.34	<3.1	<0.56	<0.44	<0.60	<0.32	<0.60	<0.44	<17	<17
DG-AS3	2	3.5-4	DG-AS3S-3.5-4	12/20/2018	<0.60	<0.42	<0.41	<0.54	<0.40	<0.36	<3.2	<0.58	<0.45	<0.62	<0.33	<0.62	<0.45	<17	<17
DG-AS3	2	4.5-5	DG-AS3S-4.5-5	12/20/2018	<0.59	<0.40	<0.39	<0.53	<0.39	<0.35	<3.1	<0.57	<0.44	<0.61	<0.32	<0.61	<0.44	<17	<17

Table 4: Organochlorine Pesticides and Polychlorinated Biphenyls Concentrations in Soil
Brisbane Baylands OU-2
Brisbane, California

Sample Location	Investigation Zone	Depth Range (ft bgs)	Sample Name	Collection Date	4,4'-DDD	4,4'-DDE	4,4'-DDT	alpha-BHC	alpha-Chlordane	beta-BHC	Chlordane	Dieldrin	Endrin	Endrin aldehyde	Endrin ketone	gamma-BHC (Lindane)	gamma-Chlordane	PCB-1254 (Aroclor 1254)	PCB-1260 (Aroclor 1260)
Direct Exposure Human Health Risk Level Residential Soil Exposure ESL [1]					2.7E+03	1.8E+03	1.9E+03	--	--	--	4.8E+02	3.7E+01	2.1E+04	--	--	5.50E+02	--	2.30E+02	
Leaching to Groundwater Levels Non-drinking Water ESL [2]					6.5E+04	2.9E+04	5.6E+03	--	--	--	2.3E+04	6.3E+00	7.6E+00	--	--	7.4E+00	--	3.3E+05	
USEPA RSL for Resident Soil [3]					1.9E+03	2.0E+03	1.9E+03	8.6E+01	1.7E+03	3.0E+02	1.7E+03	3.4E+01	1.9E+04	--	--	5.7E+02	1.7E+03	2.4E+02	2.4E+02
Units					µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg
DG-AS7	2	0.5-1	DG-AS7S-0.5-1	1/9/2019	**2.9**	**2.3**	**16**	<0.54	<0.39	<0.35	<3.1	<0.58	<0.45	<0.62	<0.32	<0.62	<0.45	<17	**120**
DG-AS7	2	3.5-4	DG-AS7S-3.5-4	1/9/2019	<0.61	<0.42	<0.41	<0.55	<0.40	<0.36	<3.2	<0.59	<0.46	<0.63	<0.33	<0.63	<0.46	<17	<17
DG-AT5	2	0.5-1	DG-AT5S-0.5-1	12/20/2018	<0.58	<0.40	<0.39	<0.52	<0.38	<0.34	<2.8	<0.56	<0.44	<0.60	<0.31	<0.60	<0.44	<17	<17
DG-AT5	2	3.5-4	DG-AT5S-3.5-4	12/20/2018	<0.60	<0.41	<0.40	<0.54	<0.39	<0.35	<2.8	<0.58	<0.45	<0.62	<0.32	<0.62	<0.45	<17	<17
DG-AU3	2	0.5-1	DG-AU3S-0.5-1	12/20/2018	**2.6**	**0.79 J**	<0.40	<0.54	<0.39	<0.35	<3.2	<0.58	<0.45	<0.62	<0.33	<0.62	<0.45	<17	**36 J**
DG-AU3	2	3.5-4	DG-AU3S-3.5-4	12/20/2018	<0.59	<0.41	<0.40	<0.54	<0.39	<0.35	<3.1	<0.57	<0.45	<0.61	<0.32	<0.61	<0.45	<17	<17
DG-AU7	2	0.5-1	DG-AU7S-0.5-1	1/9/2019	**3.9**	**2.3**	**13**	<0.54	**0.84**	<0.36	<3.2	<0.58	<0.46	<0.62	<0.33	<0.62	**1**	<17	**220**
DG-AU7 (D)	2	0.5-1	DG-AU7 (D)S-0.5-1	1/9/2019	**3.6**	**2.8**	<0.40	<0.54	**1.2**	<0.35	<3.1	<0.58	<0.45	<0.62	<0.32	<0.62	**1**	<17	<17
DG-AU7	2	3.5-4	DG-AU7S-3.5-4	1/9/2019	<0.60	<0.41	<0.40	<0.54	<0.39	**2.5**	<3.2	<0.58	<0.45	<0.62	<0.33	<0.62	<0.45	<17	<17
DG-AV5	2	0.5-1	DG-AV5S-0.5-1	12/20/2018	<0.60	**5.7 J**	**14 J**	<0.54	<0.39 UJ	<0.36	<2.9 UJ	<0.58	<0.45	<0.62	<0.33	<0.62	<0.45 UJ	<17	**420 J**
DG-AV5 (D)	2	0.5-1	DG-AV5 (D)S-0.5-1	12/20/2018	<0.58	**7.8**	**21 J**	<0.53	**12 J**	<0.34	**160 J**	<0.56	<0.44	<0.60	<0.32	<0.60	**12 J**	<17	**740 J**
DG-AV5	2	3.5-4	DG-AV5S-3.5-4	12/20/2018	<0.59 U	<0.41	<0.40	<0.54	<0.39	<0.35	<3.1	<0.57	<0.45	<0.61	<0.32	<0.61	<0.45	<17	<17
DG-AV5	2	7.5-8	DG-AV5S-7.5-8	12/20/2018	<0.59	<0.40	<0.39	<0.53	<0.38	<0.35	<3.1	<0.57	<0.44	<0.61	<0.32	<0.61	<0.44	<17	<17
DG-AW3	2	0.5-1	DG-AW3S-0.5-1	1/31/2019	<1.5	<1.5	**1.5 J**	<1.5	<2.0	<1.5	<9.8	<1.5	<1.5	<1.5	<2.0	<1.5	<1.5	<17	**25 J**
DG-AW3	2	3.5-4	DG-AW3S-3.5-4	1/31/2019	<1.5	<1.5	<1.5	<1.5	<2.0	<1.5	<9.9	<1.5	<1.5	<1.5	<2.0	<1.5	<1.5	<17	<17
DG-AX5	2	0.5-1	DG-AX5S-0.5-1	12/20/2018	<0.61	<0.42	<0.41	<0.55	<0.40	<0.36	<2.9	<0.59	<0.46	<0.63	<0.33	<0.63	<0.46	<17	<17
DG-AX5	2	3.5-4	DG-AX5S-3.5-4	12/20/2018	<0.57	<0.40	<0.39	<0.52	<0.38	<0.34	<3.0	<0.56	<0.43	<0.59	<0.31	<0.59	<0.43	<17	<17
DG-AY3	2	0.5-1	DG-AY3S-0.5-1	1/31/2019	<1.5	<1.5	<1.5	<1.5	<2.0	<1.5	<9.9	<1.5	<1.5	<1.5	<2.0	<1.5	<1.5	<17	<17
DG-AY3	2	3.5-4	DG-AY3S-3.5-4	1/31/2019	<1.5	<1.5	<1.5	<1.5	<2.0	<1.5	<9.8	<1.5	<1.5	<1.5	<2.0	<1.5	<1.5	<17	<17
DG-N9	3	0.5-1	DG-N9S-0.5-1	1/10/2019	<1.2	<0.80	<0.78	<1.0	<0.76	<0.68	<6.1	<1.1	<0.87	<1.2	<0.63	<1.2	<0.87	<17	<17
DG-N9	3	3.5-4	DG-N9S-3.5-4	1/10/2019	<0.58	<0.40	<0.39	<0.53	<0.38	<0.34	<3.1	<0.56	<0.44	<0.60	<0.32	<0.60	<0.44	<17	<17
DG-N13	3	0.5-1	DG-N13S-0.5-1	1/10/2019	<0.61	<0.42	**1.4 J**	<0.55	**0.68 J**	<0.36	<3.2	<0.59	<0.46	<0.63	<0.33	<0.63	<0.46	<17	<17
DG-N13 (D)	3	0.5-1	DG-N13 (D)S-0.5-1	1/10/2019	<0.58	<0.40	**0.44 J**	<0.52	<0.38 UJ	<0.34	<3.0	<0.56	<0.43	<0.59	<0.31	<0.59	<0.43	<17	<17
DG-N13	3	3.5-4	DG-N13S-3.5-4	1/10/2019	**1.6 J**	<0.41	<0.40	<0.53	<0.39	<0.35	<3.1	<0.57	<0.45	<0.61	<0.32	<0.61	<0.45	<17	<17
DG-N13	3	7.5-8	DG-N13S-7.5-8	1/10/2019	<0.61	<0.42	<0.41	<0.55	<0.40	<0.36	<3.2	<0.59	<0.46	<0.63	<0.33	<0.63	<0.46	<17	<17
DG-O7	3	0.5-1	DG-O7S-0.5-1	1/8/2019	<0.58	<0.40	**1.4**	<0.52	<0.38	<0.34	<3.0	<0.56	<0.44	<0.60	<0.31	<0.60	<0.44	<17	<17
DG-O7	3	3.5-4	DG-O7S-3.5-4	1/8/2019	<0.59	<0.41	<0.40	<0.53	<0.39	<0.35	<3.1	<0.57	<0.44	<0.61	<0.32	<0.61	<0.44	<17	<17
DG-O11	3	0.5-1	DG-O11S-0.5-1	1/10/2019	<0.61	<0.42	<0.41	<0.55	<0.40	<0.36	<3.2	<0.59	<0.46	<0.63	<0.33	<0.63	<0.46	<17	<17
DG-O11	3	3.5-4	DG-O11S-3.5-4	1/10/2019	<0.60	**0.58 J**	<0.40	<0.54	<0.39	<0.35	<3.2	<0.58	<0.45	<0.62	<0.33	<0.62	<0.45	<17	<17
DG-O15	3	0.5-1	DG-O15S-0.5-1	1/10/2019	**0.62 J**	<0.40	<0.39	<0.52	<0.38 R	<0.34	<3.0	<0.56	<0.44	<0.60	<0.31	<0.60	<0.44	<17	<17
DG-O15	3	3.5-4	DG-O15S-3.5-4	1/10/2019	<0.59	<0.40	<0.39	<0.53	<0.39	<0.35	<3.1	<0.57	<0.44	<0.61	<0.32	<0.61	<0.44	<17	<17
DG-O15 (D)	3	3.5-4	DG-O15 (D)S-3.5-4	1/10/2019	<0.61	<0.42	<0.41	<0.55	<0.40	<0.36	<3.2	<0.59	<0.46	<0.63	<0.33	<0.63	<0.46	<17	<17
DG-O15	3	7.5-8	DG-O15S-7.5-8	1/10/2019	<0.61	<0.42	<0.41	<0.55	<0.40	<0.36	<3.2	<0.59	<0.46	<0.63	<0.33	<0.63	<0.46	<17	<17
DG-P9	3	0.5-1	DG-P9S-0.5-1	11/21/2018	<0.59	<0.41	<0.40	<0.53	<0.39	<0.35	<3.1	<0.57	<0.45	<0.61	<0.32	<0.61	<0.45	<17	<17
DG-P9	3	3.5-4	DG-P9S-3.5-4	11/21/2018	<0.61	<0.42	<0.41	<0.55	<0.40	<0.36	<3.2	<0.59	<0.46	<0.63	<0.33	<0.63	<0.46	<17	<17
DG-P13	3	0.5-1	DG-P13S-0.5-1	1/10/2019	<0.60	<0.41	**9.6**	<0.54	<0.39	<0.35	<3.1	<0.58	<0.45	<0.62	<0.32	<0.62	<0.45	<17	<17
DG-P13	3	3.5-4	DG-P13S-3.5-4	1/10/2019	<0.61	<0.42	<0.41	<0.55	<0.40	<0.36	<3.2	<0.59	<0.46	<0.63	<0.33	<0.63	<0.46	<17	<17
DG-P13 (D)	3	3.5-4	DG-P13 (D)S-3.5-4	1/10/2019	<0.58	<0.40	<0.39	<0.52	<0.38	<0.34	<3.0	<0.56	<0.43	<0.59	<0.31	<0.59	<0.43	<17	<17

Table 4: Organochlorine Pesticides and Polychlorinated Biphenyls Concentrations in Soil
Brisbane Baylands OU-2
Brisbane, California

Sample Location	Investigation Zone	Depth Range (ft bgs)	Sample Name	Collection Date	4,4'-DDD	4,4'-DDE	4,4'-DDT	alpha-BHC	alpha-Chlordane	beta-BHC	Chlordane	Dieldrin	Endrin	Endrin aldehyde	Endrin ketone	gamma-BHC (Lindane)	gamma-Chlordane	PCB-1254 (Aroclor 1254)	PCB-1260 (Aroclor 1260)
Direct Exposure Human Health Risk Level Residential Soil Exposure ESL [1]					2.7E+03	1.8E+03	1.9E+03	--	--	--	4.8E+02	3.7E+01	2.1E+04	--	--	5.50E+02	--	2.30E+02	
Leaching to Groundwater Levels Non-drinking Water ESL [2]					6.5E+04	2.9E+04	5.6E+03	--	--	--	2.3E+04	6.3E+00	7.6E+00	--	--	7.4E+00	--	3.3E+05	
USEPA RSL for Resident Soil [3]					1.9E+03	2.0E+03	1.9E+03	8.6E+01	1.7E+03	3.0E+02	1.7E+03	3.4E+01	1.9E+04	--	--	5.7E+02	1.7E+03	2.4E+02	2.4E+02
Units					µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg
DG-Q11	3	0.5-1	DG-Q11S-0.5-1	1/10/2019	<1.2	<0.81	<0.79	<1.1	<0.77	<0.70	<6.2	<1.1	<0.89	<1.2	<0.64	<1.2	<0.89	<17	<17
DG-Q11 (D)	3	0.5-1	DG-Q11 (D)S-0.5-1	1/10/2019	<1.2	<0.83	<0.81	<1.1	<0.79	<0.71	<6.3	<1.2	<0.91	<1.2	<0.65	<1.2	<0.91	<17	<17
DG-Q11	3	3.5-4	DG-Q11S-3.5-4	1/10/2019	<2.9	<2.0	<1.9	<2.6	<1.9	<1.7	<15	<2.8	<2.2	<3.0	<1.6	<3.0	<2.2	<17	<17
DG-Q15	3	0.5-1	DG-Q15S-0.5-1	1/11/2019	<1.2	<0.83	<0.81 UJ	<1.1	<0.79	<0.72	<5.8	<1.2	<0.91	<1.3	<0.66	<1.3	<0.91	<17	<17 UJ
DG-Q15 (D)	3	0.5-1	DG-Q15 (D)S-0.5-1	1/11/2019	<1.2	<0.81	**6.0 J**	<1.1	<0.77	<0.69	<5.6	<1.1	<0.88	<1.2	<0.63	<1.2	<0.88	<17	<17 UJ
DG-Q15	3	3.5-4	DG-Q15S-3.5-4	1/11/2019	<0.59	<0.40	<0.39	<0.53	<0.39	<0.35	<2.8	<0.57	<0.44	<0.61	<0.32	<0.61	<0.44	<16	<16
DG-Q15	3	7.5-8	DG-Q15S-7.5-8	1/11/2019	<2.9	<2.0	<2.0	<2.6	<1.9	<1.7	<15	<2.8	<2.2	<3.0	<1.6	<3.0	<2.2	<17	<17
DG-R9	3	0.5-1	DG-R9S-0.5-1	1/22/2019	<0.58	<0.40	<0.39	<0.52	<0.38	<0.34	<2.8	<0.56	<0.44	<0.60	<0.31	<0.60	<0.44	<17	<17
DG-R9	3	3.5-4	DG-R9S-3.5-4	1/22/2019	<0.59	<0.41	<0.40	<0.53	<0.39	<0.35	<3.1	<0.57	<0.45	<0.61	<0.32	<0.61	<0.45	<17	<17
DG-R13	3	0.5-1	DG-R13S-0.5-1	1/28/2019	<0.60	<0.41	<0.40	<0.54	<0.39	<0.35	<3.2	<0.58	<0.45	<0.62	<0.33	<0.62	<0.45	<17	<17
DG-R13	3	3.5-4	DG-R13S-3.5-4	1/28/2019	<0.60	<0.41	<0.40	<0.54	<0.39	<0.36	<3.2	<0.58	<0.45	<0.62	<0.33	<0.62	<0.45	<17	<17
DG-S11	3	0.5-1	DG-S11S-0.5-1	1/10/2019	<2.9	<2.0	<1.9	<2.6	<1.9	<1.7	<15	<2.8	<2.2	<3.0	<1.6	<3.0	<2.2	<17	<17
DG-S11	3	3.5-4	DG-S11S-3.5-4	1/10/2019	<1.2	<0.84	<0.82	<1.1	<0.80	<0.72	<6.4	<1.2	<0.92	<1.3	<0.66	<1.3	<0.92	<17	<17
DG-S15	3	0.5-1	DG-S15S-0.5-1	1/11/2019	<1.2	<0.84	<0.82	<1.1	<0.80	<0.72	<6.4	<1.2	<0.92	<1.3	<0.66	<1.3	<0.92	<17	<17
DG-S15	3	3.5-4	DG-S15S-3.5-4	1/11/2019	<0.58	<0.40	<0.39	<0.52	<0.38	<0.34	<2.8	<0.56	<0.44	<0.60	<0.31	<0.60	<0.44	<17	<17
DG-S15	3	0.5-1	DG-S15S-0.5-1	1/11/2019	<1.2	<0.84	<0.82	<1.1	<0.80	<0.72	<6.4	<1.2	<0.92	<1.3	<0.66	<1.3	<0.92	<17	<17
DG-S15	3	3.5-4	DG-S15S-3.5-4	1/11/2019	<0.58	<0.40	<0.39	<0.52	<0.38	<0.34	<2.8	<0.56	<0.44	<0.60	<0.31	<0.60	<0.44	<17	<17
DG-S15 (D)	3	3.5-4	DG-S15 (D)S-3.5-4	1/11/2019	<0.59	<0.41	<0.40	<0.53	<0.39	<0.35	<2.8	<0.57	<0.45	<0.61	<0.32	<0.61	<0.45	<17	<17
DG-T9	3	0.5-1	DG-T9S-0.5-1	1/10/2019	**4.1 J**	**1.3 J**	**7.9**	<0.53	<0.38	<0.35	<3.1	<0.57	<0.44	<0.61	<0.32	<0.61	<0.44	<17	**17 J**
DG-T9	3	3.5-4	DG-T9S-3.5-4	1/10/2019	<0.59	<0.41	<0.40	<0.53	<0.39	<0.35	<3.1	<0.57	<0.45	<0.61	<0.32	<0.61	<0.45	<17	<17
DG-T13	3	0.5-1	DG-T13S-0.5-1	1/10/2019	<0.58	<0.40	<0.39	<0.52	<0.38	<0.34	<3.0	<0.56	<0.44	<0.60	<0.31	<0.60	<0.44	<17	<17
DG-T13 (D)	3	0.5-1	DG-T13 (D)S-0.5-1	1/10/2019	<1.2	<0.81	<0.79	<1.1	<0.78	<0.70	<6.2	<1.1	<0.89	<1.2	<0.64	<1.2	<0.89	<17	<17
DG-T13	3	3.5-4	DG-T13S-3.5-4	1/10/2019	<0.61	<0.42	<0.41	<0.55	<0.40	<0.36	<3.2	<0.59	<0.46	<0.63	<0.33	<0.63	<0.46	<17	<17
DG-T17	3	0.5-1	DG-T17S-0.5-1	1/28/2019	<1.2	**2.6 J**	<0.81	<1.1	<0.79	<0.71	<6.3	<1.2	<0.90	<1.2	<0.65	<1.2	<0.90	<17	**33 J**
DG-T17	3	3.5-4	DG-T17S-3.5-4	1/28/2019	<0.59	<0.40	<0.39	<0.53	<0.38	<0.35	<3.1	**0.94 J**	<0.44	<0.60	<0.32	<0.60	<0.44 U	<17	<17
DG-T17	3	7-7.5	DG-T17S-7-7.5	1/28/2019	<0.60	<0.41	<0.40	<0.54	<0.39	<0.36	<3.2	<0.58	<0.45	<0.62	<0.33	<0.62	<0.45	<17	<17
DG-T17 (D)	3	7-7.5	DG-T17 (D)S-7-7.5	1/28/2019	<6.0	<4.1	<4.0	<5.4	<3.9	<3.6	<32	<5.8	<4.5	<6.2	<3.3	<6.2	<4.5	<17	<17
DG-U11	3	0.5-1	DG-U11S-0.5-1	1/10/2019	<3.0	<2.1	<2.0	<2.7	<2.0	<1.8	<16	<2.9	<2.3	<3.1	<1.6	<3.1	<2.3	<17	<17
DG-U11	3	3.5-4	DG-U11S-3.5-4	1/10/2019	<0.61	<0.42	<0.41	<0.55	<0.40	<0.36	<3.2	<0.59	<0.46	<0.63	<0.33	<0.63	<0.46	<17	<17
DG-U15	3	3.5-4	DG-U15S-3.5-4	1/28/2019	<0.61	<0.42	<0.41	<0.55	<0.40	<0.36	<3.2	<0.59	<0.46	<0.63	<0.33	<0.63	<0.46	<17	<17
DG-U15	3	8.5-9	DG-U15S-8.5-9	1/28/2019	<6.0	<4.1	<4.0	<5.4	<3.9	<3.5	<31	<5.8	<4.5	<6.2	<3.2	<6.2	<4.5	<17	<17
DG-U17	3	0.5-1	DG-U17S-0.5-1	1/28/2019	<1.2	<0.83	<0.81	<1.1	<0.79	<0.71	<6.3	<1.2	<0.90	<1.2	<0.65	<1.2	<0.90	<17	**78**
DG-V13	3	0.5-1	DG-V13S-0.5-1	1/10/2019	<1.2	<0.81	<0.79	<1.1	<0.77	<0.69	<6.1	<1.1	<0.88	<1.2	<0.63	<1.2	<0.88	<17	<17
DG-V13	3	3.5-4	DG-V13S-3.5-4	1/10/2019	<0.59	<0.41	<0.40	<0.53	<0.39	<0.35	<3.1	<0.57	<0.44	<0.61	<0.32	<0.61	<0.44	<17	**21 J**
DG-V13	3	7.5-8	DG-V13S-7.5-8	1/10/2019	<0.58	<0.40	<0.39	<0.52	<0.38	<0.34	<3.0	<0.56	<0.43	<0.60	<0.31	<0.60	<0.43	<17	<17
DG-V17	3	0.5-1	DG-V17S-0.5-1	1/28/2019	<0.60	<0.42	<0.41	<0.55	<0.40	<0.36	<3.2	<0.58	<0.46	<0.62	<0.33	<0.62	<0.46	<17	<17
DG-V17	3	3.5-4	DG-V17S-3.5-4	1/28/2019	<0.61	<0.42	<0.41	<0.55	<0.40	<0.36	<3.2	<0.59	<0.46	<0.63	<0.33	<0.63	<0.46	<17	<17
DG-V17 (D)	3	3.5-4	DG-V17 (D)S-3.5-4	1/28/2019	<0.58	<0.40	<0.39	<0.52	<0.38	<0.34	<3.0	<0.56	<0.44	<0.60	<0.31	<0.60	<0.44	<17	<17
DG-V17	3	9.5-10	DG-V17S-9.5-10	1/28/2019	<6.0	<4.1	<4.0	<5.4	<3.9	<3.5	<31	<5.8	<4.5	<6.2	<3.2	<6.2	<4.5	<17	<17
DG-W11	4	0.5-1	DG-W11S-0.5-1	1/29/2019	<1.2	<0.82	<0.80	<1.1	<0.78	<0.70	<6.2	<1.2	<0.90	<1.2	<0.64	<1.2	<0.90	<17	<17

Table 4: Organochlorine Pesticides and Polychlorinated Biphenyls Concentrations in Soil
Brisbane Baylands OU-2
Brisbane, California

Sample Location	Investigation Zone	Depth Range (ft bgs)	Sample Name	Collection Date	4,4'-DDD	4,4'-DDE	4,4'-DDT	alpha-BHC	alpha-Chlordane	beta-BHC	Chlordane	Dieldrin	Endrin	Endrin aldehyde	Endrin ketone	gamma-BHC (Lindane)	gamma-Chlordane	PCB-1254 (Aroclor 1254)	PCB-1260 (Aroclor 1260)
Direct Exposure Human Health Risk Level Residential Soil Exposure ESL [1]					2.7E+03	1.8E+03	1.9E+03	--	--	--	4.8E+02	3.7E+01	2.1E+04	--	--	5.50E+02	--	2.30E+02	
Leaching to Groundwater Levels Non-drinking Water ESL [2]					6.5E+04	2.9E+04	5.6E+03	--	--	--	2.3E+04	6.3E+00	7.6E+00	--	--	7.4E+00	--	3.3E+05	
USEPA RSL for Resident Soil [3]					1.9E+03	2.0E+03	1.9E+03	8.6E+01	1.7E+03	3.0E+02	1.7E+03	3.4E+01	1.9E+04	--	--	5.7E+02	1.7E+03	2.4E+02	2.4E+02
Units					µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg
DG-W11	4	3.5-4	DG-W11S-3.5-4	1/29/2019	<0.60	<0.41	<0.40	<0.54	<0.39	<0.35	<3.1	<0.58	<0.45	<0.62	<0.32	<0.62	<0.45	<17	<17
DG-W11 (D)	4	3.5-4	DG-W11 (D)S-3.5-4	1/29/2019	<0.60	<0.41	<0.40	<0.54	<0.39	<0.36	<3.2	<0.58	<0.45	<0.62	<0.33	<0.62 U	<0.45	<17	<17
DG-W15	4	0.5-1	DG-W15S-0.5-1	1/28/2019	<6.0	<4.1	<4.0	<5.4	<3.9	<3.5	<31	<5.8	<4.5	<6.2	<3.2	<6.2	<4.5	<17 UJ	<17 UJ
DG-W15 (D)	4	0.5-1	DG-W15 (D)S-0.5-1	1/28/2019	<6.0	<4.1	<4.0	<5.4	<3.9	<3.5	<31	<5.8	<4.5	<6.2	<3.2	<6.2	<4.5	<17	<17
DG-W15	4	3.5-4	DG-W15S-3.5-4	1/28/2019	<1.2	<0.83	<0.81 U	<1.1	<0.79	<0.71	<6.3	<1.2	<0.91 U	<1.2	<0.65	<1.2	<0.91 U	<17	<17
DG-X13	4	0.5-1	DG-X13S-0.5-1	1/22/2019	<0.60 F1	<0.41	<0.40	<0.54	<0.39	<0.35	<3.1	<0.58	<0.45	<0.62	<0.32	<0.62	<0.45	<17	**22 J**
DG-X13	4	3.5-4	DG-X13S-3.5-4	1/22/2019	<0.58	<0.40	<0.39	<0.53	<0.38	<0.35	<2.8	<0.57	<0.44	<0.60	<0.32	<0.60	<0.44	<17	<17
DG-X13 (D)	4	3.5-4	DG-X13 (D)S-3.5-4	1/22/2019	<0.61	<0.42	<0.41	<0.55	<0.40	<0.36	<2.9	<0.59	<0.46	<0.63	<0.33	<0.63	<0.46	<17	<17
DG-X17	4	0.5-1	DG-X17S-0.5-1	1/28/2019	<6.0	<4.1	<4.0	<5.4	<3.9	<3.5	<31	<5.8	<4.5	<6.2	<3.2	<6.2	<4.5	<17	<17
DG-X17	4	3.5-4	DG-X17S-3.5-4	1/28/2019	<1.2	<0.83	<0.81	<1.1	<0.79	<0.71	<6.3	<1.2	<0.91	<1.3	<0.65	<1.3	<0.91	<17	<17
DG-Y11	4	0.5-1	DG-Y11S-0.5-1	1/21/2019	<6.0	<4.1	<4.0	<5.4	<3.9	<3.5	<31	<5.8	<4.5	<6.2	<3.2	<6.2	<4.5	<17	<17
DG-Y11	4	3.5-4	DG-Y11S-3.5-4	1/21/2019	<0.60	<0.41	<0.40	<0.54	<0.39	<0.35	<2.8	<0.58	<0.45	<0.62	<0.32	<0.62	<0.45	<17	<17
DG-Y15	4	0.5-1	DG-Y15S-0.5-1	1/31/2019	<1.5	<1.5	<1.5	<1.5	<2.0	<1.5	<9.8	**2.4 J**	<1.5	<1.5	<2.0	<1.5	<1.5	<17	<17
DG-Y15	4	3.5-4	DG-Y15S-3.5-4	1/31/2019	<1.5	<1.5	<1.5	<1.5	<2.0	<1.5	<9.8	<1.5	<1.5	<1.5	<2.0	<1.5	<1.5	<17	<17
DG-Y15 (D)	4	3.5-4	DG-Y15 (D)S-3.5-4	1/31/2019	<1.5	<1.5	<1.5	<1.5	<2.0	<1.5	<9.9	<1.5	<1.5	<1.5	<2.0	<1.5	<1.5	<17	<17
DG-Y15	4	7.5-8	DG-Y15S-7.5-8	1/31/2019	<1.5	<1.5	<1.5	<1.5	<2.0	<1.5	<9.8	<1.5	<1.5	<1.5	<2.0	<1.5	<1.5	<17	<17
DG-Y19	4	0.5-1	DG-Y19S-0.5-1	1/28/2019	<6.0	<4.1	<4.0	<5.4	<3.9	<3.5	<31	<5.8	<4.5	<6.2	<3.2	<6.2	<4.5	<17	<17
DG-Y19	4	3.5-4	DG-Y19S-3.5-4	1/28/2019	<0.60	<0.41	<0.40	<0.54	<0.39	<0.35	<3.1	<0.58	<0.45	<0.62	<0.32	<0.62	<0.45	<17	<17
DG-Y19	4	7.5-8	DG-Y19S-7.5-8	1/28/2019	<0.60	<0.41	<0.40	<0.54	<0.39	<0.35	<3.1	<0.58	<0.45	<0.62	<0.32	<0.62	<0.45	<17	<17
DG-Z13	4	0.5-1	DG-Z13S-0.5-1	1/28/2019	<0.60	**4.5**	<0.40	<0.54	<0.39	<0.35	<3.1	<0.58	<0.45	<0.62	<0.32	<0.62	<0.45	<17	<17
DG-Z13	4	3.5-4	DG-Z13S-3.5-4	1/28/2019	<0.60	**0.69 J**	<0.41	<0.54	<0.40	<0.36	<3.2	<0.58	<0.46	<0.62	<0.33	<0.62	<0.46	<17	<17
DG-Z17	4	0.5-1	DG-Z17S-0.5-1	1/28/2019	<1.2	<0.80 UJ	<0.78 UJ	<1.0	<0.76	<0.68	<6.1	<1.1	<0.87	<1.2	<0.63 UJ	<1.2	<0.87	<17	<17
DG-Z17 (D)	4	0.5-1	DG-Z17 (D)S-0.5-1	1/28/2019	<1.2	**3.3 J**	**0.88 J**	<1.0	<0.76	<0.68	<6.0	<1.1	<0.87	<1.2	**0.70 J**	<1.2	<0.87	<17	<17
DG-Z17	4	3.5-4	DG-Z17S-3.5-4	1/28/2019	<3.0	<2.0	<2.0	<2.7	<2.0	<1.8	<16	<2.9	<2.2	<3.1	<1.6	<3.1	<2.2	<17	<17
DG-Z17	4	7.5-8	DG-Z17S-7.5-8	1/28/2019	<0.60	<0.42	<0.41	<0.55	<0.40	<0.36	<3.2	<0.58	<0.46	<0.62	<0.33	<0.62	<0.46	<17	<17
DG-AA11	4	0.5-1	DG-AA11S-0.5-1	1/29/2019	<0.61	<0.42	<0.41	<0.55	<0.40	<0.36	<3.2	<0.59	<0.46	<0.63	<0.33	<0.63	<0.46	<17	<17
DG-AA11	4	3.5-4	DG-AA11S-3.5-4	1/29/2019	<0.60	<0.41	<0.40	<0.54	<0.39	<0.35	<3.2	<0.58	<0.45	<0.62	<0.33	<0.62	<0.45	<17	<17
DG-AA15	4	0.5-1	DG-AA15S-0.5-1	1/22/2019	<1.1	<0.79	<0.77	<1.0	<0.75	<0.68	<5.5	<1.1	<0.87	<1.2	<0.62	<1.2	<0.87	<17	<17
DG-AA19	4	0.5-1	DG-AA19S-0.5-1	1/24/2019	<1.5	<1.5	<1.5	<1.5	<2.0	<1.5	<9.9	<1.5	<1.5	<1.5	<2.0	<1.5	<1.5	<17	<17
DG-AA19	4	3.5-4	DG-AA19S-3.5-4	1/24/2019	<1.5	<1.5	<1.5	<1.5	<2.0	<1.5	<9.9	<1.5	<1.5	<1.5	<2.0	<1.5	<1.5	<17	<17
DG-AA19	4	8.5-9	DG-AA19S-8.5-9	1/24/2019	<1.5	<1.5	<1.5	<1.5	<2.0	<1.5	<9.8	<1.5	<1.5	<1.5	<2.0	<1.5	<1.5	<17	<17
DG-AB13	4	0.5-1	DG-AB13S-0.5-1	1/22/2019	<0.59	<0.41	<0.40	<0.53	<0.39	<0.35	<2.8	<0.57	<0.44	<0.61	<0.32	<0.61	<0.44	<17	<17
DG-AB13	4	3.5-4	DG-AB13S-3.5-4	1/22/2019	<0.59	<0.40	<0.39	<0.53	<0.38	<0.35	<3.1	<0.57	<0.44	<0.61	<0.32	<0.61	<0.44	<17	<17
DG-AB13 (D)	4	3.5-4	DG-AB13 (D)S-3.5-4	1/22/2019	<0.60	<0.41	<0.40	<0.54	<0.39	<0.35	<3.1	<0.58	<0.45	<0.62	<0.32	<0.62	<0.45	<17	<17
DG-AB13	4	13.5-14	DG-AB13S-13.5-14	1/22/2019	<12	<8.0	<7.8	<10	<7.6	<6.9	<61	<11	<8.8	<12	<6.3	<12	<8.8	<150	<150
DG-AC11	4	0.5-1	DG-AC11S-0.5-1	1/29/2019	**4.2 J**	**1.8 J**	<0.40	<0.54	<0.39	<0.35	<3.1	<0.58	<0.45	<0.62	<0.32	<0.62	<0.45	<17	<17
DG-AC11	4	3.5-4	DG-AC11S-3.5-4	1/29/2019	<6.0	<4.1	<4.0	<5.4	<3.9	<3.5	<31	<5.8	<4.5	<6.2	<3.2	<6.2	<4.5	<17 UJ	<17 UJ
DG-AC11	4	8.5-9	DG-AC11S-8.5-9	1/29/2019	<0.59	<0.41	<0.40	<0.54	<0.39	<0.35	<3.1	<0.57	<0.45	<0.61	<0.32	<0.61	<0.45	<17	<17

Table 4: Organochlorine Pesticides and Polychlorinated Biphenyls Concentrations in Soil
Brisbane Baylands OU-2
Brisbane, California

Sample Location	Investigation Zone	Depth Range (ft bgs)	Sample Name	Collection Date	4,4'-DDD	4,4'-DDE	4,4'-DDT	alpha-BHC	alpha-Chlordane	beta-BHC	Chlordane	Dieldrin	Endrin	Endrin aldehyde	Endrin ketone	gamma-BHC (Lindane)	gamma-Chlordane	PCB-1254 (Aroclor 1254)	PCB-1260 (Aroclor 1260)
Direct Exposure Human Health Risk Level Residential Soil Exposure ESL [1]					2.7E+03	1.8E+03	1.9E+03	--	--	--	4.8E+02	3.7E+01	2.1E+04	--	--	5.50E+02	--	2.30E+02	
Leaching to Groundwater Levels Non-drinking Water ESL [2]					6.5E+04	2.9E+04	5.6E+03	--	--	--	2.3E+04	6.3E+00	7.6E+00	--	--	7.4E+00	--	3.3E+05	
USEPA RSL for Resident Soil [3]					1.9E+03	2.0E+03	1.9E+03	8.6E+01	1.7E+03	3.0E+02	1.7E+03	3.4E+01	1.9E+04	--	--	5.7E+02	1.7E+03	2.4E+02	2.4E+02
Units					µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg
DG-AD13	4	0.5-1	DG-AD13S-0.5-1	2/1/2019	<1.2	<0.82	**5.1**	<1.1	**1.2 J**	<0.70	<6.3	<1.2	<0.90	<1.2	<0.65	<1.2	<0.90	<17	<17
DG-AD13	4	3.5-4	DG-AD13S-3.5-4	2/1/2019	<3.0 F2	<2.0 F2	<2.0 F2	<2.7	<1.9 F2	<1.8	<16	<2.9 F2	<2.2	<3.1	<1.6	<3.1	<2.2 F1	<17	<17
DG-AD13	4	7.5-8	DG-AD13S-7.5-8	2/1/2019	<6.1	<4.2	<4.1	<5.5	<4.0	<3.6	<32	<5.9	<4.6	<6.3	<3.3	<6.3	<4.6	<17	<17
DG-AD13 (D)	4	7.5-8	DG-AD13 (D)S-7.5-8	2/1/2019	<12	<8.3	<8.1	<11	<7.9	<7.1	<63	<12	<9.1	<12	<6.5	<12	<9.1	<17	<17
DG-AE11	4	0.5-1	DG-AE11S-0.5-1	1/21/2019	<0.59	<0.41	<0.40	<0.53	<0.39	<0.35	<2.8	<0.57	<0.45	<0.61	<0.32	<0.61	<0.45	<17	<17
DG-AE11	4	3.5-4	DG-AE11S-3.5-4	1/21/2019	<1.2	<0.81	<0.79	<1.1	<0.77	<0.69	<5.6	<1.1	<0.88	<1.2	<0.63	<1.2	<0.88	<17	<17
DG-AF13	4	0.5-1	DG-AF13S-0.5-1	11/21/2018	<12	<8.3	<8.1	<11	<7.9	<7.1	<63	<12	<9.1	<12	<6.5	<12	<9.1	<34	<34
DG-AF13	4	0.5-1	DG-AF13S-0.5-1	1/28/2019	<1.2	**2.2 J**	**14**	<1.1	**4.5**	<0.71	**64 J**	<1.2	<0.91	<1.2	<0.65	<1.2	**4.5**	<17	**41 J**
DG-AF13	4	3.5-4	DG-AF13S-3.5-4	11/21/2018	<29	<20	**42 J**	<26	<19	<17	<150	<28	<22	<30	<16	<30	<22	<34	<34
DG-AF13	4	3.5-4	DG-AF13S-3.5-4	1/28/2019	<0.60	<0.41	<0.40	<0.54	<0.39	<0.35	<3.2	<0.58	<0.45	<0.62	<0.33	<0.62	<0.45	<17	<17
DG-AF13	4	7-7.5	DG-AF13S-7-7.5	11/21/2018	<5.9	<4.0	<3.9	<5.3	<3.9	<3.5	<31	<5.7	<4.4	<6.1	<3.2	<6.1	<4.4	<17	<17
DG-AG11	4	0.5-1	DG-AG11S-0.5-1	1/21/2019	**3.3 J**	<0.79	**3.4 J**	<1.0	**2.1 J**	<0.68	<6.0	<1.1	<0.86	<1.2	<0.62	<1.2	**2.4 J**	<17	**28 J**
DG-AG11	4	3.5-4	DG-AG11S-3.5-4	1/21/2019	<0.58	<0.40	<0.39	<0.52	<0.38	<0.34	<3.1	<0.56	<0.44	<0.60	<0.31	<0.60	<0.44	<17	<17
DG-AG11	4	9.5-10	DG-AG11S-9.5-10	1/21/2019	<0.60	<0.42	<0.41	<0.54	<0.40	<0.36	<3.2	<0.58	<0.45	<0.62	<0.33	<0.62	<0.45	<17	<17
DG-AH13	4	0.5-1	DG-AH13S-0.5-1	1/29/2019	<1.2	<0.83	<0.81 UJ	<1.1	<0.79	<0.71 U	<6.3	<1.2	<0.91	<1.2 UJ	<0.65 UJ	<1.2	<0.91	<17 UJ	<17 UJ
DG-AH13	4	3.5-4	DG-AH13S-3.5-4	1/29/2019	<6.0	<4.2	<4.1	<5.4	<4.0	<3.6	<32	<5.8	<4.6	<6.2	<3.3	<6.2	<4.6	<17 UJ	<17 UJ
DG-AH13	4	7.5-8	DG-AH13S-7.5-8	1/29/2019	<6.1	<4.2	<4.1	<5.5	<4.0	<3.6	<32	<5.9	<4.6	<6.3	<3.3	<6.3	<4.6	<34	<34
DG-AI11	4	0.5-1	DG-AI11S-0.5-1	1/21/2019	<0.60	<0.41	<0.40	<0.54	<0.39	<0.35	<3.1	<0.58	<0.45	<0.62	<0.32	<0.62	<0.45	<17	<17
DG-AI11 (D)	4	0.5-1	DG-AI11 (D)S-0.5-1	1/21/2019	**1.3 J**	<0.41	<0.40	<0.54	<0.39	<0.35	<3.1	<0.58	<0.45	<0.62	<0.32	<0.62	<0.45	<17	<17
DG-AI11	4	3.5-4	DG-AI11S-3.5-4	1/21/2019	<3.0 U	<2.1	<2.0 U	<2.7	<2.0 U	<1.8 R	<14	<2.9	<2.3	<3.1	<1.6	<3.1 U	<2.3	<17	<17
DG-AI11	4	9.5-10	DG-AI11S-9.5-10	1/21/2019	<6.1	<4.2	<4.1	<5.5	<4.0	<3.6	<29	<5.9	<4.6	<6.3	<3.3	<6.3	<4.6	<17	<17
DG-AJ13	4	0.5-1	DG-AJ13S-0.5-1	1/29/2019	<6.0	<4.2	<4.1	<5.5	<4.0	<3.6	<32	<5.8	<4.6	<6.2	<3.3	<6.2	<4.6	<17 UJ	<17 UJ
DG-AJ13	4	3.5-4	DG-AJ13S-3.5-4	1/29/2019	<0.60	<0.41	<0.40	<0.54	<0.39	<0.36	<3.2	<0.58	<0.45	<0.62	<0.33	<0.62	<0.45	<17	<17
DG-AK11	4	0.5-1	DG-AK11S-0.5-1	1/22/2019	<0.60	<0.41	<0.40	<0.54	<0.39	<0.35	<2.9	<0.58	<0.45	<0.62	<0.33	<0.62	<0.45	<17	<17
DG-AK11	4	3.5-4	DG-AK11S-3.5-4	1/22/2019	<12	<8.0	<7.8	<11	<7.6	<6.9	<55	<11	<8.8	<12	<6.3	<12	<8.8	<17 UJ	<17 UJ
DG-AL13	4	0.5-1	DG-AL13S-0.5-1	1/29/2019	<0.60	<0.41	<0.40	<0.54	<0.39	<0.35	<3.1	<0.58	<0.45	<0.62	<0.32	<0.62	<0.45	<17	<17
DG-AL13	4	3.5-4	DG-AL13S-3.5-4	1/29/2019	<0.60	<0.41	<0.40	<0.54	<0.39	<0.36	<3.2	<0.58	<0.45	<0.62	<0.33	<0.62	<0.45	<17	<17
DG-AM11	4	0.5-1	DG-AM11S-0.5-1	1/22/2019	<0.58	<0.40	<0.39	<0.52	<0.38	<0.34	<3.1	<0.56	<0.44	<0.60	<0.31	<0.60	<0.44	<17	<17
DG-AM11	4	3.5-4	DG-AM11S-3.5-4	1/22/2019	<1.2	<0.83	<0.81	<1.1	<0.79	<0.71	<5.8	<1.2	<0.91	<1.2	<0.65	<1.2	<0.91	<17	<17
DG-AN13	4	0.5-1	DG-AN13S-0.5-1	1/31/2019	<1.5	**2.8 J**	<1.5	<1.5	<2.0	<1.5	<9.9	<1.5	<1.5	<1.5	<2.0	<1.5	<1.5	<17	<17
DG-AN13	4	3.5-4	DG-AN13S-3.5-4	1/31/2019	<1.5	<1.5	<1.5	<1.5	<2.0	<1.5	<9.9	<1.5	<1.5	<1.5	<2.0	<1.5	<1.5	<17	<17
DG-AN13	4	9.5-10	DG-AN13S-9.5-10	1/31/2019	<1.5	<1.5	<1.5	<1.5	<2.0	<1.5	<9.9	<1.5	<1.5	<1.5	<2.0	<1.5	<1.5	<17	<17
DG-AO11	5	0.5-1	DG-AO11S-0.5-1	1/22/2019	<1.2	<0.80	<0.78	<1.0	<0.76	<0.68	<5.5	<1.1	<0.87	<1.2	<0.63	<1.2	<0.87	<17	<17
DG-AO11	5	3.5-4	DG-AO11S-3.5-4	1/22/2019	<2.9	<2.0	<1.9	<2.6	<1.9	<1.7	<15	<2.8	<2.2	<3.0	<1.6	<3.0	<2.2	<17	<17
DG-AQ11	5	0.5-1	DG-AQ11S-0.5-1	1/30/2019	<1.5	<1.5	<1.5	<1.5	<2.0	<1.5	<9.9	<1.5	<1.5	<1.5	<2.0	<1.5	<1.5	<17	<17
DG-AQ11	5	3.5-4	DG-AQ11S-3.5-4	1/30/2019	<1.5	<1.5	<1.5	<1.5	<1.9	<1.5	<9.7	<1.5	<1.5	<1.5	<1.9	<1.5	<1.5	<17	<17
DG-AT9	5	0.5-1	DG-AT9S-0.5-1	1/30/2019	**5.6**	**63**	**85**	<1.5	<1.9	<1.5	<9.7	**3.2 J**	<1.5	<1.5	<1.9	<1.5	**2.3 J**	<16	**52**
DG-AT9	5	3.5-4	DG-AT9S-3.5-4	1/30/2019	<1.5	**4.4 J**	**1.8 J**	<1.5	<2.0	<1.5	<9.9	<1.5	<1.5	<1.5	<2.0	<1.5	<1.5	<17	<17

Table 4: Organochlorine Pesticides and Polychlorinated Biphenyls Concentrations in Soil
Brisbane Baylands OU-2
Brisbane, California

Sample Location	Investigation Zone	Depth Range (ft bgs)	Sample Name	Collection Date	4,4'-DDD	4,4'-DDE	4,4'-DDT	alpha-BHC	alpha-Chlordane	beta-BHC	Chlordane	Dieldrin	Endrin	Endrin aldehyde	Endrin ketone	gamma-BHC (Lindane)	gamma-Chlordane	PCB-1254 (Aroclor 1254)	PCB-1260 (Aroclor 1260)
Direct Exposure Human Health Risk Level Residential Soil Exposure ESL [1]					2.7E+03	1.8E+03	1.9E+03	--	--	--	4.8E+02	3.7E+01	2.1E+04	--	--	5.50E+02	--	2.30E+02	
Leaching to Groundwater Levels Non-drinking Water ESL [2]					6.5E+04	2.9E+04	5.6E+03	--	--	--	2.3E+04	6.3E+00	7.6E+00	--	--	7.4E+00	--	3.3E+05	
USEPA RSL for Resident Soil [3]					1.9E+03	2.0E+03	1.9E+03	8.6E+01	1.7E+03	3.0E+02	1.7E+03	3.4E+01	1.9E+04	--	--	5.7E+02	1.7E+03	2.4E+02	2.4E+02
Units					µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg
DG-AV9	5	0.5-1	DG-AV9S-0.5-1	2/1/2019	**120**	**280**	**220**	<1.1	**61**	<0.71	**340**	**1.5 J**	<0.90	<1.2	<0.65	<1.2	**51**	<17	<17
DG-AV9	5	3.5-4	DG-AV9S-3.5-4	2/1/2019	**3.2**	**9.5**	**6.5**	<0.53	**1.8 J**	<0.35	**18 J**	**2.5**	<0.44	<0.60	<0.32	<0.60	**2.1**	<17	**24 J**
DG-AV9	5	8.5-9	DG-AV9S-8.5-9	2/1/2019	**1.9**	**1.6 J**	**5.7**	<0.53	<0.38	<0.34	<3.1	<0.56	<0.44	<0.60	<0.32	<0.60	<0.44	<17	<17
DG-AX9	5	0.5-1	DG-AX9S-0.5-1	1/23/2019	<1.5	<1.5	<1.5	<1.5	<2.0	<1.5	<9.8	<1.5	<1.5	<1.5	<2.0	<1.5	<1.5	<17	<17
DG-AX9	5	3.5-4	DG-AX9S-3.5-4	1/23/2019	<1.5	<1.5	<1.5	<1.5	<2.0	<1.5	<10	<1.5	<1.5	<1.5	<2.0	<1.5	<1.5	<17	<17
DG-AX9	5	9.5-10	DG-AX9S-9.5-10	1/23/2019	<1.5	<1.5	<1.5	<1.5	<2.0	<1.5	<9.8	<1.5	<1.5	<1.5	<2.0	<1.5	<1.5	<17	<17
DG-AB17	6	0.5-1	DG-AB17S-0.5-1	1/24/2019	<1.5	<1.5	**3.4 J**	<1.5	**3.1 J**	<1.5	**38 J**	<1.5	<1.5	<1.5	<2.0	<1.5	**3.0 J**	<17	**43 J**
DG-AB17	6	3.5-4	DG-AB17S-3.5-4	1/24/2019	<1.5	**1.6 J**	<1.5	<1.5	<1.9	<1.5	<9.7	<1.5	<1.5	<1.5	<1.9	<1.5	<1.5	<17	<17
DG-AC15	6	0.5-1	DG-AC15S-0.5-1	1/31/2019	<1.5	<1.5	<1.5	<1.5	<2.0	<1.5	<9.9	<1.5	<1.5	<1.5	<2.0	<1.5	<1.5	<17	<17 UJ
DG-AC15 (D)	6	0.5-1	DG-AC15 (D)S-0.5-1	1/31/2019	<1.5	<1.5	<1.5	<1.5	<1.9	<1.5	<9.7	<1.5	<1.5	<1.5	<1.9	<1.5	<1.5	<17	**18 J**
DG-AC15	6	3.5-4	DG-AC15S-3.5-4	1/31/2019	<1.5	<1.5	<1.5	<1.5	<2.0	<1.5	<9.8	<1.5	<1.5	<1.5	<2.0	<1.5	<1.5	<17	<17
DG-AC15	6	7.5-8	DG-AC15S-7.5-8	1/31/2019	<3.0	<3.0	<3.0	<3.0	<4.0	<3.0	<20	<3.0	<3.0	<3.0	<4.0	<3.0	<3.0	<34	<34
DG-AD17	6	0.5-1	DG-AD17S-0.5-1	1/24/2019	<1.5	<1.5	<1.5	<1.5	<2.0	<1.5	<9.8	<1.5	<1.5	<1.5	<2.0	<1.5	<1.5	<17	<17
DG-AD17	6	3.5-4	DG-AD17S-3.5-4	1/24/2019	<1.5	<1.5	<1.5	<1.5	<2.0	<1.5	<10	<1.5	<1.5	<1.5	<2.0	<1.5	<1.5	<17	<17
DG-AD17	6	7-7.5	DG-AD17S-7-7.5	1/24/2019	<1.5	<1.5	<1.5	<1.5	<2.0	<1.5	<9.9	<1.5	<1.5	<1.5	<2.0	<1.5	<1.5	<17	<17
DG-AG15	6	0.5-1	DG-AG15S-0.5-1	1/24/2019	<1.5	<1.5	<1.5	<1.5	**2.2 J**	<1.5	**35 J**	<1.5	<1.5	<1.5	<2.0	<1.5	**3.5 J**	<17	<17
DG-AG15	6	3.5-4	DG-AG15S-3.5-4	1/24/2019	<1.5	<1.5	<1.5	<1.5	<2.0	<1.5	<9.9	<1.5	<1.5	<1.5	<2.0	<1.5	<1.5	<17	<17
DG-AG15	6	8.5-9	DG-AG15S-8.5-9	1/24/2019	<1.5	<1.5	<1.5	<1.5	<2.0	<1.5	<9.9	<1.5	<1.5	<1.5	<2.0	<1.5	<1.5	<17	<17
DG-AH17	6	0.5-1	DG-AH17S-0.5-1	1/24/2019	<1.5	<1.5	<1.5	<1.5	<2.0	<1.5	<9.8	<1.5	<1.5	<1.5	<2.0	<1.5	<1.5	<17	<17
DG-AI15	6	0.5-1	DG-AI15S-0.5-1	1/24/2019	**2.9 J**	**4.4 J**	**6.3**	<1.5	<1.9	<1.5	<9.7	<1.5	<1.5	<1.5	<1.9	<1.5	<1.5	**130**	**70**
DG-AI15	6	3.5-4	DG-AI15S-3.5-4	1/24/2019	<1.5	<1.5	<1.5	<1.5	<2.0	<1.5	<9.9	<1.5	<1.5	<1.5	<2.0	<1.5	<1.5	<17	<17
DG-AI15 (D)	6	3.5-4	DG-AI15 (D)S-3.5-4	1/24/2019	<1.5	<1.5	<1.5	<1.5	<2.0	<1.5	<9.9	<1.5	<1.5	<1.5	<2.0	<1.5	<1.5	<17	<17
DG-AJ17	6	0.5-1	DG-AJ17S-0.5-1	1/24/2019	<1.5	<1.5	<1.5	<1.5	<2.0	<1.5	<9.8	<1.5	<1.5	<1.5	<2.0	<1.5	<1.5	<17	<17
DG-AJ17	6	3.5-4	DG-AJ17S-3.5-4	1/24/2019	<1.5	<1.5	<1.5	<1.5	<2.0	<1.5	<9.9	<1.5	<1.5	<1.5	<2.0	<1.5	<1.5	<17	<17
DG-AJ17	6	9.5-10	DG-AJ17S-9.5-10	1/24/2019	<1.5	<1.5	<1.5	<1.5	<2.0	<1.5	<10	<1.5	<1.5	<1.5	<2.0	<1.5	<1.5	<17	<17
DG-AK15	6	0.5-1	DG-AK15S-0.5-1	1/23/2019	<1.5	<1.5	<1.5	<1.5	<2.0	<1.5	<9.9	<1.5	<1.5	<1.5	<2.0	<1.5	<1.5	<17	<17
DG-AK15	6	3.5-4	DG-AK15S-3.5-4	1/23/2019	<1.5	<1.5	<1.5	<1.5	<2.0	<1.5	<9.9	<1.5	<1.5	<1.5	<2.0	<1.5	<1.5	<17	<17
DG-AM15	6	0.5-1	DG-AM15S-0.5-1	1/23/2019	<1.5	<1.5	<1.5	<1.5	<2.0	<1.5	<9.8	<1.5	<1.5	<1.5	<2.0	<1.5	<1.5	<17	<17
DG-AM15	6	3.5-4	DG-AM15S-3.5-4	1/23/2019	**2.4 J**	**27**	**7.4 J**	<1.5	<2.0	<1.5	<10	**3.0 J**	<1.5	<1.5	<2.0	<1.5	<1.5	**170 J+**	<17
DG-AM15	6	9.5-10	DG-AM15S-9.5-10	1/23/2019	<1.5	<1.5	<1.5	<1.5	<2.0	<1.5	<9.9	<1.5	<1.5	<1.5	<2.0	<1.5	<1.5	<17	<17
DG-AM15 (D)	6	9.5-10	DG-AM15 (D)S-9.5-10	1/23/2019	<1.5	<1.5	<1.5	<1.5	<2.0	<1.5	<9.9	<1.5	<1.5	<1.5	<2.0	<1.5	<1.5	<17	<17
DG-AP13	6	0.5-1	DG-AP13S-0.5-1	1/23/2019	<1.5	<1.5	<1.5	<1.5	<1.9	<1.5	<9.7	<1.5	<1.5	<1.5	<1.9	<1.5	<1.5	<16	<16
DG-AP13 (D)	6	0.5-1	DG-AP13 (D)S-0.5-1	1/23/2019	<1.5	<1.5	<1.5	<1.5	<2.0	<1.5	<9.8	<1.5	<1.5	<1.5	<2.0	<1.5	<1.5	<17	<17
DG-AP13	6	3.5-4	DG-AP13S-3.5-4	1/23/2019	<1.5	<1.5	<1.5	<1.5	<2.0	<1.5	<10	<1.5	<1.5	<1.5	<2.0	<1.5	<1.5	<17	<17
DG-AP13	6	9.5-10	DG-AP13S-9.5-10	1/23/2019	<1.5	<1.5	<1.5	<1.5	<2.0	<1.5	<9.8	<1.5	<1.5	<1.5	<2.0	<1.5	<1.5	<17	<17
DG-AR13	6	0.5-1	DG-AR13S-0.5-1	1/23/2019	<1.5	<1.5	<1.5	<1.5	<2.0	<1.5	<9.8	<1.5	<1.5	<1.5	<2.0	<1.5	<1.5	<17	<17
DG-AR13	6	3.5-4	DG-AR13S-3.5-4	1/23/2019	<1.5	<1.5	<1.5	<1.5	<2.0	<1.5	<9.9	<1.5	<1.5	<1.5	<2.0	<1.5	<1.5	<17	<17
DG-AR13	6	9.5-10	DG-AR13S-9.5-10	1/23/2019	<1.5	<1.5	<1.5	<1.5	<2.0	<1.5	<9.9	<1.5	<1.5	<1.5	<2.0	<1.5	<1.5	<17	<17

Table 4: Organochlorine Pesticides and Polychlorinated Biphenyls Concentrations in Soil
Brisbane Baylands OU-2
Brisbane, California

Sample Location	Investigation Zone	Depth Range (ft bgs)	Sample Name	Collection Date	4,4'-DDD	4,4'-DDE	4,4'-DDT	alpha-BHC	alpha-Chlordane	beta-BHC	Chlordane	Dieldrin	Endrin	Endrin aldehyde	Endrin ketone	gamma-BHC (Lindane)	gamma-Chlordane	PCB-1254 (Aroclor 1254)	PCB-1260 (Aroclor 1260)
Direct Exposure Human Health Risk Level Residential Soil Exposure ESL [1]					2.7E+03	1.8E+03	1.9E+03	--	--	--	4.8E+02	3.7E+01	2.1E+04	--	--	5.50E+02	--	2.30E+02	
Leaching to Groundwater Levels Non-drinking Water ESL [2]					6.5E+04	2.9E+04	5.6E+03	--	--	--	2.3E+04	6.3E+00	7.6E+00	--	--	7.4E+00	--	3.3E+05	
USEPA RSL for Resident Soil [3]					1.9E+03	2.0E+03	1.9E+03	8.6E+01	1.7E+03	3.0E+02	1.7E+03	3.4E+01	1.9E+04	--	--	5.7E+02	1.7E+03	2.4E+02	2.4E+02
Units					µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg
DG-AS11	6	0.5-1	DG-AS11S-0.5-1	1/31/2019	<1.5	**2.7 J**	**3.3 J**	<1.5	<2.0	<1.5	<9.8	<1.5	<1.5	<1.5	<2.0	<1.5	<1.5	**46 J**	**29 J**
DG-AS11	6	3.5-4	DG-AS11S-3.5-4	1/31/2019	<4.5	<4.5	<4.5	<4.5	<6.0	<4.5	<30	<4.5	<4.5	<4.5	<6.0	<4.5	<4.5	<17	**27 J**
DG-AS11	6	7.5-8	DG-AS11S-7.5-8	1/31/2019	<4.3	<4.3	<4.3	<4.3	<5.7	<4.3	<29	<4.3	<4.3	<4.3	<5.7	<4.3	<4.3	<17	<17
DG-AT12	6	0.5-1	DG-AT12S-0.5-1	1/23/2019	<1.5	<1.5	<1.5	<1.5	<2.0	<1.5	<9.9	<1.5	<1.5	<1.5	<2.0	<1.5	<1.5	<17	<17
DG-AT12	6	3.5-4	DG-AT12S-3.5-4	1/23/2019	<1.5	<1.5	<1.5	<1.5	<1.9	<1.5	<9.7	<1.5	<1.5	**6.6**	<1.9	<1.5	<1.5	<17	<17
DG-AT12	6	9.5-10	DG-AT12S-9.5-10	1/23/2019	<1.5	<1.5	<1.5	<1.5	<1.9	<1.5	<9.7	<1.5	<1.5	<1.5	<1.9	<1.5	<1.5	<17	<17
DG-AU11	6	0.5-1	DG-AU11S-0.5-1	1/23/2019	<1.5	<1.5	<1.5	<1.5	<1.9	<1.5	<9.7	<1.5	<1.5	<1.5	<1.9	<1.5	<1.5	<17	<17
DG-AU11	6	3.5-4	DG-AU11S-3.5-4	1/23/2019	**1.5 J**	**15**	**39 J**	<1.5	<2.0	<1.5	<9.8	**11 J**	<1.5	<1.5	<2.0	<1.5	<1.5	**760 J+**	**560 J+**
DG-AU11	6	9.5-10	DG-AU11S-9.5-10	1/23/2019	<1.5	<1.5	<1.5	<1.5	<2.0	<1.5	<9.9	<1.5	<1.5	<1.5	<2.0	<1.5	<1.5	**22 J**	<17
DG-AW11	6	0.5-1	DG-AW11S-0.5-1	1/23/2019	<1.5	<1.5	**14 J**	<1.5	<1.9	<1.5	<9.7	<1.5	<1.5	**1.9 J**	<1.9	<1.5	<1.5	<17	**230**
DG-AW11	6	3.5-4	DG-AW11S-3.5-4	1/23/2019	<1.5	**27**	**4.7 J**	<1.5	<1.9	<1.5	<9.7	**2.4 J**	<1.5	**1.7 J**	<1.9	<1.5	<1.5	<16	**66**
DG-AW11	6	7.5-8	DG-AW11S-7.5-8	1/23/2019	**4.0 J**	**11**	**5.4**	<1.5	<2.0	<1.5	<9.9	<1.5	<1.5	<1.5	<2.0	<1.5	<1.5	<17	<17

Table 4: Organochlorine Pesticides and Polychlorinated Biphenyls Concentrations in Soil
Brisbane Baylands OU-2
Brisbane, California

Notes:

1. San Francisco Bay RWQCB, 2019. Summary of Soil ESLs, Jan. 2019 (Rev. 1) - Direct Exposure Human Health Risk Levels (Table S-1) Res: Shallow Soil Exposure.
2. San Francisco Bay RWQCB, 2019. Summary of Soil ESLs, Jan. 2019 (Rev. 1) - Leaching to Groundwater Levels (Table S-3) Non-drinking Water.
3. USEPA, 2018. Regional Screening Levels - Generic Tables (April 2019). Screening level for "Resident Soil."

- The lower RWQCB ESL is used as comparison criteria when available. If RWQCB ESLs are not available, EPA RSLs was selected for use as comparison criteria.
- Organochlorine pesticides were analyzed by USEPA Method 8081A.
- PCBs were analyzed by USEPA Method 8082.
- Only analytes with detections are included in this table.
- Non-detect results are presented with "<" followed by the MDL.
- Results in bold font indicate a detection above the MDL.
- Gray shading indicates a detection above the comparison criteria.

Abbreviations and Symbols:

"F1" - Matrix spike and/or matrix spike duplicate recovery is outside of acceptance limits.
"F2" - Matrix spike and/or matrix spike duplicate relative percent difference exceeds control limits.
"J" - Analyte was detected but the associated numerical value is the approximate concentration.
"J+" - Analyte was detected but the associated numerical value is likely to be higher than the concentration of the analyte in the sample due to positive bias of associated QC or calibration data or attributable to matrix interference.
"J-" - Analyte was detected but the associated numerical value is likely to be lower than the concentration of the analyte in the sample due to negative bias of associated QC or calibration data or attributable to matrix interference.
"R" - The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.
"U" - Not detected at or above the reported result.
"UJ" - The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
"--" - Not Available
"<" - Non-detect result
(D) - Duplicate sample
µg/kg - microgram per kilogram
ESL - Environmental Screening Level
ft bgs - Feet below ground surface
MDL - Method Detection Limit
PCB - Polychlorinated Biphenyl
QC - quality control
RSL - Regional Screening Level
RWQCB - Regional Water Quality Control Board
USEPA - United States Environmental Protection Agency

Table 5: Volatile Organic Compounds and Total Petroleum Hydrocarbons as Gasoline
Concentrations in Soil
Brisbane Baylands OU-2
Brisbane, California

Sample Location	Investigation Zone	Depth Range (ft bgs)	Sample Name	Collection Date	1,1,1-Trichloroethane	1,1,2-Trichloro-1,2,2-trifluoroethane	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	2-Butanone	4-Isopropyltoluene	4-Methyl-2-pentanone	Benzene	Carbon disulfide	Chloroform	cis-1,2-Dichloroethene	Ethylbenzene	Isopropylbenzene	Methyl-tert-butyl ether (MTBE)	Naphthalene	n-Butylbenzene	n-Propylbenzene	sec-Butylbenzene	tert-Butylbenzene	Tetrachloroethene (PCE)	Toluene	trans-1,2-Dichloroethene	Trichloroethene (TCE)	Vinyl Chloride	Xylenes, Total	TPH-Gasoline (C4-C12)
Direct Exposure Human Health Risk Level Residential Soil Exposure ESL [1]					1.7E+06	--	--	--	--	--	--	3.3E+02	--	3.2E+02	1.9E+04	5.9E+03	--	4.7E+04	3.8E+03	--	--	--	--	5.9E+02	1.1E+06	1.3E+05	9.5E+02	8.3E+00	5.8E+05	4.3E+05
Leaching to Groundwater Levels Non-drinking Water ESL [2]					7.0E+03	--	--	--	--	--	--	2.5E+01	--	2.3E+01	1.6E+03	4.3E+02	--	2.5E+03	1.2E+03	--	--	--	--	8.0E+01	1.0E+04	1.4E+04	8.5E+01	1.5E+00	1.0E+04	4.9E+03
USEPA RSL for Resident Soil [3]					8.1E+06	6.7E+06	3.0E+05	2.7E+05	2.7E+07	--	3.3E+07	1.2E+03	7.7E+05	3.2E+02	1.6E+05	5.8E+03	1.9E+06	4.7E+04	3.8E+03	3.9E+06	3.8E+06	7.8E+06	7.8E+06	2.4E+04	4.9E+06	1.6E+06	9.4E+02	5.9E+01	5.8E+05	--
Units					µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	mg/kg
DG-N1	1	0.5-1	DG-N1S-0.5-1	12/18/2018	<0.44	<4.4	<0.89	<0.89	<4.4	<0.44	<2.2	<0.44	<0.89	<0.44	<0.44	<0.44	<0.44	<0.89	<0.89	<0.89	<0.44	<0.89	<0.89	<0.44 U	<0.44	<0.44	<0.44	<0.89	<1.2	<0.062
DG-N1	1	3.5-4	DG-N1S-3.5-4	12/18/2018	<0.47	<4.7	<0.94	<0.94	<4.7	<0.47	<2.3	<0.47	<0.94	<0.47	<0.47	<0.47	<0.47	<0.94	<0.94	<0.94	<0.47	<0.94	<0.94	<0.47 U	<0.47	<0.47	<0.47	<0.94	<1.2	<0.066
DG-N4	1	4.5-5	DG-N4S-4.5-5	12/19/2018	<35	<140	<35	<35	<350	<35	<140	<35	<87	<35	<35	<35	<35	<70	**84 J**	<70	**35 J**	<35	<70	<35	<35	<35	<35	<70	<70	**39**
DG-N4	1	8.5-9	DG-N4S-8.5-9	12/19/2018	<0.29	<2.9	<0.57	<0.57	<2.9	<0.29	<1.4	<0.29	<0.57	<0.29	<0.29	<0.29	<0.29	<0.57	<0.57	<0.57	<0.29	<0.57	<0.57	<0.29	<0.29	<0.29	<0.29	<0.57	<0.74	**0.7**
DG-N5	1	0.5-1	DG-N5S-0.5-1	1/8/2019	<0.67	<6.7	<1.3	<1.3	<6.7	<0.67	<3.4	<0.67	<1.3	<0.67	<0.67	<0.67	<0.67	<1.3	<1.3	<1.3	<0.67	<1.3	<1.3	<0.67	<0.67	<0.67	<0.67	<1.3	<1.7	<0.094
DG-N5 (D)	1	0.5-1	DG-N5 (D)S-0.5-1	1/8/2019	<0.32	<3.2	<0.64	<0.64	<3.2	<0.32	<1.6	<0.32	<0.64	<0.32	<0.32	<0.32	<0.32	<0.64	<0.64	<0.64	<0.32	<0.64	<0.64	<0.32	<0.32	<0.32	<0.32	<0.64	<0.84	<0.045
DG-N5 (D)	1	0.5-1	DG-N5 (D)S-0.5-1	1/24/2019	<0.37	<3.7	<0.73	<0.73	<3.7	<0.37	<1.8	<0.37	<0.73	<0.37	<0.37	<0.37	<0.37	<0.73	<0.73	<0.73	<0.37	<0.73	<0.73	<0.37	<0.37	<0.37	<0.37	<0.73	<0.95	**0.47 J**
DG-N5	1	3.5-4	DG-N5S-3.5-4	1/8/2019	<0.29	<2.9	<0.59	<0.59	<2.9	<0.29	<1.5	<0.29	<0.59	<0.29	<0.29	<0.29	<0.29	<0.59	<0.59	<0.59	<0.29	<0.59	<0.59	<0.29	<0.29	<0.29	<0.29	<0.59	<0.77	<0.041
DG-O3	1	0.5-1	DG-O3S-0.5-1	12/18/2018	<0.43	<4.3	<0.87	<0.87	<4.3	<0.43	<2.2	<0.43	<0.87	<0.43	<0.43	<0.43	<0.43	<0.87	<0.87	<0.87	<0.43	<0.87	<0.87	<0.43 U	<0.43	<0.43	<0.43	<0.87	<1.1	<0.061
DG-O3	1	3.5-4	DG-O3S-3.5-4	12/18/2018	<0.44	<4.4	<0.88	<0.88	<4.4	<0.44	<2.2	<0.44	<0.88	<0.44	<0.44	<0.44	<0.44	<0.88	<0.88	<0.88	<0.44	<0.88	<0.88	<0.44 U	<0.44	<0.44	<0.44	<0.88	<1.1	<0.062
DG-O4	1	4.5-5	DG-O4S-4.5-5	12/19/2018	<210	<830	<210	<210	<2,100	<210	<830	<210	<520	<210	<210	<210	<210	<410	<410	<410	<210	<210	<410	<210	<210	<210	<210	<410	<410	**210**
DG-O4	1	7.5-8	DG-O4S-7.5-8	2/4/2019	<0.31	<3.1	<0.62	<0.62	<3.1	<0.31	<1.6	<0.31	<0.62	<0.31	<0.31	<0.31	<0.31	<0.62	<0.62	<0.62	<0.31	<0.62	<0.62	<0.31	<0.31	<0.31	<0.31	<0.62	<0.81	**0.31**
DG-O4	1	9.5-10	DG-O4S-9.5-10	12/19/2018	<0.30	<3.0	<0.60	<0.60	<3.0	<0.30	<1.5	<0.30	**1.5**	<0.30	<0.30	<0.30	<0.30	<0.60	<0.60	<0.60	<0.30	<0.60	<0.60	<0.30	<0.30	<0.30	<0.30	<0.60	<0.78	**0.94**
DG-P1	1	0.5-1	DG-P1S-0.5-1	12/18/2018	<0.42	<4.2	<0.83	<0.83	<4.2	<0.42	<2.1	<0.42	<0.83	<0.42	<0.42	<0.42	<0.42	<0.83	<0.83	<0.83	<0.42	<0.83	<0.83	<0.42 U	<0.42	<0.42	<0.42	<0.83	<1.1	<0.058
DG-P1 (D)	1	0.5-1	DG-P1 (D)S-0.5-1	12/18/2018	<0.36	<3.6	<0.72	<0.72	<3.6	<0.36	<1.8	<0.36	<0.72	<0.36	<0.36	<0.36	<0.36	<0.72	<0.72	<0.72	<0.36	<0.72	<0.72	<0.36 U	<0.36	<0.36	<0.36	<0.72	<0.94	<0.051
DG-P1	1	3.5-4	DG-P1S-3.5-4	12/18/2018	<0.42	<4.2	<0.84	<0.84	<4.2	<0.42	<2.1	<0.42	<0.84	<0.42	<0.42	<0.42	<0.42	<0.84	<0.84	<0.84	<0.42	<0.84	<0.84	<0.42	<0.42	<0.42	<0.42	<0.84	<1.1	<0.059
DG-P4	1	4.5-5	DG-P4S-4.5-5	12/19/2018	<270	<1,100	<270	<270	<2,700	<270	<1,100	<270	<680	<270	<270	<270	<270	<540	<540	<540	<270	<270	<540	<270	<270	<270	<270	<540	<540	**260**
DG-P4	1	7.5-8	DG-P4S-7.5-8	12/19/2018	<37	<150	<37	<37	<370	<37	<150	<37	<91	<37	<37	<37	<37	<73	<73	<73	<37	<37	<73	<37	<37	<37	<37	<73	<73	**20**
DG-P5	1	0.5-1	DG-P5S-0.5-1	1/8/2019	<0.36	<3.6	<0.71	<0.71	<3.6	<0.36	<1.8	<0.36	<0.71	<0.36	<0.36	<0.36	<0.36	<0.71	<0.71	<0.71	<0.36	<0.71	<0.71	<0.36	<0.36	<0.36	<0.36	<0.71	<0.93	<0.050
DG-P5	1	3.5-4	DG-P5S-3.5-4	1/8/2019	<0.41	<4.1	<0.81	<0.81	<4.1	<0.41	<2.0	<0.41	<0.81	<0.41	<0.41	<0.41	<0.41	<0.81	<0.81	<0.81	<0.41	<0.81	<0.81	<0.41	<0.41	<0.41	<0.41	<0.81	<1.1	<0.057
DG-Q3	1	0.5-1	DG-Q3S-0.5-1	12/18/2018	<0.37	<3.7	<0.74	<0.74	<3.7	<0.37	<1.8	<0.37	<0.74	<0.37	<0.37	<0.37	<0.37	<0.74	<0.74	<0.74	<0.37	<0.74	<0.74	<0.37 U	<0.37	<0.37	<0.37	<0.74	<0.96	<0.052
DG-Q3	1	3.5-4	DG-Q3S-3.5-4	12/18/2018	<0.35	<3.5	<0.69	<0.69	<3.5	<0.35	<1.7	<0.35	<0.69	<0.35	<0.35	<0.35	<0.35	<0.69	<0.69	<0.69	<0.35	<0.69	<0.69	<0.35	<0.35	<0.35	<0.35	<0.69	<0.90	<0.048
DG-Q7	1	0.5-1	DG-Q7S-0.5-1	1/8/2019	<0.39	<3.9	<0.78	<0.78	<3.9	<0.39	<2.0	<0.39	<0.78	<0.39	<0.39	<0.39	<0.39	<0.78	<0.78	<0.78	<0.39	<0.78	<0.78	<0.39	<0.39	<0.39	<0.39	<0.78	<1.0	<0.055
DG-Q7	1	3.5-4	DG-Q7S-3.5-4	1/8/2019	<0.37	<3.7	<0.75	<0.75	<3.7	<0.37	<1.9	<0.37	<0.75	<0.37	<0.37	<0.37	<0.37	<0.75	<0.75	<0.75	<0.37	<0.75	<0.75	<0.37	<0.37	<0.37	<0.37	<0.75	<0.97	<0.052
DG-Q7 (D)	1	3.5-4	DG-Q7 (D)S-3.5-4	1/8/2019	<0.36	<3.6	<0.72	<0.72	<3.6	<0.36	<1.8	<0.36	<0.72	<0.36	<0.36	<0.36	<0.36	<0.72	<0.72	<0.72	<0.36	<0.72	<0.72	<0.36	<0.36	<0.36	<0.36	<0.72	<0.93	<0.050
DG-R1	1	0.5-1	DG-R1S-0.5-1	12/17/2018	<0.36	<3.6	<0.72	<0.72	<3.6	<0.36	<1.8	<0.36	<0.72	<0.36	<0.36	<0.36	<0.36	<0.72	<0.72	<0.72	<0.36	<0.72	<0.72	<0.36 *	<0.36	<0.36	<0.36	<0.72	<0.93	<0.050
DG-R1	1	3.5-4	DG-R1S-3.5-4	12/17/2018	<0.46	<4.6	<0.92	<0.92	<4.6	<0.46	<2.3	<0.46	<0.92	<0.46	<0.46	<0.46	<0.46	<0.92	<0.92	<0.92	<0.46	<0.92	<0.92	<0.46	<0.46	<0.46	<0.46	<0.92	<1.2	<0.064
DG-R5	1	0.5-1	DG-R5S-0.5-1	1/29/2019	<0.45	<4.5	<0.90 U	<0.90 U	<4.5	<0.45 U	<2.2	<0.45	<0.90	<0.45	<0.45	<0.45	<0.45	<0.90	<0.90	<0.90 U	<0.45 U	<0.90 U	<0.90 U	<0.45	<0.45	<0.45	<0.45	<0.90	<1.2	<0.063
DG-R5	1	3.5-4	DG-R5S-3.5-4	1/29/2019	<0.38	<3.8	<0.76 U	<0.76 U	<3.8	<0.38 U	<1.9	<0.38	<0.76	<0.38	<0.38	<0.38	<0.38	<0.76	<0.76	<0.76 U	<0.38 U	<0.76 U	<0.76 U	<0.38	<0.38	<0.38	<0.38	<0.76	<0.99	<0.054
DG-R5 (D)	1	3.5-4	DG-R5 (D)S-3.5-4	1/29/2019	<0.37	<3.7	<0.73	<0.73	<3.7	<0.37	<1.8 R	<0.37	<0.73	<0.37	<0.37	<0.37	<0.37	<0.73	<0.73	<0.73	<0.37	<0.73	<0.73	<0.37	<0.37	<0.37	<0.37	<0.73	<0.95	<0.051
DG-S3	1	0.5-1	DG-S3S-0.5-1	12/18/2018	<0.40	<4.0	<0.79	<0.79	<4.0	<0.40	<2.0	<0.40	<0.79	<0.40	<0.40	<0.40	<0.40	<0.79	<0.79	<0.79	<0.40	<0.79	<0.79	<0.40	<0.40	<0.40	<0.40	<0.79	<1.0	<0.056
DG-S3	1	3.5-4	DG-S3S-3.5-4	12/18/2018	<0.44 UJ	<4.4 UJ	<0.87 UJ	<0.87 UJ	<4.4 UJ	<0.44 UJ	<2.2 UJ	<0.44 UJ	<0.87 UJ	<0.44 UJ	<0.44 UJ	<0.44 UJ	<0.44 UJ	<0.87 UJ	<0.87 UJ	<0.87 UJ	<0.44 UJ	<0.87 UJ	<0.87 UJ	<0.44 UJ	<0.44 UJ	<0.44 UJ	<0.44 UJ	<0.87 UJ	<1.1 UJ	<0.068
DG-S7	1	0.5-1	DG-S7S-0.5-1	1/8/2019	<0.36	<3.6	<0.73	<0.73	<3.6	<0.36	<1.8	<0.36	<0.73	<0.36	<0.36	<0.36	<0.36	<0.73	<0.73	<0.73	<0.36	<0.73	<0.73	<0.36	<0.36	<0.36	<0.36	<0.73	<0.95	<0.051
DG-S7	1	3.5-4	DG-S7S-3.5-4	1/8/2019	<0.35	<3.5	<0.70	<0.70	<3.5	<0.35	<1.8	<0.35	<0.70	<0.35	<0.35	<0.35	<0.35	<0.70	<0.70	<0.70	<0.35	<0.70	<0.70	<0.35	<0.35	<0.35	<0.35	<0.70	<0.92	<0.049
DG-S7	1	3.5-4	DG-S7S-3.5-4	2/4/2019	<0.42	<4.2	<0.84	<0.84	<4.2	<0.42	<2.1	<0.42	<0.84	<0.42	<0.42	<0.42	<0.42	<0.84	<0.84	<0.84	<0.42	<0.84	<0.84	<0.42	<0.42	<0.42	<0.42	<0.84	<1.1	<0.059
DG-T1	1	0.5-1	DG-T1S-0.5-1	12/17/2018	<0.44	<4.4	<0.89	<0.89	<4.4	<0.44	<2.2 F1	<0.44	<0.89	<0.44	<0.44	<0.44	<0.44	<0.89	<0.89	<0.89	<0.44	<0.89	<0.89	<0.44	<0.44	<0.44	<0.44	<0.89	<1.2	<0.062
DG-T1	1	3.5-4	DG-T1S-3.5-4	12/17/2018	<0.53	<5.3	<1.1	<1.1	<5.3	<0.53	<2.7	<0.53	<1.1	<0.53	<0.53	<0.53	<0.53	<1.1	<1.1	<1.1	<0.53	<1.1	<1.1	<0.53 *	<0.53	<0.53	<0.53	<1.1	<1.4	<0.075
DG-T1 (D)	1	3.5-4	DG-T1 (D)S-3.5-4	12/17/2018	<0.95	<9.5	<1.9	<1.9	<9.5	<0.95	<4.8	<0.95	<1.9	<0.95	<0.95	<0.95	<0.95	<1.9	<1.9 UJ	<1.9	<0.95	<1.9	<1.9	<0.95	<0.95	<0.95	<0.95	<1.9	<2.5	<0.13
DG-T5	1	0.5-1	DG-T5S-0.5-1	1/8/2019	<0.44	<4.4	<0.87	<0.87	<4.4	<0.44	<2.2	<0.44	<0.87	<0.44	<0.44	<0.44	<0.44	<0.87	<0.75	<0.87	<0.44	<0.87	<0.87	<0.44	<0.44	<0.44	<0.44	<0.87	<1.1	<0.061
DG-T5	1	3.5-4	DG-T5S-3.5-4	1/8/2019	<0.33	<3.3	<0.66	<0.66	<3.3	<0.33	<1.7	<0.33	<0.66	<0.33	<0.33	<0.33	<0.33	<0.66	<0.66	<0.66	<0.33	<0.66	<0.66	<0.33	<0.33	<0.33	<0.33	<0.66	<0.86	<0.046
DG-U3	1	0.5-1	DG-U3S-0.5-1	12/18/2018	<0.43	<4.3	<0.85	<0.85	<4.3	<0.43	<2.1	<0.43	<0.85	<0.43	<0.43	<0.43	<0.43	<0.85	<0.85	<0.85	<0.43	<0.85	<0.85	<0.43	<0.43	<0.43	<0.43	<0.85	<1.1	<0.060
DG-U3	1	3.5-4	DG-U3S-3.5-4	12/18/2018	<0.55	<5.5	<1.1	<1.1	<5.5	<0.55	<2.8	<0.55	<1.1	<0.55	<0.55	<0.55	<0.55	<1.1	<1.1	<1.1	<0.55	<1.1	<1.1	<0.55	<0.55	<0.55	**2.3**	<1.1	<1.4	<0.077
DG-U3 (D)	1	3.5-4	DG-U3 (D)S-3.5-4	12/18/2018	<0.36	<3.6	<0.73	<0.73	<3.6	<0.36	<1.8	<0.36	<0.73	<0.36	<0.36	<0.36	<0.36	<0.73	<0.73	<0.73	<0.36	<0.73	<0.73	<0.36	<0.36	<0.36	**2.1**	<0.73	<0.94	**0.18 J**
DG-U7	1	0.5-1	DG-U7S-0.5-1	1/8/2019	<0.36	<3.6	<0.71	<0.71	<3.6	<0.36	<1.8	<0.36	<0.71	<0.36	<0.36	<0.36	<0.36	<0.71	<0.71	<0.71	<0.36	<0.71	<0.71	<0.36	<0.36	<0.36	<0.36	<0.71	<0.93	<0.050
DG-U7	1	3.5-4	DG-U7S-3.5-4	1/8/2019	<0.36	<3.6	<0.71	<0.71	**15**	<0.36	<1.8	<0.36	<1.1	<0.36	<0.36	<0.36	<0.36	<0.71	<0.71	<0.71	<0.36	<0.71	<0.71	<0.36	<0.36	<0.36	<0.36	<0.71	<0.93	<0.050
DG-U7	1	3.5-4	DG-U7S-3.5-4	2/4/2019	<0.39	<3.9	<0.78	<0.78	**11**	<0.39	<2.0	<0.39	<0.78	<0.39	<0.39	<0.39	<0.39	<0.78	<0.78	<0.78	<0.39	<0.78	<0.78	<0.39	<0.39	<0.39	<0.39	<0.78	<1.0	<0.055
DG-V1	1	0.5-1	DG-V1S-0.5-1	12/17/2018	<0.37	<3.7	<0.75	<0.75	<3.7	<0.37	<1.9	<0.37	<0.75	<0.37	<0.37	<0.37	<0.37	<0.75	<0.75	<0.75	<0.37	<0.75	<0.75	<0.37 *	<0.37	<0.37	<0.37	<0.75	<0.97	<0.052
DG-V1	1	3.5-4	DG-V1S-3.5-4	12/17/2018	<0.56	<5.6	<1.1	<1.1	<5.6	<0.56	<2.8	<0.56	<1.1	<0.56	<0.56	<0.56	<0.56	<1.1	<1.1	<1.1	<0.56	<1.1	<1.1	<0.56 *	<0.56	<0.56	<0.56	<1.1	<1.5	<0.078
DG-V5	1	0.5-1	DG-V5S-0.5-1	1/8/2019	<0.43	<4.3	<0.86	<0.86	<4.3	<0.43	<2.2	<0.43	<0.86	<0.43	<0.43	<0.43	<0.43	<0.86	<0.86	<0.86	<0.43	<0.86	<0.86	<0.43	<0.43	<0.43	<0.43	<0.86	<1.1	<0.060
DG-V5	1	3.5-4	DG-V5S-3.5-4	1/8/2019	<0.34	<3.4	<0.69	<0.69	<3.4	<0.34	<1.7	**2.2**	<0.69	<0.34	<0.34	<0.34	<0.34	<0.69	<0.69	<0.69	<0.34	<0.69	<0.69	<0.34	**1.1**	<0.34	<0.34	<0.69	<0.90	<0.048
DG-V5	1	7.5-8	DG-V5S-7.5-8	1/8/2019	<0.34	<3.4	<0.69	<0.69	<3.4	<0.34	<1.7	<0.34	<0.69	<0.34	<0.34	<0.34	<0.34	<0.69	<0.69	<0.69	<0.34	<0.69	<0.69	<0.34	<0.34	<0.34	<0.34	<0.69	<0.90	<0.048
DG-V9	1	0.5-1	DG-V9S-0.5-1	1/10/2019	<0.37	<3.7	<0.74	<0.74	<3.7	<0.37	<1.8	<0.37	<0.74	<0.37	<0.37	<0.37	<0.37	<0.74	<0.74	<0.74	<0.37	<0.74	<0.74	<0.37	<0.37	<0.37	<0.37	<0.74	<0.96	<0.052
DG-V9	1	3.5-4	DG-V9S-3.5-4	1/10/2019	<0.39	<3.9	<0.78	<0.78	<3.9	<0.39	<1.9	<0.39	<0.78	<0.39	<0.39	<0.39	<0.39	<0.78	<0.78	<0.78	<0.39	<0.78	<0.78	<0.39	<0.39	<0.39	<0.39	<0.78	<1.0	<0.054
DG-V9	1	7.5-8	DG-V9S-7.5-8	1/10/2019	<0.36	<3.6	<0.71	<0.71	<3.6	<0.36	<1.8	<0.36	<0.71	<0.36	<0.36	<0.36	<0.36	<0.71	<0.71	<0.71	<0.36	<0.71	<0.71	<0.36	<0.36	<0.36	<0.36	<0.71	<0.93	<0.050
DG-W3	1	0.5-1	DG-W3S-0.5-1	12/18/2018	<0.44	<4.4	<0.87	<0.87	<4.4	<0.44	<2.2	<0.44	<0.87	<0.44	<0.44	<0.44	<0.44	<0.87	<0.87	<0.87	<0.44	<0.87	<0.87	<0.44	<0.44	<0.44	<0.44	<0.87	<1.1	<0.061
DG-W3	1	3.5-4	DG-W3S-3.5-4	12/18/2018	<0.61	<6.1	<1.2	<1.2	<6.1	<0.61	<3.0	<0.61	<1.2	<0.61	<0.61	<0.61	<0.61	<1.2	<1.2	<1.2	<0.61	<1.2	<1.2	<0.61	<0.61	<0.61	<0.61	<1.2	<1.6	<0.085
DG-W7	1	0.5-1	DG-W7S-0.5-1	1/29/2019	<0.36	<3.6	<0.72 U	<0.72 U	<3.6	<0.36 U	<1.8	<0.36	<0.72	<0.36	<0.36	<0.36	<0.36	<0.72	<0.72	<0.72 U	<0.36 U	<0.72 U	<0.72 U	<0.36	**0.40 J**	<0.36	<0.36	<0.72	<0.94	<0.050

Table 5: Volatile Organic Compounds and Total Petroleum Hydrocarbons as Gasoline
Concentrations in Soil
Brisbane Baylands OU-2
Brisbane, California

Sample Location	Investigation Zone	Depth Range (ft bgs)	Sample Name	Collection Date	1,1,1-Trichloroethane	1,1,2-Trichloro-1,2,2-trifluoroethane	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	2-Butanone	4-Isopropyltoluene	4-Methyl-2-pentanone	Benzene	Carbon disulfide	Chloroform	cis-1,2-Dichloroethene	Ethylbenzene	Isopropylbenzene	Methyl-tert-butyl ether (MTBE)	Naphthalene	n-Butylbenzene	n-Propylbenzene	sec-Butylbenzene	tert-Butylbenzene	Tetrachloroethene (PCE)	Toluene	trans-1,2-Dichloroethene	Trichloroethene (TCE)	Vinyl Chloride	Xylenes, Total	TPH-Gasoline (C4-C12)
Direct Exposure Human Health Risk Level Residential Soil Exposure ESL [1]					1.7E+06	--	--	--	--	--	--	3.3E+02	--	3.2E+02	1.9E+04	5.9E+03	--	4.7E+04	3.8E+03	--	--	--	--	5.9E+02	1.1E+06	1.3E+05	9.5E+02	8.3E+00	5.8E+05	4.3E+05
Leaching to Groundwater Levels Non-drinking Water ESL [2]					7.0E+03	--	--	--	--	--	--	2.5E+01	--	2.3E+01	1.6E+03	4.3E+02	--	2.5E+03	1.2E+03	--	--	--	--	8.0E+01	1.0E+04	1.4E+04	8.5E+01	1.5E+00	1.0E+04	4.9E+03
USEPA RSL for Resident Soil [3]					8.1E+06	6.7E+06	3.0E+05	2.7E+05	2.7E+07	--	3.3E+07	1.2E+03	7.7E+05	3.2E+02	1.6E+05	5.8E+03	1.9E+06	4.7E+04	3.8E+03	3.9E+06	3.8E+06	7.8E+06	7.8E+06	2.4E+04	4.9E+06	1.6E+06	9.4E+02	5.9E+01	5.8E+05	--
Units					µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	mg/kg
DG-W7	1	3.5-4	DG-W7S-3.5-4	1/29/2019	<0.43	<4.3	<0.87 U	<0.87 U	<4.3	<0.43 U	<2.2	**0.46 J**	<0.87	<0.43	<0.43	<0.43	<0.43	<0.87	<0.87	<0.87 U	<0.43 U	<0.87 U	<0.87 U	<0.43	<0.43	<0.43	<0.43	<0.87	<1.1	<0.061
DG-X1	1	0.5-1	DG-X1S-0.5-1	12/17/2018	<0.43	<4.3	<0.86	<0.86	<4.3	<0.43	<2.1	<0.43	<0.86	<0.43	<0.43	<0.43	<0.43	<0.86	<0.86	<0.86	<0.43	<0.86	<0.86	<0.43 *	<0.43	<0.43	<0.43	<0.86	<1.1	<0.060
DG-X1 (D)	1	0.5-1	DG-X1 (D)S-0.5-1	12/17/2018	<0.40	<4.0	<0.80	<0.80	<4.0	<0.40	<2.0	<0.40	<0.80	<0.40	<0.40	<0.40	<0.40	<0.80	<0.80	<0.80	<0.40	<0.80	<0.80	<0.40 *	<0.40	<0.40	<0.40	<0.80	<1.0	<0.056
DG-X1	1	3.5-4	DG-X1S-3.5-4	12/17/2018	<0.48	<4.8	<0.97	<0.97	<4.8	<0.48	<2.4	<0.48	<0.97	<0.48	<0.48	<0.48	<0.48	<0.97	<0.97	<0.97	<0.48	<0.97	<0.97	<0.48 *	<0.48	<0.48	<0.48	<0.97	<1.3	<0.068
DG-X5	1	0.5-1	DG-X5S-0.5-1	1/8/2019	<0.37	<3.7	<0.74	<0.74	**20**	<0.37	<1.9	<0.37	<0.74	<0.37	<0.37	<0.37	<0.37	<0.74	<0.74	<0.74	<0.37	<0.74	<0.74	<0.37	<0.37	<0.37	<0.37	<0.74	<0.97	<0.052
DG-X5	1	3.5-4	DG-X5S-3.5-4	1/8/2019	<0.29	<2.9	<0.57	<0.57	<2.9	<0.29	<1.4	<0.29	<0.57	<0.29	<0.29	<0.29	<0.29	<0.57	<0.57	<0.57	<0.29	<0.57	<0.57	<0.29	<0.29	<0.29	<0.29	<0.57	<0.74	<0.040
DG-X9	1	0.5-1	DG-X9S-0.5-1	1/10/2019	<0.42	<4.2	<0.84	<0.84	<4.2	<0.42	<2.1	<0.42	<0.84	<0.42	<0.42	<0.42	<0.42	<0.84	<0.84	<0.84	<0.42	<0.84	<0.84	<0.42	<0.42	<0.42	<0.42	<0.84	<1.1	<0.059
DG-X9	1	3.5-4	DG-X9S-3.5-4	1/10/2019	<0.39	<3.9	<0.79	<0.79	<4.9	<0.39	<2.0	<0.39	<0.79	<0.39	<0.39	<0.39	<0.39	<0.79	<0.79	<0.79	<0.39	<0.79	<0.79	<0.39	<0.39	<0.39	<0.39	<0.79	<1.0	<0.055
DG-Y3	1	0.5-1	DG-Y3S-0.5-1	12/18/2018	<0.44	<4.4	<0.88	<0.88	<4.4	<0.44	<2.2	<0.44	<0.88	<0.44	<0.44	<0.44	<0.44	<0.88	<0.88	<0.88	<0.44	<0.88	<0.88	<0.44	<0.44	<0.44	<0.44	<0.88	<1.1	<0.061
DG-Y3	1	3.5-4	DG-Y3S-3.5-4	12/18/2018	<0.48	<4.8	<0.97	<0.97	<4.8	<0.48	<2.4	<0.48	<0.97	<0.48	<0.48	<0.48	<0.48	<0.97	<0.97	<0.97	<0.48	<0.97	<0.97	<0.48	<0.48	<0.48	<0.48	<0.97	<1.3	<0.068
DG-Y7	1	0.5-1	DG-Y7S-0.5-1	1/9/2019	<0.37	<3.7	<0.74	<0.74	<3.7	<0.37	<1.9	<0.37	<0.74	<0.37	<0.37	<0.37	<0.37	<0.74	<0.74	<0.74	<0.37	<0.74	<0.74	<0.37	<0.37	<0.37	<0.37	<0.74	<0.97	<0.052
DG-Y7	1	3.5-4	DG-Y7S-3.5-4	1/9/2019	<0.41	<4.1	<0.82	<0.82	<4.1	<0.41	<2.1	<0.41	<0.82	<0.41	<0.41	<0.41	<0.41	<0.82	<0.82	<0.82	<0.41	<0.82	<0.82	<0.41	<0.41	<0.41	<0.41	<0.82	<1.1	<0.058
DG-Z5	1	0.5-1	DG-Z5S-0.5-1	1/8/2019	<0.37	<3.7	<0.74	<0.74	<3.7	<0.37	<1.8	<0.37	<0.74	<0.37	<0.37	<0.37	<0.37	<0.74	<0.74	<0.74	<0.37	<0.74	<0.74	<0.37	<0.37	<0.37	<0.37	<0.74	<0.96	<0.051
DG-Z5	1	3.5-4	DG-Z5S-3.5-4	1/8/2019	<0.34	<3.4	<0.69	<0.69	<3.4	<0.34	<1.7	<0.34	<0.69	<0.34	<0.34	<0.34	<0.34	<0.69	<0.69	<0.69	<0.34	<0.69	<0.69	<0.34	<0.34	<0.34	<0.34	<0.69	<0.90	<0.048
DG-Z9	1	0.5-1	DG-Z9S-0.5-1	1/9/2019	<0.44	<4.4	<0.88	<0.88	<4.4	<0.44	<2.2	<0.44	<0.88	<0.44	<0.44	<0.44	<0.44	<0.88	<0.88	<0.88	<0.44	<0.88	<0.88	<0.44	<0.44	<0.44	<0.44	<0.88	<1.1	<0.061
DG-Z9 (D)	1	0.5-1	DG-Z9 (D)S-0.5-1	1/9/2019	<0.52	<5.2	<1.0	<1.0	<5.2	<0.52	<2.6	<0.52	<1.0	<0.52	<0.52	<0.52	<0.52	<1.0	<1.0	<1.0	<0.52	<1.0	<1.0	<0.52	<0.52	<0.52	<0.52	<1.0	<1.4	<0.073
DG-Z9	1	3.5-4	DG-Z9S-3.5-4	1/9/2019	<0.42	<4.2	<0.85	<0.85	<4.2	<0.42	<2.1	<0.42	<0.85	<0.42	<0.42	<0.42	<0.42	<0.85	<0.85	<0.85	<0.42	<0.85	<0.85	<0.42	<0.42	<0.42	<0.42	<0.85	<1.1	<0.059
DG-AA3	1	0.5-1	DG-AA3S-0.5-1	12/18/2018	<0.60	<6.0	<1.2	<1.2	**35 J**	<0.60	<3.0	<0.60	<1.2	<0.60	<0.60	<0.60	<0.60	<1.2	<1.2	<1.2	<0.60	<1.2	<1.2	<0.60	<0.60	<0.60	<0.60	<1.2	<1.6	<0.084
DG-AA3 (D)	1	0.5-1	DG-AA3 (D)S-0.5-1	12/18/2018	<0.42	<4.2	<0.83	<0.83	<4.2 UJ	<0.42	<2.1	<0.42	<0.83	<0.42	<0.42	<0.42	<0.42	<0.83	<0.83	<0.83	<0.42	<0.83	<0.83	<0.42	<0.42	<0.42	<0.42	<0.83	<1.1	<0.058
DG-AA3	1	3.5-4	DG-AA3S-3.5-4	12/18/2018	<0.35	<3.5	<0.71	<0.71	<3.5	<0.35	<1.8	<0.35	<0.71	<0.35	<0.35	<0.35	<0.35	<0.71	<0.71	<0.71	<0.35	<0.71	<0.71	<0.35	<0.35	<0.35	<0.35	<0.71	<0.92	<0.050
DG-AA3	1	7-7.5	DG-AA3S-7-7.5	12/18/2018	<0.46	<4.6	<0.92	<0.92	<4.6	<0.46	<2.3	<0.46	<0.92	<0.46	<0.46	<0.46	<0.46	<0.92	<0.92	<0.92	<0.46	<0.92	<0.92	<0.46	<0.46	<0.46	<0.46	<0.92	<1.2	<0.064
DG-AA7	1	0.5-1	DG-AA7S-0.5-1	1/9/2019	<0.36	<3.6	<0.72	<0.72	<3.6	<0.36	<1.8	<0.36	<0.72	<0.36	<0.36	<0.36	<0.36	<0.72	<0.72	<0.72	<0.36	<0.72	<0.72	<0.36	<0.36	<0.36	<0.36	<0.72	<0.94	<0.051
DG-AA7	1	3.5-4	DG-AA7S-3.5-4	1/9/2019	<0.37	<3.7	<0.74	<0.74	<3.7	<0.37	<1.9	<0.37	<0.74	<0.37	<0.37	<0.37	<0.37	<0.74	<0.74	<0.74	<0.37	<0.74	<0.74	<0.37	<0.37	<0.37	<0.37	<0.74	<0.96	<0.052
DG-AB5	1	0.5-1	DG-AB5S-0.5-1	1/29/2019	<0.32	<3.2	<0.64 U	<0.64 U	<3.2	<0.32 U	<1.6	<0.32	<0.64	<0.32	<0.32	<0.32	<0.32	<0.64	<0.64	<0.64 U	<0.32 U	<0.64 U	<0.64 U	<0.32	<0.32 UJ	<0.32	<0.32	<0.64	<0.83	<0.045
DG-AB5 (D)	1	0.5-1	DG-AB5 (D)S-0.5-1	1/29/2019	<0.31	<3.1	<0.62	<0.62	<3.1	<0.31	<1.7 R	<0.31	<0.62	<0.31	<0.31	<0.31	<0.31	<0.62	<0.62	<0.62	<0.31	<0.62	<0.62	<0.31	**0.45 J**	<0.31	<0.31	<0.62	<0.81	<0.044
DG-AB5	1	3.5-4	DG-AB5S-3.5-4	1/29/2019	<0.38	<3.8	<0.77	<0.77	<3.8	<0.38	<1.8 R	<0.38	<0.77	<0.38	<0.38	<0.38	<0.38	<0.77	<0.77	<0.77	<0.38	<0.77	<0.77	<0.38	<0.38	<0.38	<0.38	<0.77	<1.0	<0.054
DG-AB9	1	0.5-1	DG-AB9S-0.5-1	1/30/2019	<0.48	<4.8	<0.95	<0.95	<4.8	<0.48	<2.4	<0.48	<0.95	<0.48	<0.48	<0.48	<0.48	<0.95	<0.95	<0.95	<0.48	<0.95	<0.95	<0.48	<0.48	<0.48	<0.48	<0.95	<1.2	<0.067
DG-AB9	1	3.5-4	DG-AB9S-3.5-4	1/30/2019	<0.43	<4.3	<0.85	<0.85	<4.3	<0.43	<2.1	<0.43	<0.85	<0.43	<0.43	<0.43	<0.43	<0.85	<0.85	<0.85	<0.43	<0.85	<0.85	<0.43	<0.43	<0.43	<0.43	<0.85	<1.1	<0.060
DG-AC3	1	0.5-1	DG-AC3S-0.5-1	12/19/2018	<0.39	<3.9	<0.77	<0.77	<3.9	<0.39	<1.9	<0.39	<0.77	<0.39	<0.39	<0.39	<0.39	<0.77	<0.77	<0.77	<0.39	<0.77	<0.77	<0.39	<0.39	<0.39	<0.39	<0.77	<1.0	<0.054
DG-AC3	1	3.5-4	DG-AC3S-3.5-4	12/19/2018	<0.31	<3.1	<0.62	<0.62	<3.1	<0.31	<1.6	<0.31	<0.62	<0.31	<0.31	<0.31	<0.31	<0.62	<0.62	<0.62	<0.31	<0.62	<0.62	<0.31	<0.31	<0.31	<0.31	<0.62	<0.81	<0.044
DG-AC7	1	0.5-1	DG-AC7S-0.5-1	1/9/2019	<0.38	<3.8	<0.77	<0.77	<3.8	<0.38	<1.9	<0.38	<0.77	<0.38	<0.38	<0.38	<0.38	<0.77	<0.77	<0.77	<0.38	<0.77	<0.77	<0.38	<0.38	<0.38	<0.38	<0.77	<1.0	<0.054
DG-AC7 (D)	1	0.5-1	DG-AC7 (D)S-0.5-1	1/9/2019	<0.34	<3.4	<0.67	<0.67	<3.4	<0.34	<1.7	<0.34	<0.67	<0.34	<0.34	<0.34	<0.34	<0.67	<0.67	<0.67	<0.34	<0.67	<0.67	<0.34	<0.34	<0.34	<0.34	<0.67	<0.87	<0.047
DG-AC7	1	3.5-4	DG-AC7S-3.5-4	1/9/2019	<0.47	<4.7	<0.94	<0.94	<4.7	<0.47	<2.3	<0.47	<0.94	<0.47	<0.47	<0.47	<0.47	<0.94	<0.94	<0.94	<0.47	<0.94	<0.94	<0.47	<0.47	<0.47	<0.47	<0.94	<1.2	<0.066
DG-AC7	1	7.5-8	DG-AC7S-7.5-8	1/9/2019	<0.39	<3.9	<0.78	<0.78	<3.9	<0.39	<1.9	<0.39	<0.78	<0.39	<0.39	<0.39	<0.39	<0.78	<0.78	<0.78	<0.39	<0.78	<0.78	<0.39	<0.39	<0.39	<0.39	<0.78	<1.0	<0.054
DG-AD5	1	0.5-1	DG-AD5S-0.5-1	1/8/2019	<0.35	<3.5	<0.71	<0.71	<3.5	<0.35	<1.8	<0.35	<0.71	<0.35	<0.35	<0.35	<0.35	<0.71	<0.71	<0.71	<0.35	<0.71	<0.71	<0.35	<0.35	<0.35	<0.35	<0.71	<0.92	<0.050
DG-AD5	1	3.5-4	DG-AD5S-3.5-4	1/8/2019	<0.40	<4.0	<0.80	<0.80	**10**	<0.40	<2.0	<0.40	<0.80	<0.40	<0.40	<0.40	<0.40	<0.80	<0.80	<0.80	<0.40	<0.80	<0.80	<0.40	<0.40	<0.40	<0.40	<0.80	<1.0	<0.056
DG-AD9	1	0.5-1	DG-AD9S-0.5-1	1/9/2019	<0.31	<3.1	<0.63	<0.63	<3.1	<0.31	<1.6	<0.31	<0.63	<0.31	<0.31	<0.31	<0.31	<0.63	<0.63	<0.63	<0.31	<0.63	<0.63	<0.31	<0.31	<0.31	<0.31	<0.63	<0.82	<0.044
DG-AD9	1	3.5-4	DG-AD9S-3.5-4	1/9/2019	<0.33	<3.3	<0.67	<0.67	<3.3	<0.33	<1.7	<0.33	<0.67	<0.33	<0.33	<0.33	<0.33	<0.67	<0.67	<0.67	<0.33	<0.67	<0.67	<0.33	<0.33	<0.33	<0.33	<0.67	<0.87	<0.047
DG-AE3	1	0.5-1	DG-AE3S-0.5-1	12/19/2018	<0.45	<4.5	<0.90	<0.90	<4.5	<0.45	<2.2	<0.45	**1.1 J**	<0.45	<0.45	<0.45	<0.45	<0.90	<0.90	<0.90	<0.45	<0.90	<0.90	<0.45	<0.45	<0.45	<0.45	<0.90	<1.2	<0.063
DG-AE3	1	3.5-4	DG-AE3S-3.5-4	12/19/2018	<0.34	<3.4	<0.68	<0.68	<3.4	<0.34	<1.7	<0.34	<0.68	<0.34	<0.34	<0.34	<0.34	<0.68	<0.68	<0.68	<0.34	<0.68	<0.68	<0.34	<0.34	<0.34	<0.34	<0.68	<0.89	<0.048
DG-AE7	1	0.5-1	DG-AE7S-0.5-1	1/9/2019	<0.33	<3.3	<0.66	<0.66	<3.3	<0.33	<1.6	<0.33	<0.66	<0.33	<0.33	<0.33	<0.33	<0.66	<0.66	<0.66	<0.33	<0.66	<0.66	<0.33	<0.33	<0.33	<0.33	<0.66	<0.86	<0.046
DG-AE7	1	3.5-4	DG-AE7S-3.5-4	1/9/2019	<0.37	<3.7	<0.74	<0.74	**18**	<0.37	<1.8	<0.37	<0.74	<0.37	<0.37	<0.37	<0.37	<0.74	<0.74	<0.74	<0.37	<0.74	<0.74	<0.37	<0.37	<0.37	<0.37	<0.74	<0.96	<0.052
DG-AE7	1	8-8.5	DG-AE7S-8-8.5	1/9/2019	<0.38	<3.8	<0.76	<0.76	<3.8	<0.38	<1.9	<0.38	<0.76	<0.38	<0.38	<0.38	<0.38	<0.76	<0.76	<0.76	<0.38	<0.76	<0.76	<0.38	<0.38	<0.38	<0.38	<0.76	<0.99	<0.054
DG-AF5	1	0.5-1	DG-AF5S-0.5-1	1/8/2019	<0.36	<3.6	<0.73	<0.73	<3.6	<0.36	<1.8	<0.36	<0.73	<0.36	<0.36	<0.36	<0.36	<0.73	<0.73	<0.73	<0.36	<0.73	<0.73	<0.36	<0.36	<0.36	<0.36	<0.73	<0.95	<0.051
DG-AF5	1	3.5-4	DG-AF5S-3.5-4	1/8/2019	<0.49	<4.9	<0.98	<0.98	<4.9	<0.49	<2.5	<0.49	<0.98	<0.49	<0.49	<0.49	<0.49	<0.98	<0.98	<0.98	<0.49	<0.98	<0.98	<0.49	<0.49	<0.49	<0.49	<0.98	<1.3	<0.069
DG-AG3	1	0.5-1	DG-AG3S-0.5-1	12/19/2018	<0.48	<4.8	<0.97	<0.97	<4.8	<0.48	<2.4	<0.48	<0.97	<0.48	<0.48	<0.48	<0.48	<0.97	<0.97	<0.97	<0.48	<0.97	<0.97	<0.48	<0.48	<0.48	<0.48	<0.97	<1.3	<0.068
DG-AG3	1	3.5-4	DG-AG3S-3.5-4	12/19/2018	<0.37	<3.7	<0.74	<0.74	<3.7	<0.37	<1.8	<0.37	<0.74	<0.37	<0.37	<0.37	<0.37	<0.74	<0.74	<0.74	<0.37	<0.74	<0.74	<0.37	<0.37	<0.37	<0.37	<0.74	<0.96	<0.052
DG-AG3	1	3.5-4	DG-AG3S-3.5-4	2/4/2019	<0.32	<3.2	<0.64	<0.64	<3.2	<0.32	<1.6	<0.32	<0.64	<0.32	<0.32	<0.32	<0.32	<0.64	<0.64	<0.64	<0.32	<0.64	<0.64	<0.32	<0.32	<0.32	<0.32	<0.64	<0.84	<0.045
DG-AG7	1	0.5-1	DG-AG7S-0.5-1	1/30/2019	<0.34	<3.4	<0.69	<0.69	<3.4	<0.34	<1.7	<0.34	<0.69	<0.34	<0.34	<0.34	<0.34	<0.69	<0.69	<0.69	<0.34	<0.69	<0.69	<0.34	<0.34	<0.34	<0.34	<0.69	<0.89	<0.048
DG-AG7	1	3.5-4	DG-AG7S-3.5-4	1/30/2019	<0.97	<9.7	<1.9	<1.9	<9.7	<0.97	<4.9	<0.97	<1.9	<0.97	<0.97	<0.97	<0.97	<1.9	<1.9	<1.9	<0.97	<1.9	<1.9	<0.97	**1.3 J**	<0.97	<0.97	<1.9	<2.5	<0.14
DG-AH4	1	4-4.5	DG-AH4S-4-4.5	12/18/2018	<48	<190	**1,100**	**320**	<480	**500**	<190	<48	<120	<48	<48	**75 J**	**2,300**	<96	**570**	**680**	**340**	**650**	**1,100**	<48	<48	<48	<48	<96	**340**	**250**
DG-AH5	1	0.5-1	DG-AH5S-0.5-1	1/8/2019	<0.34	<3.4	<0.67	<0.67	<3.4	<0.34	<1.7	<0.34	<0.67	<0.34	<0.34	<0.34	<0.34	<0.67	<0.67	<0.67	<0.34	<0.67	<0.67	<0.34	<0.34	<0.34	<0.34	<0.67	<0.87	<0.047
DG-AH5	1	3.5-4	DG-AH5S-3.5-4	1/8/2019	<0.32	<3.2	<0.63	<0.63	<3.2	<0.32	<1.6	<0.32	<0.63	<0.32	<0.32	<0.32	<0.32	<0.63	<0.63	<0.63	<0.32	<0.63	<0.63	<0.32	<0.32	<0.32	<0.32	<0.63	<0.82	<0.044
DG-AH5	1	8-8.5	DG-AH5S-8-8.5	1/8/2019	<0.36	<3.6	<0.71	<0.71	<3.6	<0.36	<1.8	<0.36	<0.71	<0.36	<0.36	<0.36	<0.36	<0.71	<0.71	<0.71	<0.36	<0.71	<0.71	<0.36	<0.36	<0.36	<0.36	<0.71	<0.93	<0.050
DG-AH9	2	0.5-1	DG-AH9S-0.5-1	1/30/2019	<0.40	<4.0	<0.79	<0.79	<4.0	<0.40	<2.0	<0.40	<0.79	<0.40	<0.40	<0.40	<0.40	<0.79	<0.79	<0.79	<0.40	<0.79	<0.79	<0.40	<0.40	<0.40	<0.40	<0.79	<1.0	<0.055
DG-AH9	2	3.5-4	DG-AH9S-3.5-4	1/30/2019	<0.41	<4.1	<0.82	<0.82	**18**	<0.41	<2.0	<0.41	<0.82	<0.41	<0.41	<0.41	<0.41	<0.82	<0.82	<0.82	<0.41	<0.82	<0.82	<0.41	<0.41	<0.41	<0.41	<0.82	<1.1	<0.057
DG-AI3	2	0.5-1	DG-AI3S-0.5-1	12/19/2018	<0.47	<4.7	<0.95	<0.95	<4.7	<0.47	<2.4	<0.47	<0.95	<0.47	<0.47	<0.47	<0.47	<0.95	<0.95	<0.95	<0.47	<0.95	<0.95	<0.47	<0.47	<0.47	<0.47	<0.95	<1.2	<0.066

Table 5: Volatile Organic Compounds and Total Petroleum Hydrocarbons as Gasoline
Concentrations in Soil
Brisbane Baylands OU-2
Brisbane, California

Sample Location	Investigation Zone	Depth Range (ft bgs)	Sample Name	Collection Date	1,1,1-Trichloroethane	1,1,2-Trichloro-1,2,2-trifluoroethane	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	2-Butanone	4-Isopropyltoluene	4-Methyl-2-pentanone	Benzene	Carbon disulfide	Chloroform	cis-1,2-Dichloroethene	Ethylbenzene	Isopropylbenzene	Methyl-tert-butyl ether (MTBE)	Naphthalene	n-Butylbenzene	n-Propylbenzene	sec-Butylbenzene	tert-Butylbenzene	Tetrachloroethene (PCE)	Toluene	trans-1,2-Dichloroethene	Trichloroethene (TCE)	Vinyl Chloride	Xylenes, Total	TPH-Gasoline (C4-C12)
Direct Exposure Human Health Risk Level Residential Soil Exposure ESL [1]					1.7E+06	--	--	--	--	--	--	3.3E+02	--	3.2E+02	1.9E+04	5.9E+03	--	4.7E+04	3.8E+03	--	--	--	--	5.9E+02	1.1E+06	1.3E+05	9.5E+02	8.3E+00	5.8E+05	4.3E+05
Leaching to Groundwater Levels Non-drinking Water ESL [2]					7.0E+03	--	--	--	--	--	--	2.5E+01	--	2.3E+01	1.6E+03	4.3E+02	--	2.5E+03	1.2E+03	--	--	--	--	8.0E+01	1.0E+04	1.4E+04	8.5E+01	1.5E+00	1.0E+04	4.9E+03
USEPA RSL for Resident Soil [3]					8.1E+06	6.7E+06	3.0E+05	2.7E+05	2.7E+07	--	3.3E+07	1.2E+03	7.7E+05	3.2E+02	1.6E+05	5.8E+03	1.9E+06	4.7E+04	3.8E+03	3.9E+06	3.8E+06	7.8E+06	7.8E+06	2.4E+04	4.9E+06	1.6E+06	9.4E+02	5.9E+01	5.8E+05	--
Units					µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	mg/kg
DG-AI3	2	3.5-4	DG-AI3S-3.5-4	12/19/2018	<0.37	<3.7	<0.75	<0.75	<3.7	<0.37	<1.9	<0.37	<0.75	<0.37	<0.37	<0.37	<0.37	<0.75	<0.75	<0.75	<0.37	<0.75	<0.75	<0.37	<0.37	<0.37	**0.40 J**	<0.75	<0.97	<0.052
DG-AI3 (D)	2	3.5-4	DG-AI3 (D)S-3.5-4	12/19/2018	<0.40	<4.0	<0.81	<0.81	<4.0	<0.40	<2.0	<0.40	<0.81	<0.40	<0.40	<0.40	<0.40	<0.81	<0.81	<0.81	<0.40	<0.81	<0.81	<0.40	<0.40	<0.40	**1.4 J**	<0.81	<1.0	**0.13 J**
DG-AI7	2	0.5-1	DG-AI7S-0.5-1	1/9/2019	<0.38	<3.8	<0.76	<0.76	<3.8	<0.38	<1.9	**0.72**	<0.76	<0.38	<0.38	<0.38	<0.38	<0.76	<0.76	<0.76	<0.38	<0.76	<0.76	<0.38	**0.65**	<0.38	<0.38	<0.76	<0.98	<0.053
DG-AI7	2	3.5-4	DG-AI7S-3.5-4	1/9/2019	<0.35	<3.5	<0.69	<0.69	<3.5	<0.35	<1.7	<0.35	<0.69	<0.35	<0.35	<0.35	<0.35	<0.69	<0.69	<0.69	<0.35	<0.69	<0.69	<0.35	<0.35	<0.35	<0.35	<0.69	<0.90	<0.048
DG-AI7	2	8-8.5	DG-AI7S-8-8.5	1/9/2019	<0.50	<5.0	<0.99	<0.99	<5.0	<0.50	<2.5	<0.50	<0.99	<0.50	<0.50	<0.50	<0.50	<0.99	<0.99	<0.99	<0.50	<0.99	<0.99	<0.50	<0.50	<0.50	<0.50	<0.99	<1.3	<0.070
DG-AJ5	2	0.5-1	DG-AJ5S-0.5-1	1/8/2019	<0.37	<3.7	<0.75	<0.75	<3.7	<0.37	<1.9	<0.37	<0.75	<0.37	<0.37	<0.37	<0.37	<0.75	<0.75	<0.75	<0.37	<0.75	<0.75	<0.37	<0.37	<0.37	<0.37	<0.75	<0.97	<0.052
DG-AJ5	2	3.5-4	DG-AJ5S-3.5-4	1/8/2019	<0.33	<3.3	<0.66	<0.66	**8.6**	<0.33	<1.7	<0.33	<0.66	<0.33	<0.33	<0.33	<0.33	<0.66	<0.66	<0.66	<0.33	<0.66	<0.66	<0.33	<0.33	<0.33	<0.33	<0.66	<0.86	<0.046
DG-AJ9	2	0.5-1	DG-AJ9S-0.5-1	1/30/2019	<0.39	<3.9	<0.79	<0.79	<3.9	<0.39	<2.0	<0.39	<0.79	<0.39	<0.39	<0.39	<0.39	<0.79	<0.79	<0.79	<0.39	<0.79	<0.79	<0.39	<0.39	<0.39	<0.39	<0.79	<1.0	<0.055
DG-AJ9	2	3.5-4	DG-AJ9S-3.5-4	1/30/2019	<0.40	<4.0	<0.80	<0.80	**12**	<0.40	<2.0	<0.40	<0.80	<0.40	<0.40	<0.40	<0.40	<0.80	<0.80	<0.80	<0.40	<0.80	<0.80	<0.40	<0.40	<0.40	<0.40	<0.80	<1.0	<0.056
DG-AK3	2	0.5-1	DG-AK3S-0.5-1	12/19/2018	<0.32	<3.2	<0.65	<0.65	<3.2	<0.32	<1.6	<0.32	<0.65	<0.32	<0.32	<0.32	<0.32	<0.65	<0.65	<0.65	<0.32	<0.65	<0.65	<0.32	<0.32	<0.32	<0.32	<0.65	<0.84	<0.045
DG-AK3	2	3.5-4	DG-AK3S-3.5-4	12/19/2018	<0.42	<4.2	<0.83	<0.83	<4.2	<0.42	<2.1	<0.42	<0.83	<0.42	<0.42	<0.42	<0.42	<0.83	<0.83	<0.83	<0.42	<0.83	<0.83	<0.42	<0.42	<0.42	<0.42	<0.83	<1.1	<0.058
DG-AK7	2	0.5-1	DG-AK7S-0.5-1	1/9/2019	<0.38	<3.8	<0.77	<0.77	<3.8	<0.38	<1.9	<0.38	<0.77	<0.38	<0.38	<0.38	<0.38	<0.77	<0.77	<0.77	<0.38	<0.77	<0.77	<0.38	<0.38	<0.38	<0.38	<0.77	<1.0	<0.054
DG-AK7	2	3.5-4	DG-AK7S-3.5-4	1/9/2019	<0.49	<4.9	<0.97	<0.97	**20**	<0.49	<2.4	<0.49	<0.97	<0.49	<0.49	<0.49	<0.49	<0.97	<0.97	<0.97	<0.49	<0.97	<0.97	<0.49	<0.49	<0.49	<0.49	<0.97	<1.3	<0.068
DG-AK7 (D)	2	3.5-4	DG-AK7 (D)S-3.5-4	1/9/2019	<0.44	<4.4	<0.88	<0.88	**22**	<0.44	<2.2	<0.44	<0.88	<0.44	<0.44	<0.44	<0.44	<0.88	<0.88	<0.88	<0.44	<0.88	<0.88	<0.44	<0.44	<0.44	<0.44	<0.88	<1.1	<0.062
DG-AL5	2	0.5-1	DG-AL5S-0.5-1	1/30/2019	<0.39	<3.9	<0.78	<0.78	<3.9	<0.39	<2.0	<0.39	<0.78	<0.39	<0.39	<0.39	<0.39	<0.78	<0.78	<0.78	<0.39	<0.78	<0.78	<0.39	<0.39	<0.39	<0.39	<0.78	<1.0	<0.055
DG-AL5	2	3.5-4	DG-AL5S-3.5-4	1/30/2019	<0.33	<3.3	<0.65	<0.65	<3.3	<0.33	<1.6	<0.33	<0.65	<0.33	<0.33	<0.33	<0.33	<0.65	<0.65	<0.65	<0.33	<0.65	<0.65	<0.33	<0.33 UJ	<0.33	<0.33	<0.65	<0.85	<0.046
DG-AL5 (D)	2	3.5-4	DG-AL5 (D)S-3.5-4	1/30/2019	<0.30	<3.0	<0.59	<0.59	**5.4 J**	<0.30	<1.5	<0.30	<0.59	<0.30	<0.30	<0.30	<0.30	<0.59	<0.59	<0.59	<0.30	<0.59	<0.59	<0.30	**0.71 J**	<0.30	<0.30	<0.59	<0.77	<0.041
DG-AL9	2	0.5-1	DG-AL9S-0.5-1	1/21/2019	<0.42	<4.2	<0.84	<0.84	<4.2	<0.42	<2.1	<0.42	<0.84	<0.42	<0.42	<0.42	<0.42	<0.84	<0.84	<0.84 F2	<0.42	<0.84	<0.84	<0.42	<0.42	<0.42	<0.42	<0.84	<1.1	<0.059
DG-AL9	2	3.5-4	DG-AL9S-3.5-4	1/21/2019	<0.34	<3.4	<0.68	<0.68	<3.4	<0.34	<1.7	<0.34	<0.68	<0.34	<0.34	<0.34	<0.34	<0.68	<0.68	<0.68	<0.34	<0.68	<0.68	<0.34	<0.34	<0.34	<0.34	<0.68	<0.89	<0.048
DG-AL9	2	7-7.5	DG-AL9S-7-7.5	1/21/2019	<0.32	<3.2	<0.64	<0.64	<3.2	<0.32	<1.6	<0.32	<0.64	<0.32	<0.32	<0.32	<0.32	<0.64	<0.64	<0.64	<0.32	<0.64	<0.64	<0.32	<0.32	<0.32	<0.32	<0.64	<0.83	<0.045
DG-AL9 (D)	2	7-7.5	DG-AL9 (D)S-7-7.5	1/21/2019	<0.27	<2.7	<0.54	<0.54	<2.7	<0.27	<1.3	<0.27	<0.54	<0.27	<0.27	<0.27	<0.27	<0.54	<0.54	<0.54	<0.27	<0.54	<0.54	<0.27	<0.27	<0.27	<0.27	<0.54	<0.70	<0.038
DG-AM3	2	0.5-1	DG-AM3S-0.5-1	12/19/2018	<0.41	<4.1	<0.82	<0.82	<4.1	<0.41	<2.1	<0.41	<0.82	<0.41	<0.41	<0.41	<0.41	<0.82	<0.82	<0.82	<0.41	<0.82	<0.82	<0.41	<0.41	<0.41	<0.41	<0.82	<1.1	<0.057
DG-AM3	2	3.5-4	DG-AM3S-3.5-4	12/19/2018	<0.34	<3.4	<0.68	<0.68	<3.4	<0.34	<1.7	<0.34	<0.68	<0.34	<0.34	<0.34	<0.34	**0.82 J**	<0.68	<0.68	<0.34	<0.68	<0.68	<0.34	**0.37 J**	<0.34	<0.34	<0.68	<0.88	**0.058 J**
DG-AM7	2	0.5-1	DG-AM7S-0.5-1	1/9/2019	<0.32	<3.2	<0.63	<0.63	<3.2	<0.32	<1.6	<0.32	<0.63	<0.32	<0.32	<0.32	<0.32	<0.63	<0.63	<0.63	<0.32	<0.63	<0.63	<0.32	<0.32	<0.32	<0.32	<0.63	<0.82	<0.044
DG-AM7	2	3.5-4	DG-AM7S-3.5-4	1/9/2019	<0.46	<4.6	<0.92	<0.92	<4.6	<0.46	<2.3	<0.46	<0.92	<0.46	<0.46	<0.46	<0.46	<0.92	<0.92	<0.92	<0.46	<0.92	<0.92	<0.46	<0.46	<0.46	<0.46	<0.92	<1.2	<0.064
DG-AM7	2	7.5-8	DG-AM7S-7.5-8	1/9/2019	<0.42	<4.2	<0.84	<0.84	<4.2	<0.42	<2.1	<0.42	<0.84	<0.42	<0.42	<0.42	<0.42	<0.84	<0.84	<0.84	<0.42	<0.84	<0.84	<0.42	<0.42	<0.42	<0.42	<0.84	<1.1	<0.059
DG-AN5	2	0.5-1	DG-AN5S-0.5-1	12/20/2018	<0.35	<3.5	<0.70	<0.70	<3.5	<0.35	<1.8	<0.35	<0.70	<0.35	<0.35	<0.35	<0.35	<0.70	<0.70	<0.70	<0.35	<0.70	<0.70	<0.35	<0.35	<0.35	<0.35	<0.70	<0.92	<0.049
DG-AN5	2	0.5-1	DG-AN5S-0.5-1	2/1/2019	<0.51	<5.1	<1.0	<1.0	<5.1	<0.51	<2.6	<0.51	<1.0	<0.51	<0.51	<0.51	<0.51	<1.0	<1.0	<1.0	<0.51	<1.0	<1.0	<0.51	<0.51	<0.51	<0.51	<1.0	<1.3	<0.072
DG-AN5	2	3.5-4	DG-AN5S-3.5-4	12/20/2018	<0.32	<3.2	<0.65	<0.65	<3.2	<0.32	<1.6	<0.32	<0.65	<0.32	<0.32	<0.32	<0.32	<0.65	<0.65	<0.65	<0.32	<0.65	<0.65	<0.32	<0.32	<0.32	<0.32	<0.65	<0.84	<0.045
DG-AN5	2	3.5-4	DG-AN5S-3.5-4	2/1/2019	<0.35	<3.5	<0.70	<0.70	<3.5	<0.35	<1.8	<0.35	<0.70	<0.35	<0.35	<0.35	<0.35	<0.70	<0.70	<0.70	<0.35	<0.70	<0.70	<0.35	<0.35	<0.35	<0.35	<0.70	<0.91	<0.049
DG-AN9	2	0.5-1	DG-AN9S-0.5-1	1/21/2019	<0.34	<3.4	<0.67	<0.67	<3.4	<0.34	<1.7	<0.34	<0.67	<0.34	<0.34	<0.34	<0.34	<0.67	<0.67	<0.67	<0.34	<0.67	<0.67	<0.34	<0.34	<0.34	<0.34	<0.67	<0.88	<0.047
DG-AN9	2	3.5-4	DG-AN9S-3.5-4	1/21/2019	<0.40	<4.0	<0.79	<0.79	<4.0	<0.40	<2.0	**0.79**	<0.79	<0.40	<0.40	<0.40	<0.40	<0.79	<0.79	<0.79	<0.40	<0.79	<0.79	<0.40	<0.40	<0.40	<0.40	<0.79	<1.0	<0.055
DG-AN9	2	7-7.5	DG-AN9S-7-7.5	1/21/2019	<0.35	<3.5	<0.70	<0.70	<3.5	<0.35	<1.8	<0.35	<0.70	<0.35	<0.35	<0.35	<0.35	<0.70	<0.70	<0.70	<0.35	<0.70	<0.70	<0.35	<0.35	<0.35	<0.35 *	<0.70	<0.91	<0.049
DG-AO3	2	0.5-1	DG-AO3S-0.5-1	12/19/2018	<0.37	<3.7	<0.74	<0.74	<3.7	<0.37	<1.9	<0.37	<0.74	<0.37	<0.37	<0.37	<0.37	<0.74	<0.74	<0.74	<0.37	<0.74	<0.74	<0.37	<0.37	<0.37	<0.37	<0.74	<0.96	<0.052
DG-AO3	2	3.5-4	DG-AO3S-3.5-4	12/19/2018	<0.41	<4.1	<0.83	<0.83	<4.1	<0.41	<2.1	<0.41	<0.83	<0.41	<0.41	<0.41	<0.41	**1.2 J**	<0.67	<0.83	<0.41	<0.83	<0.83	<0.41	<0.41	<0.41	<0.41	<0.83	<1.1	<0.058
DG-AO7	2	0.5-1	DG-AO7S-0.5-1	1/9/2019	<0.32	<3.2	<0.64	<0.64	<3.2	<0.32	<1.6	<0.32	<0.64	<0.32	<0.32	<0.32	<0.32	<0.64	<0.64	<0.64	<0.32	<0.64	<0.64	<0.32	<0.32	<0.32	<0.32	<0.64	<0.84	<0.045
DG-AO7	2	3.5-4	DG-AO7S-3.5-4	1/9/2019	<0.40	<4.0	<0.80	<0.80	<4.0	<0.40	<2.0	<0.40	<0.80	<0.40	<0.40	<0.40	<0.40	<0.80	<0.80	<0.80	<0.40	<0.80	<0.80	<0.40	<0.40	<0.40	<0.40	<0.80	<1.0	<0.056
DG-AP5	2	0.5-1	DG-AP5S-0.5-1	12/20/2018	<0.46	<4.6	<0.92	<0.92	<4.6	<0.46	<2.3	<0.46	<0.92	<0.46	<0.46	<0.46	<0.46	<0.92	<0.92	<0.92	<0.46	<0.92	<0.92	<0.46	<0.46	<0.46	<0.46	<0.92	<1.2	<0.064
DG-AP5	2	3.5-4	DG-AP5S-3.5-4	12/20/2018	<0.42	<4.2	<0.84	<0.84	<4.2	<0.42	<2.1	<0.42	<0.84	<0.42	<0.42	<0.42	<0.42	<0.84	<0.84	<0.84	<0.42	<0.84	<0.84	<0.42	<0.42	<0.42	<0.42	<0.84	<1.1	<0.059
DG-AP5	2	3.5-4	DG-AP5S-3.5-4	2/1/2019	<0.35	<3.5	<0.71	<0.71	<3.5	<0.35	<1.8	<0.35	<0.71	<0.35	<0.35	<0.35	<0.35	<0.71	<0.71	<0.71	<0.35	<0.71	<0.71	<0.35	<0.35	<0.35	<0.35	<0.71	<0.92	<0.049
DG-AP9	2	0.5-1	DG-AP9S-0.5-1	1/21/2019	<0.34	<3.4	<0.69	<0.69	<3.4	<0.34	<1.7	<0.34	<0.69	<0.34	<0.34	<0.34	<0.34	<0.69	<0.69	<0.69	<0.34	<0.69	<0.69	<0.34	<0.34	<0.34	<0.34	<0.69	<0.90	<0.048
DG-AP9	2	3.5-4	DG-AP9S-3.5-4	1/21/2019	<0.85	<8.5	<1.7	<1.7	<8.5	<0.85	<4.3	**3**	<1.7	<0.85	<0.85	<0.85	<0.85	<1.7	<1.7	<1.7	<0.85	<1.7	<1.7	<0.85	**1.8**	<0.85	<0.85	<1.7	<2.2	<0.12
DG-AQ3	2	0.5-1	DG-AQ3S-0.5-1	12/19/2018	<0.42	<4.2	<0.84	<0.84	<4.2	<0.42	<2.1	<0.42	<0.84	<0.42	<0.42	<0.42	<0.42	<0.84	<0.84	<0.84	<0.42	<0.84	<0.84	<0.42	<0.42	<0.42	<0.42	<0.84	<1.1	<0.059
DG-AQ3	2	3.5-4	DG-AQ3S-3.5-4	12/19/2018	<0.37	<3.7	<0.74	<0.74	<3.7	<0.37	<1.9	<0.37	<0.74	<0.37	<0.37	<0.37	<0.37	<0.74	<0.74	<0.74	<0.37	<0.74	<0.74	<0.37	<0.37	<0.37	<0.37	<0.74	<0.97	<0.052
DG-AQ7	2	0.5-1	DG-AQ7S-0.5-1	1/30/2019	<0.41	<4.1	<0.82	<0.82	<4.1	<0.41	<2.0	<0.41	<0.82	<0.41	<0.41	<0.41	<0.41	<0.82	<0.82	<0.82	<0.41	<0.82	<0.82	<0.41	<0.41	<0.41	<0.41	<0.82	<1.1	<0.057
DG-AQ7	2	3.5-4	DG-AQ7S-3.5-4	1/30/2019	<0.38	<3.8	<0.77	<0.77	<3.8	<0.38	<1.9	<0.38	<0.77	<0.38	<0.38	<0.38	<0.38	<0.77	<0.77	<0.77	<0.38	<0.77	<0.77	<0.38	<0.38	<0.38	<0.38	<0.77	<1.0	<0.054
DG-AR5	2	0.5-1	DG-AR5S-0.5-1	12/20/2018	<0.40	<4.0	<0.80	<0.80	<4.0	<0.40	<2.0	<0.40	<0.80	<0.40	<0.40	<0.40	<0.40	<0.80	<0.80	<0.80	<0.40	<0.80	<0.80	<0.40	<0.40	<0.40	<0.40	<0.80	<1.0	<0.056
DG-AR5	2	3.5-4	DG-AR5S-3.5-4	12/20/2018	<0.37	<3.7	<0.75	<0.75	<3.7	<0.37	<1.9	<0.37	<0.75	<0.37	<0.37	<0.37	<0.37	<0.75	<0.75	<0.75	<0.37	<0.75	<0.75	<0.37	<0.37	<0.37	<0.37	<0.75	<0.97	<0.052
DG-AR9	2	0.5-1	DG-AR9S-0.5-1	1/9/2019	<0.34	<3.4	<0.68	<0.68	<3.4	<0.34	<1.7	<0.34	<0.68	<0.34	<0.34	<0.34	<0.34	<0.68	<0.68	<0.68	<0.34	<0.68	<0.68	<0.34	<0.34	<0.34	<0.34	<0.68	<0.89	<0.048
DG-AR9	2	3.5-4	DG-AR9S-3.5-4	1/9/2019	<0.44	<4.4	<0.88	<0.88	<4.4	<0.44	<2.2	<0.44	<0.88	<0.44	<0.44	<0.44	<0.44	<0.88	<0.88	<0.88	<0.44	<0.88	<0.88	<0.44	<0.44	<0.44	<0.44	<0.88	<1.2	<0.062
DG-AR9 (D)	2	3.5-4	DG-AR9 (D)S-3.5-4	1/9/2019	<0.33	<3.3	<0.67	<0.67	<3.3	<0.33	<1.7	<0.33	<0.67	<0.33	<0.33	<0.33	<0.33	<0.67	<0.67	<0.67	<0.33	<0.67	<0.67	<0.33	<0.33	<0.33	<0.33	<0.67	<0.87	<0.047
DG-AS3	2	0.5-1	DG-AS3S-0.5-1	12/20/2018	<0.45	<4.5	<0.90	<0.90	<4.5	<0.45	<2.3	<0.45	<0.90	<0.45	<0.45	<0.45	<0.45	<0.90	<0.90	<0.90	<0.45	<0.90	<0.90	<0.45	<0.45	<0.45	<0.45	<0.90	<1.2	<0.063
DG-AS3 (D)	2	0.5-1	DG-AS3 (D)S-0.5-1	12/20/2018	<0.39	<3.9	<0.78	<0.78	<3.9	<0.39	<2.0	<0.39	<0.78	<0.39	<0.39	<0.39	<0.39	<0.78	<0.78	<0.78	<0.39	<0.78	<0.78	<0.39	<0.39	<0.39	<0.39	<0.78	<1.0	<0.055
DG-AS3	2	3.5-4	DG-AS3S-3.5-4	12/20/2018	<0.29	<2.9	<0.59	<0.59	<2.9	<0.29	<1.5	<0.29	<0.59	<0.29	<0.29	<0.29	<0.29	<0.59	<0.59	<0.59	<0.29	<0.59	<0.59	<0.29	<0.29	<0.29	<0.29	<0.59	<0.76	<0.041
DG-AS3	2	4.5-5	DG-AS3S-4.5-5	12/20/2018	<0.36	<3.6	<0.72	<0.72	<3.6	<0.36	<1.8	<0.36	<0.72	<0.36	<0.36	<0.36	<0.36	<0.72	<0.72	<0.72	<0.36	<0.72	<0.72	<0.36	<0.36	<0.36	<0.36	<0.72	<0.94	<0.050
DG-AS7	2	0.5-1	DG-AS7S-0.5-1	1/9/2019	<0.45	<4.5	<0.90	<0.90	<4.5	<0.45	<2.3	<0.45	<0.90	<0.45	<0.45	<0.45	<0.45	<0.90	<0.90	<0.90	<0.45	<0.90	<0.90	<0.45	<0.45	<0.45	<0.45	<0.90	<1.2	<0.063
DG-AS7	2	3.5-4	DG-AS7S-3.5-4	1/9/2019	<0.38	<3.8	<0.77	<0.77	<3.8	<0.38	<1.9	<0.38	<0.77	<0.38	<0.38	<0.38	<0.38	<0.77	<0.77	<0.77	<0.38	<0.77	<0.77	<0.38	<0.38	<0.38	<0.38	<0.77	<1.0	<0.054

Table 5: Volatile Organic Compounds and Total Petroleum Hydrocarbons as Gasoline
Concentrations in Soil
Brisbane Baylands OU-2
Brisbane, California

Sample Location	Investigation Zone	Depth Range (ft bgs)	Sample Name	Collection Date	1,1,1-Trichloroethane	1,1,2-Trichloro-1,2,2-trifluoroethane	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	2-Butanone	4-Isopropyltoluene	4-Methyl-2-pentanone	Benzene	Carbon disulfide	Chloroform	cis-1,2-Dichloroethene	Ethylbenzene	Isopropylbenzene	Methyl-tert-butyl ether (MTBE)	Naphthalene	n-Butylbenzene	n-Propylbenzene	sec-Butylbenzene	tert-Butylbenzene	Tetrachloroethene (PCE)	Toluene	trans-1,2-Dichloroethene	Trichloroethene (TCE)	Vinyl Chloride	Xylenes, Total	TPH-Gasoline (C4-C12)
Direct Exposure Human Health Risk Level Residential Soil Exposure ESL [1]					1.7E+06	--	--	--	--	--	--	3.3E+02	--	3.2E+02	1.9E+04	5.9E+03	--	4.7E+04	3.8E+03	--	--	--	--	5.9E+02	1.1E+06	1.3E+05	9.5E+02	8.3E+00	5.8E+05	4.3E+05
Leaching to Groundwater Levels Non-drinking Water ESL [2]					7.0E+03	--	--	--	--	--	--	2.5E+01	--	2.3E+01	1.6E+03	4.3E+02	--	2.5E+03	1.2E+03	--	--	--	--	8.0E+01	1.0E+04	1.4E+04	8.5E+01	1.5E+00	1.0E+04	4.9E+03
USEPA RSL for Resident Soil [3]					8.1E+06	6.7E+06	3.0E+05	2.7E+05	2.7E+07	--	3.3E+07	1.2E+03	7.7E+05	3.2E+02	1.6E+05	5.8E+03	1.9E+06	4.7E+04	3.8E+03	3.9E+06	3.8E+06	7.8E+06	7.8E+06	2.4E+04	4.9E+06	1.6E+06	9.4E+02	5.9E+01	5.8E+05	--
Units					µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	mg/kg
DG-AT5	2	0.5-1	DG-AT5S-0.5-1	12/20/2018	<0.45	<4.5	<0.91	<0.91	<4.5	<0.45	<2.3	<0.45	<0.91	<0.45	<0.45	<0.45	<0.45	<0.91	<0.91	<0.91	<0.45	<0.91	<0.91	<0.45	<0.45	<0.45	<0.45	<0.91	<1.2	<0.064
DG-AT5	2	0.5-1	DG-AT5S-0.5-1	2/4/2019	<0.37	<3.7	<0.75	<0.75	<3.7	<0.37	<1.9	<0.37	<0.75	<0.37	<0.37	<0.37	<0.37	<0.75	<0.75	<0.75	<0.37	<0.75	<0.75	<0.37	<0.37	<0.37	<0.37	<0.75	<0.97	<0.052
DG-AT5	2	3.5-4	DG-AT5S-3.5-4	12/20/2018	<0.44	<4.4	<0.88	<0.88	<4.4	<0.44	<2.2	<0.44	<0.88	<0.44	<0.44	<0.44	<0.44	<0.88	<0.88	<0.88	<0.44	<0.88	<0.88	<0.44	<0.44	<0.44	<0.44	<0.88	<1.1	<0.062
DG-AT5	2	3.5-4	DG-AT5S-3.5-4	2/4/2019	<0.33	<3.3	<0.66	<0.66	<3.3	<0.33	<1.7	<0.33	<0.66	<0.33	<0.33	<0.33	<0.33	<0.66	<0.66	<0.66	<0.33	<0.66	<0.66	<0.33	<0.33	<0.33	<0.33	<0.66	<0.86	<0.046
DG-AU3	2	0.5-1	DG-AU3S-0.5-1	12/20/2018	<0.43	<4.3	<0.85	<0.85	<4.3	<0.43	<2.1	<0.43	<0.85	<0.43	<0.43	<0.43	<0.43	<0.85	<0.85	<0.85	<0.43	<0.85	<0.85	<0.43	<0.43	<0.43	<0.43	<0.85	<1.1	<0.060
DG-AU3	2	3.5-4	DG-AU3S-3.5-4	12/20/2018	<0.51	<5.1	<1.0	<1.0	<5.1	<0.51	<2.6	<0.51	<1.0	<0.51	<0.51	<0.51	<0.51	<1.0	<1.0	<1.0	<0.51	<1.0	<1.0	<0.51	<0.51	<0.51	<0.51	<1.0	<1.3	<0.072
DG-AU7	2	0.5-1	DG-AU7S-0.5-1	1/9/2019	<0.43	<4.3	<0.87	<0.87	<4.3	<0.43	<2.2	<0.43	<0.87	<0.43	<0.43	<0.43	<0.43	<0.87	<0.87	<0.87	<0.43	<0.87	<0.87	<0.43	<0.43	<0.43	<0.43	<0.87	<1.1	<0.061
DG-AU7 (D)	2	0.5-1	DG-AU7 (D)S-0.5-1	1/9/2019	<0.40	<4.0	<0.80	<0.80	<4.0	<0.40	<2.0	<0.40	<0.80	<0.40	<0.40	<0.40	<0.40	<0.80	<0.80	<0.80	<0.40	<0.80	<0.80	<0.40	<0.40	<0.40	<0.40	<0.80	<1.0	<0.056
DG-AU7	2	3.5-4	DG-AU7S-3.5-4	1/9/2019	<0.41	<4.1	<0.83	<0.83	<4.1	<0.41	<2.1	<0.41	<0.83	<0.41	<0.41	<0.41	<0.41	<0.83	<0.83	<0.83	<0.41	<0.83	<0.83	<0.41	<0.41	<0.41	<0.41	<0.83	<1.1	<0.058
DG-AV5	2	0.5-1	DG-AV5S-0.5-1	12/20/2018	<0.42	<4.2	<0.83	<0.83	<4.2	<0.42	<2.1	<0.42	<0.83	<0.42	<0.42	<0.42	<0.42	<0.83	<0.83	<0.83	<0.42	<0.83	<0.83	<0.42	<0.42	<0.42	<0.42	<0.83	<1.1	<0.058
DG-AV5 (D)	2	0.5-1	DG-AV5 (D)S-0.5-1	12/20/2018	<0.46	<4.6	<0.91	<0.91	<4.6	<0.46	<2.3	<0.46	<0.91	<0.46	<0.46	<0.46	<0.46	<0.91	<0.91	<0.91	<0.46	<0.91	<0.91	<0.46	<0.46	<0.46	<0.46	<0.91	<1.2	<0.064
DG-AV5	2	0.5-1	DG-AV5S-0.5-1	2/1/2019	<0.38	<3.8	<0.76	<0.76	<3.8	<0.38	<1.9	<0.38	<0.76	<0.38	<0.38	<0.38	<0.38	<0.76	<0.76	<0.76	<0.38	<0.76	<0.76	<0.38	<0.38	<0.38	<0.38	<0.76	<0.98	<0.053
DG-AV5 (D)	2	0.5-1	DG-AV5 (D)S-0.5-1	2/1/2019	<0.37	<3.7	<0.74	<0.74	<3.7	<0.37	<1.8	<0.37	<0.74	<0.37	<0.37	<0.37	<0.37	<0.74	<0.74	<0.74	<0.37	<0.74	<0.74	<0.37	<0.37	<0.37	<0.37	<0.74	<0.96	<0.052
DG-AV5	2	3.5-4	DG-AV5S-3.5-4	12/20/2018	<0.40	<4.0	<0.80	<0.80	<4.0	<0.40	<2.0	<0.40	<0.80	<0.40	<0.40	<0.40	<0.40	<0.80	<0.80	<0.80	<0.40	<0.80	<0.80	<0.40	**0.7**	<0.40	<0.40	<0.80	<1.0	<0.051
DG-AV5	2	3.5-4	DG-AV5S-3.5-4	2/1/2019	<0.63	<6.3	<1.3	<1.3	<6.3	<0.63	<3.1	**0.71 J**	<1.3	<0.63	<0.63	<0.63	<0.63	<1.3	<1.3	<1.3	<0.63	<1.3	<1.3	<0.63	**1.3**	<0.63	<0.63	<1.3	<1.6	<0.088
DG-AV5	2	7.5-8	DG-AV5S-7.5-8	12/20/2018	<0.37	<3.7	<0.74	<0.74	<3.7	<0.37	<1.8	<0.37	<0.74	<0.37	<0.37	<0.37	<0.37	<0.74	<0.74	<0.74	<0.37	<0.74	<0.74	<0.37	<0.37	<0.37	<0.37	<0.74	<0.96	<0.052
DG-AV5	2	7.5-8	DG-AV5S-7.5-8	2/1/2019	<0.31	<3.1	<0.62	<0.62	<3.1	<0.31	<1.5	<0.31	<0.62	<0.31	<0.31	<0.31	<0.31	<0.62	<0.62	<0.62	<0.31	<0.62	<0.62	<0.31	<0.31	<0.31	<0.31	<0.62	<0.80	<0.043
DG-AW3	2	0.5-1	DG-AW3S-0.5-1	1/31/2019	<0.51	<5.1	<1.0	<1.0	<5.1	<0.51	<2.6	<0.51	<1.0	<0.51	<0.51	<0.51	<0.51	<1.0	<1.0	<1.0	<0.51	<1.0	<1.0	<0.51	<0.51	<0.51	<0.51	<1.0	<1.3	<0.072
DG-AW3	2	3.5-4	DG-AW3S-3.5-4	1/31/2019	<0.38	<3.8	<0.75	<0.75	<3.8	<0.38	<1.9	<0.38	<0.75	<0.38	<0.38	<0.38	<0.38	<0.75	<0.75	<0.75	<0.38	<0.75	<0.75	<0.38	<0.38	<0.38	<0.38	<0.75	<0.98	<0.053
DG-AX5	2	0.5-1	DG-AX5S-0.5-1	12/20/2018	<0.54	<5.4	<1.1	<1.1	<5.4	<0.54	<2.7	<0.54	<1.1	<0.54	<0.54	<0.54	<0.54	<1.1	<1.1	<1.1	<0.54	<1.1	<1.1	<0.54	<0.54	<0.54	<0.54	<1.1	<1.4	<0.076
DG-AX5	2	3.5-4	DG-AX5S-3.5-4	12/20/2018	<0.43	<4.3	<0.87	<0.87	<4.3	<0.43	<2.2	<0.43	<0.87	<0.43	<0.43	<0.43	<0.43	<0.87	**2.1**	<0.87	<0.43	<0.87	<0.87	<0.43	<0.43	<0.43	<0.43	<0.87	<1.1	<0.061
DG-AY3	2	0.5-1	DG-AY3S-0.5-1	1/31/2019	<0.44	<4.4	<0.88	<0.88	<4.4	<0.44	<2.2	<0.44	<0.88	<0.44	<0.44	<0.44	<0.44	<0.88	<0.88	<0.88	<0.44	<0.88	<0.88	<0.44	<0.44	<0.44	<0.44	<0.88	<1.1	<0.062
DG-AY3	2	3.5-4	DG-AY3S-3.5-4	1/31/2019	<0.36	<3.6	<0.72	<0.72	<3.6	<0.36	<1.8	<0.36	<0.72	<0.36	<0.36	<0.36	<0.36	<0.72	<0.72	<0.72	<0.36	<0.72	<0.72	<0.36	<0.36	<0.36	<0.36	<0.72	<0.94	<0.051
DG-N9	3	0.5-1	DG-N9S-0.5-1	1/10/2019	<0.38	<3.8	<0.76 UJ	<0.76 UJ	<3.8	<0.38 UJ	<1.9	<0.38	<0.76	<0.38	<0.38	<0.38	<0.38	<0.76	<0.76 UJ	<0.76 UJ	<0.38 UJ	<0.76 UJ	<0.76 UJ	<0.38	<0.38	<0.38	<0.38	<0.76	<0.99	<0.053
DG-N9	3	3.5-4	DG-N9S-3.5-4	1/10/2019	<0.35	<3.5	<0.71 UJ	<0.71 UJ	<3.5	<0.35 UJ	<1.8	<0.35	<0.71	<0.35	<0.35	<0.35	<0.35	<0.71	<0.71 UJ	<0.71 UJ	<0.35 UJ	<0.71 UJ	<0.71 UJ	<0.35	<0.35	<0.35	<0.35	<0.71	<0.92	<0.050
DG-N13	3	0.5-1	DG-N13S-0.5-1	1/10/2019	<0.38	<3.8	<0.76	<0.76	<3.8	<0.38	<1.9	<0.38	<0.76	<0.38	<0.38	<0.38	<0.38	<0.76	<0.76	<0.76	<0.38	<0.76	<0.76	<0.38	<0.38	<0.38	<0.38	<0.76	<0.99	<0.053
DG-N13 (D)	3	0.5-1	DG-N13 (D)S-0.5-1	1/10/2019	<0.62	<6.2	<1.2 UJ	<1.2 UJ	<6.2	<0.62 UJ	<3.1	<0.62	<1.2	<0.62	<0.62	<0.62	<0.62	<1.2	<1.2 UJ	<1.2 UJ	<0.62 UJ	<1.2 UJ	<1.2 UJ	<0.62	<0.62	<0.62	<0.62	<1.2	<1.6	<0.086
DG-N13	3	3.5-4	DG-N13S-3.5-4	1/10/2019	<0.65 F2	<6.5	<1.3	<1.3	<6.5	<0.65	<3.2	<0.65 F2	<1.3 F2	<0.65 F2	<0.65	<0.65	<0.65	<1.3	<1.3	<1.3	<0.65	<1.3	<1.3	<0.65	<0.65 F2	<0.65	<0.65	<1.3	<1.7	<0.091
DG-N13	3	7.5-8	DG-N13S-7.5-8	1/10/2019	<0.59	<5.9	<1.2	<1.2	<5.9	<0.59	<3.0	<0.59	<1.2	<0.59	<0.59	<0.59	<0.59	<1.2	<1.2	<1.2	<0.59	<1.2	<1.2	<0.59	<0.59	<0.59	<0.59	<1.2	<1.5	<0.083
DG-O7	3	0.5-1	DG-O7S-0.5-1	1/8/2019	<0.54	<5.4	<1.1	<1.1	<5.4	<0.54	<2.7	<0.54	<1.1	<0.54	<0.54	<0.54	<0.54	<1.1	<1.1	<1.1	<0.54	<1.1	<1.1	<0.54	<0.54	<0.54	<0.54	<1.1	<1.4	<0.075
DG-O7	3	3.5-4	DG-O7S-3.5-4	1/8/2019	<0.32	<3.2	<0.64	<0.64	<3.2	<0.32	<1.6	<0.32	<0.64	<0.32	<0.32	<0.32	<0.32	<0.64	<0.64	<0.64	<0.32	<0.64	<0.64	<0.32	<0.32	<0.32	<0.32	<0.64	<0.83	<0.045
DG-O11	3	0.5-1	DG-O11S-0.5-1	1/10/2019	<0.54	<5.4	<1.1	<1.1	<5.4	<0.54	<2.7	<0.54	<1.1	<0.54	<0.54	<0.54	<0.54	<1.1	<1.1	<1.1	<0.54	<1.1	<1.1	<0.54	<0.54	<0.54	<0.54	<1.1	<1.4	<0.075
DG-O11	3	3.5-4	DG-O11S-3.5-4	1/10/2019	<0.39	<3.9	<0.78	<0.78	<3.9	<0.39	<2.0	<0.39	<0.78	<0.39	<0.39	<0.39	<0.39	<0.78	<0.78	<0.78	<0.39	<0.78	<0.78	<0.39	<0.39	<0.39	<0.39	<0.78	<1.0	<0.055
DG-O15	3	0.5-1	DG-O15S-0.5-1	1/10/2019	<0.72	<7.2	<1.4 F2	<1.4 F2	<7.2	<0.72	<3.6	<0.72	<1.4	<0.72	<0.72	<0.72	<0.72	<1.4	<1.4	<1.4	<0.72 F2	<1.4	<1.4 F2	<0.72	<0.72 F2	<0.72	<0.72	<1.4	<1.9	<0.10
DG-O15	3	3.5-4	DG-O15S-3.5-4	1/10/2019	<0.33	<3.3	<0.66	<0.66	**10 J**	<0.33	<1.7	<0.33	<0.66	<0.33	<0.33	<0.33	<0.33	<0.66	<0.66	<0.66	<0.33	<0.66	<0.66	<0.33	<0.33	<0.33	<0.33	<0.66	<0.86	<0.046
DG-O15 (D)	3	3.5-4	DG-O15 (D)S-3.5-4	1/10/2019	<0.34	<3.4	<0.69	<0.69	<3.4 UJ	<0.34	<1.7	<0.34	<0.69	<0.34	<0.34	<0.34	<0.34	<0.69	<0.69	<0.69	<0.34	<0.69	<0.69	<0.34	<0.34	<0.34	<0.34	<0.69	<0.90	<0.048
DG-O15	3	7.5-8	DG-O15S-7.5-8	1/10/2019	<0.32	<3.2	<0.65	<0.65	<3.2	<0.32	<1.6	<0.32	<0.65	<0.32	<0.32	<0.32	<0.32	<0.65	<0.65	<0.65	<0.32	<0.65	<0.65	<0.32	<0.32	<0.32	<0.32	<0.65	<0.84	<0.045
DG-P9	3	0.5-1	DG-P9S-0.5-1	1/10/2019	<0.32	<3.2	<0.63	<0.63	<3.2	<0.32	<1.6	<0.32	<0.63	<0.32	<0.32	<0.32	<0.32	<0.63	<0.63	<0.63	<0.32	<0.63	<0.63	<0.32	<0.32	<0.32	<0.32	<0.63	<0.82	<0.044
DG-P9	3	3.5-4	DG-P9S-3.5-4	1/10/2019	<0.34	<3.4	<0.69	<0.69	<3.4	<0.34	<1.7	<0.34	<0.69	<0.34	<0.34	<0.34	<0.34	<0.69	<0.69	<0.69	<0.34	<0.69	<0.69	<0.34	<0.34	<0.34	<0.34	<0.69	<0.89	<0.048
DG-P13	3	0.5-1	DG-P13S-0.5-1	1/10/2019	<0.45	<4.5	<0.91	<0.91	<4.5	<0.45	<2.3	<0.45	<0.91	<0.45	<0.45	<0.45	<0.45	<0.91	<0.91	<0.91	<0.45	<0.91	<0.91	<0.45	<0.45	<0.45	<0.45	<0.91	<1.2	<0.064
DG-P13	3	3.5-4	DG-P13S-3.5-4	1/10/2019	<0.30	<3.0	<0.60	<0.60	<3.0	<0.30	<1.5	<0.30	<0.60	<0.30	<0.30	<0.30	<0.30	<0.60	<0.60	<0.60	<0.30	<0.60	<0.60	<0.30	<0.30	<0.30	<0.30	<0.60	<0.78	<0.042
DG-P13 (D)	3	3.5-4	DG-P13 (D)S-3.5-4	1/10/2019	<0.30	<3.0	<0.59	<0.59	<3.0	<0.30	<1.5	<0.30	<0.59	<0.30	<0.30	<0.30	<0.30	<0.59	<0.59	<0.59	<0.30	<0.59	<0.59	<0.30	<0.30	<0.30	<0.30	<0.59	<0.77	<0.042
DG-Q11	3	0.5-1	DG-Q11S-0.5-1	1/10/2019	<0.39	<3.9	<0.79	<0.79	<3.9	<0.39	<2.0	<0.39	<0.79	<0.39	<0.39	<0.39	<0.39	<0.79	<0.79	<0.79	<0.39	<0.79	<0.79	<0.39	<0.39	<0.39	<0.39	<0.79	<1.0	<0.055
DG-Q11 (D)	3	0.5-1	DG-Q11 (D)S-0.5-1	1/10/2019	<0.38	<3.8	<0.77	<0.77	<3.8	<0.38	<1.9	<0.38	<0.77	<0.38	<0.38	<0.38	<0.38	<0.77	<0.77	<0.77	<0.38	<0.77	<0.77	<0.38	<0.38	<0.38	<0.38	<0.77	<1.0	<0.054
DG-Q11	3	3.5-4	DG-Q11S-3.5-4	1/10/2019	<0.36	<3.6	<0.72	<0.72	<3.6	<0.36	<1.8	<0.36	<0.72	<0.36	<0.36	<0.36	<0.36	<0.72	<0.72	<0.72	<0.36	<0.72	<0.72	<0.36	<0.36	<0.36	<0.36	<0.72	<0.94	<0.050
DG-Q15	3	0.5-1	DG-Q15S-0.5-1	1/11/2019	<0.48	<4.8	<0.97	<0.97	<4.8	<0.48	<2.4	**0.54 J**	<0.97	<0.48	<0.48	<0.48	<0.48	<0.97	<0.97	<0.97	<0.48	<0.97	<0.97	<0.48	<0.48 UJ	<0.48	<0.48	<0.97	<1.3	<0.068
DG-Q15 (D)	3	0.5-1	DG-Q15 (D)S-0.5-1	1/11/2019	<0.48	<4.8	<0.97	<0.97	<4.8	<0.48	<2.4	**1.9 J**	<0.97	<0.48	<0.48	<0.48	<0.48	<0.97	<0.97	<0.97	<0.48	<0.97	<0.97	<0.48	**1.0 J**	<0.48	<0.48	<0.97	<1.3	<0.068
DG-Q15	3	3.5-4	DG-Q15S-3.5-4	1/11/2019	<0.35	<3.5	<0.70	<0.70	<3.5	<0.35	<1.7	<0.35	<0.70	<0.35	<0.35	<0.35	<0.35	<0.70	<0.70	<0.70	<0.35	<0.70	<0.70	<0.35	<0.35	<0.35	<0.35	<0.70	<0.91	<0.049
DG-Q15	3	7.5-8	DG-Q15S-7.5-8	1/11/2019	<0.30	<3.0	<0.60	<0.60	<3.0	<0.30	<1.5	**0.79**	<0.60	<0.30	<0.30	<0.30	<0.30	<0.60	<0.60	<0.60	<0.30	<0.60	<0.60	<0.30	**1.5**	<0.30	<0.30	<0.60	<0.78	<0.042
DG-R9	3	0.5-1	DG-R9S-0.5-1	1/22/2019	<0.50	<5.0	<1.0	<1.0	<5.0	<0.50	<2.5	<0.50	<1.0	<0.50	<0.50	<0.50	<0.50	<1.0	<1.0	<1.0	<0.50	<1.0	<1.0	<0.50	<0.50	<0.50	<0.50	<1.0	<1.3	<0.070
DG-R9	3	3.5-4	DG-R9S-3.5-4	1/22/2019	<0.43	<4.3	<0.85	<0.85	<4.3	<0.43	<2.1	<0.43	<0.85	<0.43	<0.43	<0.43	<0.43	<0.85	<0.85	<0.85	<0.43	<0.85	<0.85	<0.43	<0.43	<0.43	<0.43	<0.85	<1.1	<0.060
DG-R13	3	0.5-1	DG-R13S-0.5-1	1/28/2019	<88	<350	**310**	**350**	<880	<88	<350	**2,300**	<220	<88	<88	**210**	<88	<180	**830**	<180	<88	<88	<180	<88 U	**4,200**	<88	<88	<180	**4,300**	**30**
DG-R13	3	3.5-4	DG-R13S-3.5-4	1/28/2019	<0.43	<4.3	<0.86	<0.86	<4.3	<0.43	<2.2	**1.3**	<0.86	<0.43	<0.43	<0.43	<0.43	<0.86	<0.86	<0.86	<0.43	<0.86	<0.86	<0.43	**0.67 J**	<0.43	<0.43	<0.86	<1.1	<0.060
DG-R15	3	3.5-4	DG-R15S-3.5-4	12/21/2018	<160	<650	**11,000**	**6,000**	<1,600	**2,000**	<650	<160	<410	<160	<160	<160	**970**	<320	**2,900**	**1,700**	**1,600**	**1,600**	<320	<160	<160	<160	<160	<320	**2,200**	**1,300**
DG-R15	3	3.5-4	DG-R15S-3.5-4	2/5/2019	<0.34	<3.4	<0.69	<0.69	<3.4	<0.34	<1.7	<0.34	<0.69	<0.34	<0.34	<0.34	<0.34	<0.69	<0.69	<0.69	<0.34	<0.69	<0.69	<0.34	<0.34	<0.34	<0.34	<0.69	<0.90	<0.048
DG-S9	3	4.5-5	DG-S9S-4.5-5	12/20/2018	<0.26	<2.6	<0.53	<0.53	**22**	<0.26	<1.3	<0.26	<0.53	<0.26	<0.26	<0.26	<0.26	<0.53	<0.53	<0.53	<0.26	<0.53	<0.53	<0.26	<0.26	<0.26	<0.26	<0.53	<0.68	**0.061**
DG-S9	3	4.5-5	DG-S9S-4.5-5	2/4/2019	<0.40	<4.0	<0.80	<0.80	**22**	<0.40	<2.0	<0.40	<0.80	<0.40	<0.40	<0.40	<0.40	<0.80	<0.80	<0.80	<0.40	<0.80	<0.80	<0.40	**0.45 J**	<0.40	<0.40	<0.80	<1.0	<0.056

Table 5: Volatile Organic Compounds and Total Petroleum Hydrocarbons as Gasoline
Concentrations in Soil
Brisbane Baylands OU-2
Brisbane, California

Sample Location	Investigation Zone	Depth Range (ft bgs)	Sample Name	Collection Date	1,1,1-Trichloroethane	1,1,2-Trichloro-1,2,2-trifluoroethane	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	2-Butanone	4-Isopropyltoluene	4-Methyl-2-pentanone	Benzene	Carbon disulfide	Chloroform	cis-1,2-Dichloroethene	Ethylbenzene	Isopropylbenzene	Methyl-tert-butyl ether (MTBE)	Naphthalene	n-Butylbenzene	n-Propylbenzene	sec-Butylbenzene	tert-Butylbenzene	Tetrachloroethene (PCE)	Toluene	trans-1,2-Dichloroethene	Trichloroethene (TCE)	Vinyl Chloride	Xylenes, Total	TPH-Gasoline (C4-C12)
Direct Exposure Human Health Risk Level Residential Soil Exposure ESL [1]					1.7E+06	--	--	--	--	--	--	3.3E+02	--	3.2E+02	1.9E+04	5.9E+03	--	4.7E+04	3.8E+03	--	--	--	--	5.9E+02	1.1E+06	1.3E+05	9.5E+02	8.3E+00	5.8E+05	4.3E+05
Leaching to Groundwater Levels Non-drinking Water ESL [2]					7.0E+03	--	--	--	--	--	--	2.5E+01	--	2.3E+01	1.6E+03	4.3E+02	--	2.5E+03	1.2E+03	--	--	--	--	8.0E+01	1.0E+04	1.4E+04	8.5E+01	1.5E+00	1.0E+04	4.9E+03
USEPA RSL for Resident Soil [3]					8.1E+06	6.7E+06	3.0E+05	2.7E+05	2.7E+07	--	3.3E+07	1.2E+03	7.7E+05	3.2E+02	1.6E+05	5.8E+03	1.9E+06	4.7E+04	3.8E+03	3.9E+06	3.8E+06	7.8E+06	7.8E+06	2.4E+04	4.9E+06	1.6E+06	9.4E+02	5.9E+01	5.8E+05	--
				Units	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	mg/kg
DG-S9	3	7-7.5	DG-S9S-7-7.5	2/4/2019	<0.31	<3.1	<0.63	<0.63	<3.1	<0.31	<1.6	<0.31	<0.63	<0.31	<0.31	<0.31	<0.31	<0.63	<0.63	<0.63	<0.31	<0.63	<0.63	<0.31	**0.49 J**	<0.31	<0.31	<0.63	<0.82	**0.16**
DG-S9	3	7.5-8	DG-S9S-7.5-8	12/20/2018	<0.18	<1.8	<0.36	<0.36	**10**	<0.18	<0.90	<0.18	<0.36	<0.18	<0.18	<0.18	<0.18	<0.36	<0.36	<0.36	<0.18	<0.36	<0.36	<0.18	<0.18	<0.18	<0.18	<0.36	<0.47	**0.37**
DG-S11	3	0.5-1	DG-S11S-0.5-1	1/10/2019	<0.41	<4.1	<0.81	<0.81	<4.1	<0.41	<2.0	<0.41	<0.81	<0.41	<0.41	<0.41	<0.41	<0.81	<0.81	<0.81	<0.41	<0.81	<0.81	<0.41	<0.41	<0.41	<0.41	<0.81	<1.1	<0.057
DG-S11	3	3.5-4	DG-S11S-3.5-4	1/10/2019	<0.47	<4.7	<0.95 UJ	<0.95 UJ	<4.7	<0.47 UJ	<2.4	<0.47	<0.95	<0.47	<0.47	<0.47	<0.47	<0.95	<0.95 UJ	<0.95 UJ	<0.47 UJ	<0.95 UJ	<0.95 UJ	**1.2**	<0.47	<0.47	<0.47	<0.95	<1.2	<0.066
DG-S15	3	0.5-1	DG-S15S-0.5-1	1/11/2019	<0.39	<3.9	<0.78	<0.78	<3.9	<0.39	<2.0	<0.39	<0.78	<0.39	<0.39	<0.39	<0.39	<0.78	<0.78	<0.78	<0.39	<0.78	<0.78	**0.67 J**	<0.39	<0.39	<0.39	<0.78	<1.0	<0.055
DG-S15	3	3.5-4	DG-S15S-3.5-4	1/11/2019	<0.32	<3.2	<0.64	<0.64	<3.2	<0.32	<1.6	<0.32	<0.64	<0.32	<0.32	<0.32	<0.32	<0.64	<0.64	<0.64	<0.32	<0.64	<0.64	**6.2 J**	<0.32	<0.32	**3.5**	<0.64	<0.83	<0.044
DG-S15 (D)	3	3.5-4	DG-S15 (D)S-3.5-4	1/11/2019	<0.35	<3.5	<0.71	<0.71	<3.5	<0.35	<1.8	<0.35	<0.71	<0.35	<0.35	<0.35	<0.35	<0.71	<0.71	<0.71	<0.35	<0.71	<0.71	**3.3 J**	<0.35	<0.35	**2.7**	<0.71	<0.92	<0.049
DG-S15	3	6-6.5	DG-S15S-6-6.5	1/11/2019	<0.39	<3.9	<0.78	<0.78	<3.9	<0.39	<1.9	<0.39	<0.78	<0.39	<0.39	<0.39	<0.39	<0.78	<0.78	<0.78	<0.39	<0.78	<0.78	<0.39	<0.39	<0.39	**0.43 J**	<0.78	<1.0	**3.2**
DG-T9	3	0.5-1	DG-T9S-0.5-1	1/10/2019	<0.46	<4.6	<0.92	<0.92	<4.6	<0.46	<2.3	<0.46	<0.92	<0.46	<0.46	<0.46	<0.46	<0.92	<0.92	<0.92	<0.46	<0.92	<0.92	<0.46	<0.46	<0.46	<0.46	<0.92	<1.2	<0.064
DG-T9	3	3.5-4	DG-T9S-3.5-4	1/10/2019	<0.39	<3.9	<0.77	<0.77	<3.9	<0.39	<1.9	<0.39	<0.77	<0.39	<0.39	<0.39	<0.39	<0.77	<0.77	<0.77	<0.39	<0.77	<0.77	<0.39	<0.39	<0.39	<0.39	<0.77	<1.0	<0.054
DG-T13	3	0.5-1	DG-T13S-0.5-1	1/10/2019	<0.33	<3.3	<0.66	<0.66	<3.3	<0.33	<1.7	<0.33	<0.66	<0.33	<0.33	<0.33	<0.33	<0.66	<0.66	<0.66	<0.33	<0.66	<0.66	<0.33	<0.33	<0.33	<0.33	<0.66	<0.86	<0.046
DG-T13 (D)	3	0.5-1	DG-T13 (D)S-0.5-1	1/10/2019	<0.39	<3.9	<0.78	<0.78	<3.9	<0.39	<1.9	<0.39	<0.78	<0.39	<0.39	<0.39	<0.39	<0.78	<0.78	<0.78	<0.39	<0.78	<0.78	<0.39	<0.39	<0.39	<0.39	<0.78	<1.0	<0.055
DG-T13	3	3.5-4	DG-T13S-3.5-4	1/10/2019	<0.34	<3.4	<0.68	<0.68	<3.4	<0.34	<1.7	<0.34	<0.68	<0.34	<0.34	<0.34	<0.34	<0.68	<0.68	<0.68	<0.34	<0.68	<0.68	<0.34	<0.34	<0.34	<0.34	<0.68	<0.88	<0.047
DG-T17	3	0.5-1	DG-T17S-0.5-1	1/28/2019	<49	<200	**450**	**99**	<490	**720**	<200	**450**	<120	<49	<49	**280**	**62 J**	<98	**260**	<98	**56 J**	<49	<98	<49 U	**1,600**	<49	<49	<98	**1,700**	**28**
DG-T17	3	3.5-4	DG-T17S-3.5-4	1/28/2019	<0.42 U	<4.2	<0.84	<0.84	<4.2	<0.42	<2.1	<0.42	<0.84 U	<0.42	<0.42	<0.42	<0.42	<0.84	<0.84	<0.84	<0.42	<0.84	<0.84	<0.42	<0.42	<0.42	<0.42	<0.84	<1.1	<0.059
DG-T17	3	7-7.5	DG-T17S-7-7.5	1/28/2019	<0.50	<5.0	<1.0	<1.0	**19**	<0.50	<2.5	<0.50	<1.0	<0.50	<0.50	<0.50	<0.50	<1.0	<1.0	<1.0	<0.50	<1.0	<1.0	<0.50	<0.50	<0.50	<0.50	<1.0	<1.3	<0.067
DG-T17 (D)	3	7-7.5	DG-T17 (D)S-7-7.5	1/28/2019	<0.52	<5.2	<1.0	<1.0	**18**	<0.52	<2.6	<0.52	<1.0	<0.52	<0.52	<0.52	<0.52	<1.0	<1.0	<1.0	<0.52	<1.0	<1.0	<0.52	<0.52	<0.52	<0.52	<1.0	<1.3	**0.19 J**
DG-U11	3	0.5-1	DG-U11S-0.5-1	1/10/2019	<0.39	<3.9	<0.77 UJ	<0.77 UJ	<3.9	<0.39 UJ	<1.9	<0.39	<0.77	<0.39	<0.39	<0.39	<0.39	<0.77	**3.0 J+**	<0.77 UJ	<0.39 UJ	<0.77 UJ	<0.77 UJ	<0.39	<0.39	<0.39	<0.39	<0.77	<1.0	**4.1**
DG-U11	3	3.5-4	DG-U11S-3.5-4	1/10/2019	<0.48	<4.8	<0.96	<0.96	<4.8	<0.48	<2.4	<0.48	<0.96	<0.48	<0.48	<0.48	<0.48	<0.96	<0.96	<0.96	<0.48	<0.96	<0.96	<0.48	<0.48	<0.48	<0.48	<0.96	<1.2	<0.067
DG-U13	3	7.5-8	DG-U13S-7.5-8	12/21/2018	<0.21	<2.1	<0.43	<0.43	<2.1	<0.21	<1.1	<0.21	<0.43	<0.21	**0.27 J**	<0.21	<0.21	<0.43	<0.43	<0.43	<0.21	<0.43	<0.43	<0.21	<0.21	<0.21	<0.21	<0.43	<0.56	**0.45**
DG-U13	3	7.5-8	DG-U13S-7.5-8	2/1/2019	<0.36	<3.6	<0.71	<0.71	<3.6	**0.70 J**	<1.8	<0.36	**1.4**	<0.36	**0.75**	<0.36	<0.36	<0.71	<0.71	<0.71	<0.36	<0.71	<0.71	<0.36	<0.36	<0.36	<0.36	**0.81 J**	<0.93	**0.74**
DG-U15	3	3.5-4	DG-U15S-3.5-4	1/28/2019	<0.40	<4.0	<0.79	<0.79	<4.0	<0.40	<2.0	**0.45 J**	<0.79	<0.40	<0.40	<0.40	<0.40	<0.79	<0.79	<0.79	<0.40	<0.79	<0.79	<0.40	<0.40	<0.40	<0.40	<0.79	<1.0	<0.055
DG-U15	3	8.5-9	DG-U15S-8.5-9	1/28/2019	<0.44	<4.4	<0.88	<0.88	<4.4	<0.44	<2.2	**1.2 J**	<0.44	<0.44	<0.44	<0.44	<0.44	<0.88	<0.88	<0.88	<0.44	<0.88	<0.88	<0.44	<0.44	<0.44	<0.44	<0.88	<1.1	**1**
DG-U17	3	0.5-1	DG-U17S-0.5-1	1/28/2019	<0.71	<7.1	<1.4	<1.4	<7.1	<0.71	<3.5	<0.71	<1.4	<0.71	<0.71	<0.71	<0.71	<1.4	<1.4	<1.4	<0.71	<1.4	<1.4	<0.71	<0.71	<0.71	<0.71	<1.4	<1.8	<0.099
DG-V13	3	0.5-1	DG-V13S-0.5-1	1/10/2019	<1.0	<10	<2.0	<2.0	<10	<1.0	<5.0	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0	<2.0	<1.0	<2.0	<2.0	<1.0	<1.0	<1.0	<1.0	<2.0	<2.6	<0.14
DG-V13	3	3.5-4	DG-V13S-3.5-4	1/10/2019	<0.44	<4.4	<0.89	<0.89	<4.4	<0.44	<2.2	<0.44	<0.89	<0.44	<0.44	<0.44	<0.44	<0.89	<0.89	<0.89	<0.44	<0.89	<0.89	<0.44	<0.44	<0.44	<0.44	<0.89	<1.2	<0.062
DG-V13	3	7.5-8	DG-V13S-7.5-8	1/10/2019	<0.39	<3.9	<0.78	<0.78	<3.9	<0.39	<2.0	<0.39	<0.78	<0.39	<0.39	<0.39	<0.39	<0.78	<0.78	<0.78	<0.39	<0.78	<0.78	<0.39	<0.39	<0.39	<0.39	<0.78	<1.0	<0.055
DG-V17	3	0.5-1	DG-V17S-0.5-1	1/28/2019	<0.40	<4.0	<0.81	<0.81	<4.0	<0.40	<2.0	<0.40	<0.81	<0.40	<0.40	<0.40	<0.40	<0.81	<0.81	<0.81	<0.40	<0.81	<0.81	<0.40	<0.40	<0.40	<0.40	<0.81	<1.1	<0.057
DG-V17	3	3.5-4	DG-V17S-3.5-4	1/28/2019	<0.34	<3.4	<0.68	<0.68	<3.4	<0.34	<1.7	**0.35 J**	<0.68	<0.34	<0.34	<0.34	<0.34	<0.68	<0.68	<0.68	<0.34	<0.68	<0.68	<0.34	**0.58 J**	<0.34	<0.34	<0.68	<0.88	<0.047
DG-V17 (D)	3	3.5-4	DG-V17 (D)S-3.5-4	1/28/2019	<0.37	<3.7	<0.74	<0.74	<3.7	<0.37	<1.8	<0.37	<0.74	<0.37	<0.37	<0.37	<0.37	<0.74	<0.74	<0.74	<0.37	<0.74	<0.74	<0.37	<0.37 UJ	<0.37	<0.37	<0.74	<0.96	<0.052
DG-V17	3	9.5-10	DG-V17S-9.5-10	1/28/2019	<0.53	<5.3	<1.1	<1.1	**25**	<0.53	<2.6	<0.53	<1.1	<0.53	<0.53	<0.53	<0.53	<1.1	<1.1	<1.1	<0.53	<1.1	<1.1	<0.53	<0.53	<0.53	<0.53	<1.1	<1.4	<0.074
DG-W11	4	0.5-1	DG-W11S-0.5-1	1/29/2019	<0.37	<3.7	<0.74 U	<0.74 U	<3.7	<0.37 U	<1.8	<0.37	<0.74	<0.37	<0.37	<0.37	<0.37	<0.74	<0.74	<0.74 U	<0.37 U	<0.74 U	<0.74 U	<0.37	<0.37	<0.37	<0.37	<0.74	<0.96	<0.051
DG-W11	4	3.5-4	DG-W11S-3.5-4	1/29/2019	<0.38	<3.8	<0.77 U	<0.77 U	<3.8	<0.38 U	<1.9	<0.38	<0.77	<0.38	<0.38	<0.38	<0.38	<0.77	<0.77	<0.77 U	<0.38 U	<0.77 U	<0.77 U	<0.38	<0.38	<0.38	<0.38	<0.77	<1.0	<0.054
DG-W11 (D)	4	3.5-4	DG-W11 (D)S-3.5-4	1/29/2019	<0.39	<3.9	<0.78	<0.78	<3.9	<0.39	<1.9 R	<0.39	<0.78	<0.39	<0.39	<0.39	<0.39	<0.78	<0.78	<0.78	<0.39	<0.78	<0.78	<0.39	<0.39	<0.39	<0.39	<0.78	<1.0	<0.055
DG-W15	4	0.5-1	DG-W15S-0.5-1	1/28/2019	<0.46	<4.6	<0.93	<0.93	<4.6	<0.46	<2.3	<0.46	<0.93	<0.46	<0.46	<0.46	<0.46	<0.93	<0.93	<0.93	<0.46	<0.93	<0.93	<0.46	**0.53 J**	<0.46	<0.46	<0.93	<1.2	<0.065
DG-W15 (D)	4	0.5-1	DG-W15 (D)S-0.5-1	1/28/2019	<0.41	<4.1	<0.83	<0.83	<4.1	<0.41	<2.1	<0.41	<0.83	<0.41	<0.41	<0.41	<0.41	<0.83	<0.83	<0.83	<0.41	<0.83	<0.83	<0.41	<0.41 UJ	<0.41	<0.41	<0.83	<1.1	<0.058
DG-W15	4	3.5-4	DG-W15S-3.5-4	1/28/2019	<0.70	<7.0	<1.4 UJ	<1.4 UJ	<7.0	<0.70 UJ	<3.5	<0.70	<1.4	<0.70	<0.70	<0.70 UJ	<0.70 UJ	<1.4	<1.4 UJ	<1.4 UJ	<0.70 UJ	<1.4 UJ	<1.4 UJ	<0.70 UJ	**3**	<0.70	<0.70	<1.4	<1.8 UJ	**0.24**
DG-X13	4	0.5-1	DG-X13S-0.5-1	1/22/2019	<0.53	<5.3	<1.1	<1.1	<5.3	<0.53	<2.6	<0.53	<1.1	<0.53	<0.53	<0.53	<0.53	<1.1	<1.1	<1.1	<0.53	<1.1	<1.1	<0.53	<0.53	<0.53	<0.53 *	<1.1	<1.4	<0.074
DG-X13	4	3.5-4	DG-X13S-3.5-4	1/22/2019	<0.39	<3.9	<0.78	<0.78	<3.9	<0.39	<2.0	<0.39	<0.78	<0.39	<0.39	<0.39	<0.39	<0.78	<0.78	<0.78	<0.39	<0.78	<0.78	<0.39	<0.39	<0.39	<0.39	<0.78	<1.0	<0.055
DG-X13 (D)	4	3.5-4	DG-X13 (D)S-3.5-4	1/22/2019	<0.34	<3.4	<0.68	<0.68	<3.4	<0.34	<1.7	<0.34	<0.68	<0.34	<0.34	<0.34	<0.34	<0.68	<0.68	<0.68	<0.34	<0.68	<0.68	<0.34	<0.34	<0.34	<0.34	<0.68	<0.88	<0.047
DG-X17	4	0.5-1	DG-X17S-0.5-1	1/28/2019	<0.49	<4.9	<0.97	<0.97	<4.9	<0.49	<2.4	<0.49	<0.97	<0.49	<0.49	<0.49	<0.49	<0.97	<0.97	<0.97	<0.49	<0.97	<0.97	<0.49	<0.49	<0.49	<0.49	<0.97	<1.3	<0.068
DG-X17	4	3.5-4	DG-X17S-3.5-4	1/28/2019	<0.39	<3.9	<0.78	<0.78	<3.9	<0.39	<1.9	<0.39	<0.78	<0.39	<0.39	<0.39	<0.39	<0.78	<0.78	<0.78	<0.39	<0.78	<0.78	<0.39	<0.39	<0.39	<0.39	<0.78	<1.0	<0.054
DG-Y11	4	0.5-1	DG-Y11S-0.5-1	1/21/2019	<0.37	<3.7	<0.75	<0.75	<3.7	<0.37	<1.9	<0.37	<0.75	<0.37	<0.37	<0.37	<0.37	<0.75	<0.75	<0.75	<0.37	<0.75	<0.75	<0.37	<0.37	<0.37	<0.37	<0.75	<0.97	<0.052
DG-Y11	4	3.5-4	DG-Y11S-3.5-4	1/21/2019	<0.37	<3.7	<0.74	<0.74	<3.7	<0.37	<1.8	<0.37	<0.74	<0.37	<0.37	<0.37	<0.37	<0.74	<0.74	<0.74	<0.37	<0.74	<0.74	<0.37	<0.37	<0.37	<0.37	<0.74	<0.96	<0.052
DG-Y15	4	0.5-1	DG-Y15S-0.5-1	1/31/2019	<0.44	<4.4	<0.89	<0.89	<4.4	<0.44	<2.2	<0.44	<0.89	<0.44	<0.44	<0.44	<0.44	<0.89	<0.89	<0.89	<0.44	<0.89	<0.89	**0.45 J**	<0.44	<0.44	<0.44	<0.89	<1.2	<0.062
DG-Y15	4	3.5-4	DG-Y15S-3.5-4	1/31/2019	<0.44	<4.4	<0.88	<0.88	<4.4	<0.44	<2.2	<0.44	<0.88	<0.44	<0.44	<0.44	<0.44	<0.88	<0.88	<0.88	<0.44	<0.88	<0.88	**1.2**	<0.44	<0.44	<0.44	<0.88	<1.1	<0.062
DG-Y15 (D)	4	3.5-4	DG-Y15 (D)S-3.5-4	1/31/2019	<0.36	<3.6	<0.73	<0.73	<3.6	<0.36	<1.8	<0.36	<0.73	<0.36	<0.36	<0.36	<0.36	<0.73	<0.73	<0.73	<0.36	<0.73	<0.73	**1.1**	<0.36	<0.36	<0.36	<0.73	<0.94	<0.051
DG-Y15	4	7.5-8	DG-Y15S-7.5-8	1/31/2019	**120 J**	<400	<100	<100	<1,000	<100	<400	<100	<250	<100	**540**	<100	<100	<200	<200	<200	<100	<100	<200	<100	<100	<100	**100 J**	<200	<200	**210**
DG-Y19	4	0.5-1	DG-Y19S-0.5-1	1/28/2019	<0.45	<4.5	<0.90	<0.90	<4.5	<0.45	<2.3	<0.45	<0.90	<0.45	<0.45	<0.45	<0.45	<0.90	<0.90	<0.90	<0.45	<0.90	<0.90	<0.45	<0.45	<0.45	<0.45	<0.90	<1.2	<0.060
DG-Y19	4	3.5-4	DG-Y19S-3.5-4	1/28/2019	<0.36	<3.6	<0.73	<0.73	<3.6	<0.36	<1.8	<0.36	<0.73	<0.36	<0.36	<0.36	<0.36	<0.73	<0.73	<0.73	<0.36	<0.73	<0.73	<0.36	<0.36	<0.36	<0.36	<0.73	<0.95	<0.047
DG-Y19	4	7.5-8	DG-Y19S-7.5-8	1/28/2019	<0.36	<3.6	<0.73	<0.73	<3.6	<0.36	<1.8	<0.36	<0.73	<0.36	<0.36	<0.36	<0.36	<0.73	<0.73	<0.73	<0.36	<0.73	<0.73	<0.36	<0.36	<0.36	<0.36	<0.73	<0.95	<0.051
DG-Z13	4	0.5-1	DG-Z13S-0.5-1	1/28/2019	<0.51	<5.1	<1.0	<1.0	**16**	<0.51	<2.6	**0.60 J**	<1.0	<0.51	<0.51	**0.91 J**	<0.51	<1.0	**5.1**	<1.0	<0.51	<1.0	<1.0	<0.51	**2.7**	<0.51	<0.51	<1.0	**12**	**0.1**
DG-Z13	4	3.5-4	DG-Z13S-3.5-4	1/28/2019	<0.35	<3.5	<0.70	<0.70	<3.5	<0.35	<1.7	<0.35	<0.70	<0.35	<0.35	<0.35	<0.35	<0.70	<0.70	<0.70	<0.35	<0.70	<0.70	<0.35	<0.35	<0.35	<0.35	<0.70	<0.91	<0.049
DG-Z17	4	0.5-1	DG-Z17S-0.5-1	1/28/2019	<0.47	<4.7	<0.94	<0.94	<4.7	<0.47	<2.3	<0.47	<0.94	<0.47	<0.47	<0.47	<0.47	<0.94	<0.97	<0.94	<0.47	<0.94	<0.94	<0.47	<0.47	<0.47	<0.47	<0.94	<1.2	<0.066
DG-Z17 (D)	4	0.5-1	DG-Z17 (D)S-0.5-1	1/28/2019	<0.45	<4.5	<0.89	<0.89	<4.5	<0.45	<2.2	<0.45	<0.89	<0.45	<0.45	<0.45	<0.45	<0.89	<0.89	<0.89	<0.45	<0.89	<0.89	<0.45	**0.80 J**	<0.45	<0.45	<0.89	<1.2	<0.063
DG-Z17	4	3.5-4	DG-Z17S-3.5-4	1/28/2019	<0.43	<4.3	<0.85	<0.85	<4.3	<0.43	<2.1	<0.43	<0.85	<0.43	<0.43	<0.43	<0.43	<0.85	<0.85	<0.85	<0.43	<0.85	<0.85	**2.2**	<0.43	<0.43	<0.43	<0.85	<1.1	<0.060
DG-Z17	4	7.5-8	DG-Z17S-7.5-8	1/28/2019	<43	<170	<43	<43	<430	<43	<170	<43	<110	<43	<43	<43	<43	<86	<86	<86	<43	<43	<86	<43 U	<43	<43	<43	<86	<86	**39**

Table 5: Volatile Organic Compounds and Total Petroleum Hydrocarbons as Gasoline
Concentrations in Soil
Brisbane Baylands OU-2
Brisbane, California

Sample Location	Investigation Zone	Depth Range (ft bgs)	Sample Name	Collection Date	1,1,1-Trichloroethane	1,1,2-Trichloro-1,2,2-trifluoroethane	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	2-Butanone	4-Isopropyltoluene	4-Methyl-2-pentanone	Benzene	Carbon disulfide	Chloroform	cis-1,2-Dichloroethene	Ethylbenzene	Isopropylbenzene	Methyl-tert-butyl ether (MTBE)	Naphthalene	n-Butylbenzene	n-Propylbenzene	sec-Butylbenzene	tert-Butylbenzene	Tetrachloroethene (PCE)	Toluene	trans-1,2-Dichloroethene	Trichloroethene (TCE)	Vinyl Chloride	Xylenes, Total	TPH-Gasoline (C4-C12)
Direct Exposure Human Health Risk Level Residential Soil Exposure ESL [1]					1.7E+06	--	--	--	--	--	--	3.3E+02	--	3.2E+02	1.9E+04	5.9E+03	--	4.7E+04	3.8E+03	--	--	--	--	5.9E+02	1.1E+06	1.3E+05	9.5E+02	8.3E+00	5.8E+05	4.3E+05
Leaching to Groundwater Levels Non-drinking Water ESL [2]					7.0E+03	--	--	--	--	--	--	2.5E+01	--	2.3E+01	1.6E+03	4.3E+02	--	2.5E+03	1.2E+03	--	--	--	--	8.0E+01	1.0E+04	1.4E+04	8.5E+01	1.5E+00	1.0E+04	4.9E+03
USEPA RSL for Resident Soil [3]					8.1E+06	6.7E+06	3.0E+05	2.7E+05	2.7E+07	--	3.3E+07	1.2E+03	7.7E+05	3.2E+02	1.6E+05	5.8E+03	1.9E+06	4.7E+04	3.8E+03	3.9E+06	3.8E+06	7.8E+06	7.8E+06	2.4E+04	4.9E+06	1.6E+06	9.4E+02	5.9E+01	5.8E+05	--
Units					µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	mg/kg
DG-AA11	4	0.5-1	DG-AA11S-0.5-1	1/29/2019	<0.37	<3.7	<0.74 U	<0.74 U	<3.7	<0.37 U	<1.9	<0.37	<0.74	<0.37	<0.37	<0.37	<0.37	<0.74	<0.74	<0.74 U	<0.37 U	<0.74 U	<0.74 U	<0.37	<0.37	<0.37	<0.37	<0.74	<0.96	<0.052
DG-AA11	4	3.5-4	DG-AA11S-3.5-4	1/29/2019	<210	<850	<210	<210	<2,100	<210	<850	<210	<530	<210	<210	<210	<210	<430	<430	<430	<210	<210	<430	<210	<210	<210	<210	<430	<430	**390**
DG-AA15	4	0.5-1	DG-AA15S-0.5-1	1/22/2019	<0.39	<3.9	<0.79	<0.79	<3.9	<0.39	<2.0	<0.39	<0.79	<0.39	<0.39	<0.39	<0.39	<0.79	<0.79	<0.79	<0.39	<0.79	<0.79	<0.39	<0.39	<0.39	<0.39 *	<0.79	<1.0	<0.055
DG-AA19	4	0.5-1	DG-AA19S-0.5-1	1/24/2019	<0.50	<5.0	<1.0	<1.0	<5.0	<0.50	<2.5	<0.50	<1.0	<0.50	<0.50	<0.50	<0.50	<1.0	<1.0	<1.0	<0.50	<1.0	<1.0	<0.50	<0.50	<0.50	<0.50	<1.0	<1.3	<0.070
DG-AA19	4	3.5-4	DG-AA19S-3.5-4	1/24/2019	<0.43	<4.3	<0.85	<0.85	<4.3	<0.43	<2.1	<0.43	<0.85	<0.43	<0.43	<0.43	<0.43	<0.85	<0.85	<0.85	<0.43	<0.85	<0.85	<0.43	<0.43	<0.43	<0.43	<0.85	<1.1	**0.69**
DG-AA19	4	8.5-9	DG-AA19S-8.5-9	1/24/2019	<0.38	<3.8	<0.76	<0.76	**8**	<0.38	<1.9	<0.38	<0.76	<0.38	<0.38	<0.38	<0.38	<0.76	<0.76	<0.76	<0.38	<0.76	<0.76	<0.38	<0.38	<0.38	<0.38	<0.76	<0.98	<0.053
DG-AB13	4	0.5-1	DG-AB13S-0.5-1	1/22/2019	<0.34	<3.4	<0.69	<0.69	<3.4	<0.34	<1.7	<0.34	<0.69	<0.34	<0.34	<0.34	<0.34	<0.69	<0.69	<0.69	<0.34	<0.69	<0.69	<0.34	<0.34	<0.34	<0.34 *	<0.69	<0.90	<0.048
DG-AB13	4	3.5-4	DG-AB13S-3.5-4	1/22/2019	<0.41	<4.1	<0.81	<0.81	<4.1	<0.41	<2.0	<0.41	<0.81	<0.41	<0.41	<0.41	<0.41	<0.81	<0.81	<0.81	<0.41	<0.81	<0.81	<0.41	<0.41	<0.41	<0.41 *	<0.81	<1.1	<0.057
DG-AB13 (D)	4	3.5-4	DG-AB13 (D)S-3.5-4	1/22/2019	<0.47	<4.7	<0.94	<0.94	<4.7	<0.47	<2.4	<0.47	<0.94	<0.47	<0.47	<0.47	<0.47	<0.94	<0.94	<0.94	<0.47	<0.94	<0.94	<0.47	<0.47	<0.47	<0.47	<0.94	<1.2	<0.066
DG-AB13	4	13.5-14	DG-AB13S-13.5-14	1/22/2019	<600	<2,400	**8,600**	**1,800**	<6,000	**2,100**	<2,400	<600	<1,500	<600	<600	**730 J**	**1,200**	<1,200	**7,400**	**3,800**	**2,100**	**1,000 J**	<1,200	<600	<600	<600	<600	<1,200	**7,600**	**2,400**
DG-AC11	4	0.5-1	DG-AC11S-0.5-1	1/29/2019	<190	<740	<190	<190	<1,900	<190	<740	<190	<460	<190	<190	<190	<190	<370	<370 U	<370	<190	<190	<370	<190	<190	<190	<190	<370	<370	**220**
DG-AC11	4	3.5-4	DG-AC11S-3.5-4	1/29/2019	<0.36	<3.6	<0.71 U	<0.71 U	**6.9 J**	<0.36 U	<1.8	<0.36	<0.71	<0.36	<0.36	<0.36	<0.36	<0.71	<0.71	<0.71 U	<0.36 U	<0.71 U	<0.71 U	<0.36	<0.36	<0.36	<0.36	<0.71	<0.92	**0.099**
DG-AC11	4	8.5-9	DG-AC11S-8.5-9	1/29/2019	<0.36	<3.6	<0.71 U	<0.71 U	<3.6	<0.36 U	<1.8	<0.36	**2.7**	<0.36	<0.36	<0.36	<0.36	<0.71	<0.71	<0.71 U	<0.36 U	<0.71 U	<0.71 U	<0.36	**0.60 J**	<0.36	<0.36	<0.71	<0.93	<0.050
DG-AD13	4	0.5-1	DG-AD13S-0.5-1	2/1/2019	<0.40	<4.0	<0.80	<0.80	<4.0	<0.40	<2.0	<0.40	<0.80	<0.40	<0.40	<0.40	<0.40	<0.80	<0.80	<0.80	<0.40	<0.80	<0.80	<0.40	<0.40	<0.40	<0.40	<0.80	<1.0	<0.056
DG-AD13	4	3.5-4	DG-AD13S-3.5-4	2/1/2019	<0.40	<4.0	<0.79	<0.79	<4.0	<0.40	<2.0	**0.45 J**	**1.2 J**	<0.40	<0.40	<0.40	<0.40	<0.79	<0.79	<0.79	<0.40	<0.79	<0.79	<0.40	<0.40	<0.40	<0.40	<0.79	<1.0	<0.055
DG-AD13	4	7.5-8	DG-AD13S-7.5-8	2/1/2019	<200	<810	**1,800 J**	**480 J**	<2,000	**400 J**	<810	<200	<500	<200	<200	**590 J**	**200 J**	<400	**4,100 J**	**460 J**	**310 J**	**210 J**	<400	<200	**520 J**	<200	<200	<400	**1,700 J**	**370**
DG-AD13 (D)	4	7.5-8	DG-AD13 (D)S-7.5-8	2/1/2019	<160	<620	**1,000 J**	**290 J**	<1,600	**230 J**	<620	<160	<390	<160	<160	**290 J**	<160 UJ	<310	**2,100 J**	<310 UJ	**200 J**	<160 UJ	<310	<160	**240 J**	<160	<160	<310	**940 J**	**250**
DG-AE11	4	0.5-1	DG-AE11S-0.5-1	1/21/2019	<0.36	<3.6	<0.73	<0.73	<3.6	<0.36	<1.8	<0.36	<0.73	<0.36	<0.36	<0.36	<0.36	<0.73	<0.73	<0.73	<0.36	<0.73	<0.73	<0.36	<0.36	<0.36	<0.36	<0.73	<0.95	**0.46**
DG-AE11	4	3.5-4	DG-AE11S-3.5-4	1/21/2019	<0.40	<4.0	<0.80	<0.80	<4.0	<0.40	<2.0	<0.40	<0.80	<0.40	<0.40	<0.40	<0.40	<0.80	<0.80	<0.80	<0.40	<0.80	<0.80	<0.40	<0.40	<0.40	<0.40 U	<0.80	<1.0	**0.15**
DG-AF13	4	0.5-1	DG-AF13S-0.5-1	1/28/2019	<0.43	<4.3	<0.85	<0.85	<4.3	<0.43	<2.1	<0.43	<0.85	<0.43	<0.43	<0.43	<0.43	<0.85	<0.85	<0.85	<0.43	<0.85	<0.85	<0.43	<0.43	<0.43	<0.43	<0.85	<1.1	<0.060
DG-AF13	4	3.5-4	DG-AF13S-3.5-4	1/28/2019	<0.33	<3.3	<0.66	<0.66	<3.3	<0.33	<1.7	<0.33	<0.66	<0.33	<0.33	<0.33	<0.33	<0.66	<0.66	<0.66	<0.33	<0.66	<0.66	<0.33	<0.33	<0.33	<0.33	<0.66	<0.86	<0.047
DG-AG11	4	0.5-1	DG-AG11S-0.5-1	1/21/2019	<0.38	<3.8	<0.76	<0.76	<3.8	<0.38	<1.9	<0.38	<0.76	<0.38	<0.38	<0.38	<0.38	<0.76	<0.76	<0.76	<0.38	<0.76	<0.76	<0.38	<0.38	<0.38	<0.38	<0.76	<0.99	<0.053
DG-AG11	4	3.5-4	DG-AG11S-3.5-4	1/21/2019	<0.36	<3.6	<0.72	<0.72	**7.8**	<0.36	<1.8	<0.36	<0.72	<0.36	<0.36	<0.36	<0.36	<0.72	<0.72	<0.72	<0.36	<0.72	<0.72	<0.36	<0.36	<0.36	<0.36	<0.72	<0.94	<0.051
DG-AG11	4	9.5-10	DG-AG11S-9.5-10	1/21/2019	<78	<310	<78	<78	<780	<78	<310	<78	<200	<78	<78	<78	**99 J**	<160	<160	**160 J**	**120 J**	**110 J**	<160	<78	<78	<78	<78	<160	<160	**160**
DG-AH13	4	0.5-1	DG-AH13S-0.5-1	1/29/2019	<0.33	<3.3	<0.67 U	<0.67 U	<3.3	<0.33 U	<1.7	<0.33	<0.67	<0.33	<0.33	<0.33	<0.33	<0.67	<0.67	<0.67 U	<0.33 U	<0.67 U	<0.67 U	<0.33	<0.33	<0.33	<0.33	<0.67	<0.87	<0.047
DG-AH13	4	3.5-4	DG-AH13S-3.5-4	1/29/2019	<0.42	<4.2	<0.84	<0.84	<4.2	<0.42	<2.1	<0.42	<0.84	<0.42	<0.42	<0.42	<0.42	<0.84	<0.84	<0.84	<0.42	<0.84	<0.84	<0.42	<0.42	<0.42	<0.42	<0.84	<1.1	<0.059
DG-AH13	4	7.5-8	DG-AH13S-7.5-8	1/29/2019	<47	<190	<47	<47	<470	<47	<190	**82 J**	**210 J**	<47	<47	**59 J**	**330**	<93	**130 J**	**370**	**490**	**300**	<93	<47	<47	<47	<47	<93	<93	**120**
DG-AI11	4	0.5-1	DG-AI11S-0.5-1	1/21/2019	<0.73	<7.3	<1.5	<1.5	<7.3	<0.73	<3.6	**1.3 J**	<1.5	<0.73	<0.73	<0.73	<0.73	<1.5	<1.5	<1.5	<0.73	<1.5	<1.5	<0.73	<0.73	<0.73	<0.73 U	<1.5	<1.9	<0.10
DG-AI11 (D)	4	0.5-1	DG-AI11 (D)S-0.5-1	1/21/2019	<0.31	<3.1	<0.62	<0.62	<3.1	<0.31	<1.6	<0.31 UJ	<0.62	<0.31	<0.31	<0.31	<0.31	<0.62	<0.62	<0.62	<0.31	<0.62	<0.62	<0.31	<0.31	<0.31	<0.31	<0.62	<0.81	<0.043
DG-AI11	4	3.5-4	DG-AI11S-3.5-4	1/21/2019	<41	<160	<41	<41	<410	<41	<160	<41	<100	<41	<41	<41	<41	<82	<82	<82	<41	<41	<82	<41	<41	<41	<41	<82	<82	**46**
DG-AI11	4	9.5-10	DG-AI11S-9.5-10	1/21/2019	<0.55	<5.5	<1.1	<1.1	<5.5	<0.55	<2.7	<0.55	<1.1	<0.55	<0.55	<0.55	**0.77 J**	<1.1	**2.1 J**	<1.1	<0.55	<1.1	<1.1	<0.55	<0.55	<0.55	<0.55 U	<1.1	<1.4	**0.46**
DG-AJ13	4	0.5-1	DG-AJ13S-0.5-1	1/29/2019	<0.50	<5.0	<1.0 U	<1.0 U	<5.0	<0.50 U	<2.5	<0.50	<1.0	<0.50	<0.50	<0.50	<0.50	<1.0	<1.0	<1.0 U	<0.50 U	<1.0 U	<1.0 U	<0.50	<0.50	<0.50	<0.50	<1.0	<1.3	<0.070
DG-AJ13	4	3.5-4	DG-AJ13S-3.5-4	1/29/2019	<0.35	<3.5	<0.69 U	<0.69 U	<3.5	<0.35 U	<1.7	<0.35	<0.69	<0.35	<0.35	<0.35	<0.35	<0.69	<0.69	<0.69 U	<0.35 U	<0.69 U	<0.69 U	<0.35	<0.35	<0.35	<0.35	<0.69	<0.90	<0.049
DG-AK11	4	0.5-1	DG-AK11S-0.5-1	1/22/2019	<0.44	<4.4	<0.88	<0.88	<4.4	**0.82 J**	<2.2	<0.44	<0.88	<0.44	<0.44	<0.44	**2**	<0.88	**1.1 J**	**0.90 J**	**0.66 J**	<0.88	<0.88	<0.44	<0.44	<0.44	<0.44 *	<0.88	**1.3 J**	**0.75**
DG-AK11	4	3.5-4	DG-AK11S-3.5-4	1/22/2019	<150	<590	<150	<150	<1,500	<150	<590	<150	<370	<150	<150	<150	<150	<300	<300	<300	<150	<150	<300	<150	<150	<150	<150	<300	<300	**100**
DG-AL13	4	0.5-1	DG-AL13S-0.5-1	1/29/2019	<0.35	<3.5	<0.71 U	<0.71 U	<3.5	<0.35 U	<1.8	<0.35	<0.71	<0.35	<0.35	<0.35	<0.35	<0.71	<0.71	<0.71 U	<0.35 U	<0.71 U	<0.71 U	<0.35	<0.35	<0.35	<0.35	<0.71	<0.92	<0.049
DG-AL13	4	3.5-4	DG-AL13S-3.5-4	1/29/2019	<0.34	<3.4	<0.68 U	<0.68 U	<3.4	<0.34 U	<1.7	<0.34	<0.68	<0.34	<0.34	<0.34	<0.34	<0.68	<0.68	<0.68 U	<0.34 U	<0.68 U	<0.68 U	<0.34	<0.34	<0.34	<0.34 *	<0.68	<0.88	<0.048
DG-AM11	4	0.5-1	DG-AM11S-0.5-1	1/22/2019	<0.37	<3.7	<0.75	<0.75	<3.7	<0.37	<1.9	<0.37	<0.75	<0.37	<0.37	<0.37	<0.37	<0.75	<0.75	<0.75	<0.37	<0.75	<0.75	<0.37	<0.37	<0.37	<0.37 *	<0.75	<0.97	<0.052
DG-AM11	4	3.5-4	DG-AM11S-3.5-4	1/22/2019	<0.39	<3.9	<0.78	<0.78	<3.9	<0.39	<1.9	**0.45 J**	<0.78	<0.39	<0.39	<0.39	<0.39	<0.78	<0.78	<0.78	<0.39	<0.78	<0.78	<0.39	<0.39	<0.39	<0.39 *	<0.78	<1.0	<0.054
DG-AN13	4	0.5-1	DG-AN13S-0.5-1	1/31/2019	<0.48	<4.8	<0.96	<0.96	<4.8	<0.48	<2.4	<0.48	<0.96	<0.48	<0.48	<0.48	<0.48	<0.96	<0.96	<0.96	<0.48	<0.96	<0.96	<0.48	<0.48	<0.48	<0.48	<0.96	<1.3	<0.067
DG-AN13	4	3.5-4	DG-AN13S-3.5-4	1/31/2019	<0.36	<3.6	<0.72	<0.72	<3.6	<0.36	<1.8	<0.36	<0.72	<0.36	<0.36	<0.36	<0.36	<0.72	<0.72	<0.72	<0.36	<0.72	<0.72	<0.36	<0.36	<0.36	<0.36	<0.72	<0.93	<0.050
DG-AN13	4	9.5-10	DG-AN13S-9.5-10	1/31/2019	<0.50	<5.0	<0.99	<0.99	**46**	<0.50	<2.5	<0.50	**1.4 J**	<0.50	<0.50	<0.50	<0.50	<0.99	<0.99	**1.2 J**	<0.50	<0.99	<0.99	<0.50	<0.50	<0.50	<0.50	<0.99	<1.3	**0.079 J**
DG-AO11	5	0.5-1	DG-AO11S-0.5-1	1/22/2019	<0.40	<4.0	<0.79	<0.79	<4.0	<0.40	<2.0	<0.40	<0.79	<0.40	<0.40	<0.40	<0.40	<0.79	<0.79	<0.79	<0.40	<0.79	<0.79	<0.40	<0.40	<0.40	<0.40 *	<0.79	<1.0	<0.055
DG-AO11	5	3.5-4	DG-AO11S-3.5-4	1/22/2019	<150	<590	<150	<150	<1,500	<150	<590	<150	<370	<150	<150	<150	<150	<300	<300	<300	<150	<150	<300	<150	<150	<150	<150	<300	<300	**270**
DG-AQ11	5	0.5-1	DG-AQ11S-0.5-1	1/30/2019	<0.42	<4.2	<0.85	<0.85	<4.2	<0.42	<2.1	<0.42	<0.85	<0.42	<0.42	<0.42	<0.42	<0.85	<0.85	<0.85	<0.42	<0.85	<0.85	<0.42	<0.42	<0.42	<0.42	<0.85	<1.1	<0.059
DG-AQ11	5	3.5-4	DG-AQ11S-3.5-4	1/30/2019	<0.47	<4.7	<0.94	<0.94	<4.7	<0.47	<2.3	<0.47	<0.94	<0.47	<0.47	<0.47	<0.47	<0.94	<0.94	<0.94	<0.47	<0.94	<0.94	<0.47	<0.47	<0.47	<0.47	<0.94	<1.2	<0.066
DG-AT9	5	0.5-1	DG-AT9S-0.5-1	1/30/2019	<0.47	<4.7	<0.94	<0.94	<4.7	<0.47	<2.4	<0.47	<0.94	<0.47	<0.47	<0.47	<0.47	<0.94	<0.94	<0.94	<0.47	<0.94	<0.94	<0.47	<0.47	<0.47	<0.47	<0.94	<1.2	<0.066
DG-AT9	5	3.5-4	DG-AT9S-3.5-4	1/30/2019	<0.39	<3.9	<0.78	<0.78	<3.9	<0.39	<2.0	**1.1**	<0.78	<0.39	<0.39	<0.39	<0.39	<0.78	<0.78	<0.78	<0.39	<0.78	<0.78	<0.39	**0.52 J**	<0.39	<0.39	<0.78	<1.0	<0.055
DG-AV9	5	0.5-1	DG-AV9S-0.5-1	2/1/2019	<0.85	<8.5	<1.7	<1.7	<8.5	<0.85	<4.2	<0.85	<1.7	<0.85	<0.85	<0.85	<0.85	<1.7	<1.7	<1.7	<0.85	<1.7	<1.7	<0.85	<0.85	<0.85	<0.85	<1.7	<2.2	<0.12
DG-AV9	5	3.5-4	DG-AV9S-3.5-4	2/1/2019	<0.60	<6.0	<1.2	<1.2	<6.0	<0.60	<3.0	<0.60	<1.2	<0.60	<0.60	<0.60	<0.60	<1.2	<1.2	<1.2	<0.60	<1.2	<1.2	<0.60	<0.60	<0.60	<0.60	<1.2	<1.5	<0.083
DG-AV9	5	8.5-9	DG-AV9S-8.5-9	2/1/2019	<0.44	<4.4	<0.88	<0.88	<4.4	<0.44	<2.2	<0.44	<0.88	<0.44	<0.44	<0.44	<0.44	<0.88	<0.88	<0.88	<0.44	<0.88	<0.88	<0.44	<0.44	<0.44	<0.44	<0.88	<1.1	<0.062

Table 5: Volatile Organic Compounds and Total Petroleum Hydrocarbons as Gasoline
Concentrations in Soil
Brisbane Baylands OU-2
Brisbane, California

Sample Location	Investigation Zone	Depth Range (ft bgs)	Sample Name	Collection Date	1,1,1-Trichloroethane	1,1,2-Trichloro-1,2,2-trifluoroethane	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	2-Butanone	4-Isopropyltoluene	4-Methyl-2-pentanone	Benzene	Carbon disulfide	Chloroform	cis-1,2-Dichloroethene	Ethylbenzene	Isopropylbenzene	Methyl-tert-butyl ether (MTBE)	Naphthalene	n-Butylbenzene	n-Propylbenzene	sec-Butylbenzene	tert-Butylbenzene	Tetrachloroethene (PCE)	Toluene	trans-1,2-Dichloroethene	Trichloroethene (TCE)	Vinyl Chloride	Xylenes, Total	TPH-Gasoline (C4-C12)
Direct Exposure Human Health Risk Level Residential Soil Exposure ESL [1]					1.7E+06	--	--	--	--	--	--	3.3E+02	--	3.2E+02	1.9E+04	5.9E+03	--	4.7E+04	3.8E+03	--	--	--	--	5.9E+02	1.1E+06	1.3E+05	9.5E+02	8.3E+00	5.8E+05	4.3E+05
Leaching to Groundwater Levels Non-drinking Water ESL [2]					7.0E+03	--	--	--	--	--	--	2.5E+01	--	2.3E+01	1.6E+03	4.3E+02	--	2.5E+03	1.2E+03	--	--	--	--	8.0E+01	1.0E+04	1.4E+04	8.5E+01	1.5E+00	1.0E+04	4.9E+03
USEPA RSL for Resident Soil [3]					8.1E+06	6.7E+06	3.0E+05	2.7E+05	2.7E+07	--	3.3E+07	1.2E+03	7.7E+05	3.2E+02	1.6E+05	5.8E+03	1.9E+06	4.7E+04	3.8E+03	3.9E+06	3.8E+06	7.8E+06	7.8E+06	2.4E+04	4.9E+06	1.6E+06	9.4E+02	5.9E+01	5.8E+05	--
Units					µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	mg/kg
DG-AW7	5	0.5-1	DG-AW7S-0.5-1	1/11/2019	<0.40	<4.0	<0.79	<0.79	<4.0	<0.40	<2.0	**0.47 J**	<0.79	<0.40	<0.40	<0.40	<0.40	<0.79	<0.79	<0.79	<0.40	<0.79	<0.79	<0.40	<0.40	<0.40	<0.40	<0.79	<1.0	<0.055
DG-AW7	5	3.5-4	DG-AW7S-3.5-4	1/11/2019	<0.44	<4.4	<0.88	<0.88	<4.4	<0.44	<2.2	<0.44	<0.88	<0.44	<0.44	<0.44	<0.44	<0.88	<0.88	<0.88	<0.44	<0.88	<0.88	<0.44	<0.44	<0.44	<0.44	<0.88	<1.1	<0.062
DG-AX9	5	0.5-1	DG-AX9S-0.5-1	1/23/2019	<0.34	<3.4	<0.68	<0.68	**10**	<0.34	<1.7	<0.34	<0.68	<0.34	<0.34	<0.34	<0.34	<0.68	<0.68	<0.68	<0.34	<0.68	<0.68	<0.34	<0.34	<0.34	<0.34	<0.68	<0.89	<0.048
DG-AX9	5	3.5-4	DG-AX9S-3.5-4	1/23/2019	<0.43	<4.3	<0.85	<0.85	**7.5 J**	<0.43	<2.1	<0.43	<0.85	<0.43	<0.43	<0.43	<0.43	<0.85	<0.85	<0.85	<0.43	<0.85	<0.85	<0.43	<0.43	<0.43	<0.43	<0.85	<1.1	<0.060
DG-AX9	5	9.5-10	DG-AX9S-9.5-10	1/23/2019	<0.47	<4.7	<0.93	<0.93	<4.7	<0.47	<2.3	<0.47	<0.93	<0.47	<0.47	<0.47	<0.47	<0.93	<0.93	<0.93	<0.47	<0.93	<0.93	<0.47	<0.47	<0.47	<0.47	<0.93	<1.2	<0.065
DG-AB17	6	0.5-1	DG-AB17S-0.5-1	1/24/2019	<37	<150	**55 J**	**42 J**	<370	<37	**4,000**	<37	<93	<37	<37	**240**	**49 J**	<75	<75	<75	<37	<37	<75	<37 U	<37	<37	<37	<75	**3,100**	**11**
DG-AB17	6	3.5-4	DG-AB17S-3.5-4	1/24/2019	<0.59	<5.9	<1.2	<1.2	**16**	<0.59	<3.0	<0.59	<1.2	<0.59	<0.59	<0.59	<0.59	<1.2	<1.2	<1.2	<0.59	<1.2	<1.2	<0.59	<0.59	<0.59	<0.59	<1.2	<1.5	<0.083
DG-AC15	6	0.5-1	DG-AC15S-0.5-1	1/31/2019	<0.38	<3.8	<0.76	<0.76	<3.8	<0.38	<1.9	<0.38	<0.76	<0.38	<0.38	<0.38	<0.38	<0.76	<0.76	<0.76	<0.38	<0.76	<0.76	<0.38	<0.38	<0.38	<0.38	<0.76	<0.99	<0.053
DG-AC15 (D)	6	0.5-1	DG-AC15 (D)S-0.5-1	1/31/2019	<0.37	<3.7	<0.74	<0.74	<3.7	<0.37	<1.9	<0.37	<0.74	<0.37	<0.37	<0.37	<0.37	<0.74	<0.74	<0.74	<0.37	<0.74	<0.74	<0.37	<0.37	<0.37	<0.37	<0.74	<0.97	<0.052
DG-AC15	6	3.5-4	DG-AC15S-3.5-4	1/31/2019	<0.39	<3.9	<0.78	<0.78	<3.9	<0.39	<2.0	<0.39	<0.78	<0.39	<0.39	<0.39	<0.39	<0.78	<0.78	<0.78	<0.39	<0.78	<0.78	<0.39	<0.39	<0.39	<0.39	<0.78	<1.0	<0.055
DG-AC15	6	7.5-8	DG-AC15S-7.5-8	1/31/2019	<58	<230	**530**	**150**	<580	**180**	<230	<58	<150	<58	<58	**76 J**	**64 J**	<120	**1,400**	**130 J**	**91 J**	**67 J**	<120	<58	<58	<58	<58	<120	**370**	**97**
DG-AD17	6	0.5-1	DG-AD17S-0.5-1	1/24/2019	<0.42	<4.2	<0.84	<0.84	<4.2	<0.42	<2.1	<0.42	<0.84	<0.42	<0.42	<0.42	<0.42	<0.84	<0.84	<0.84	<0.42	<0.84	<0.84	<0.42	<0.42	<0.42	<0.42	<0.84	<1.1	<0.059
DG-AD17	6	3.5-4	DG-AD17S-3.5-4	1/24/2019	<76	<310	<76	<76	<760	<76	<310	<76	<190	<76	<76	<76	<76	<150	<150	<150	<76	<76	<150	<76	<76	<76	<76	<150	<150	**130**
DG-AD17	6	7-7.5	DG-AD17S-7-7.5	1/24/2019	<0.37	<3.7	<0.75	<0.75	<3.7	<0.37	<1.9	<0.37	<0.75	<0.37	<0.37	<0.37	<0.37	<0.75	**3.3**	<0.75	<0.37	<0.75	<0.75	<0.37	<0.37	<0.37	<0.37	<0.75	<0.97	**0.079**
DG-AG15	6	0.5-1	DG-AG15S-0.5-1	1/24/2019	<0.36	<3.6	<0.73	<0.73	<3.6	**0.46 J**	<1.8	<0.36	<0.73	<0.36	<0.36	<0.36	<0.36	<0.73	<0.73	<0.73	<0.36	<0.73	<0.73	<0.36	<0.36	<0.36	<0.36	<0.73	<0.94	<0.051
DG-AG15	6	3.5-4	DG-AG15S-3.5-4	1/24/2019	<0.32	<3.2	<0.64	<0.64	**4.2 J**	<0.32	<1.6	<0.32	<0.64	<0.32	<0.32	<0.32	<0.32	<0.64	<0.64	<0.64	<0.32	<0.64	<0.64	<0.32	<0.32	<0.32	<0.32	<0.64	<0.83	<0.045
DG-AG15	6	8.5-9	DG-AG15S-8.5-9	1/24/2019	<0.43	<4.3	**2.9**	**1.0 J**	**27**	**0.44 J**	<2.1	**15**	**3.7**	<0.43	<0.43	**2.1**	**3.4**	<0.86	**0.87 J**	**2.4**	**12**	<0.86	<0.86	<0.43	**1.1**	<0.43	<0.43	<0.86	**3.6**	**0.23**
DG-AH17	6	0.5-1	DG-AH17S-0.5-1	1/24/2019	<0.33	<3.3	<0.67	<0.67	<3.3	**130**	<1.7	<0.33	<0.67	<0.33	<0.33	<0.33	<0.33	<0.67	<0.67	<0.67	<0.33	<0.67	<0.67	<0.33	**0.33 J**	<0.33	<0.33	<0.67	<0.87	**0.43**
DG-AI15	6	0.5-1	DG-AI15S-0.5-1	1/24/2019	<0.33	<3.3	<0.66	<0.66	<3.3	<0.33	<1.6	<0.33	<0.66	<0.33	<0.33	<0.33	<0.33	<0.66	<0.66	<0.66	<0.33	<0.66	<0.66	<0.33	<0.33	<0.33	<0.33	<0.66	<0.85	<0.046
DG-AI15	6	3.5-4	DG-AI15S-3.5-4	1/24/2019	<0.35	<3.5	<0.71	<0.71	<3.5	<0.35	<1.8	<0.35	<0.71	<0.35	<0.35	<0.35	<0.35	**2.2**	<0.71	<0.71	<0.35	<0.71	<0.71	<0.35	<0.35	<0.35	<0.35	<0.71	<0.92	<0.049
DG-AI15 (D)	6	3.5-4	DG-AI15 (D)S-3.5-4	1/24/2019	<0.35	<3.5	<0.70	<0.70	<3.5	<0.35	<1.8	<0.35	<0.70	<0.35	<0.35	<0.35	<0.35	**2.4**	<0.70	<0.70	<0.35	<0.70	<0.70	<0.35	<0.35	<0.35	<0.35	<0.70	<0.91	<0.049
DG-AJ17	6	0.5-1	DG-AJ17S-0.5-1	1/24/2019	<0.35	<3.5	<0.69	<0.69	<3.5	<0.35	<1.7	<0.35	<0.69	<0.35	<0.35	<0.35	<0.35	<0.69	<0.69	<0.69	<0.35	<0.69	<0.69	<0.35	<0.35	<0.35	<0.35	<0.69	<0.90	<0.049
DG-AJ17	6	3.5-4	DG-AJ17S-3.5-4	1/24/2019	<0.36	<3.6	<0.73	<0.73	<3.6	<0.36	<1.8	<0.36	<0.73	<0.36	<0.36	<0.36	<0.36	<0.73	<0.73	<0.73	<0.36	<0.73	<0.73	<0.36	<0.36	<0.36	<0.36	<0.73	<0.94	<0.051
DG-AJ17	6	9.5-10	DG-AJ17S-9.5-10	1/24/2019	<0.33	<3.3	<0.66	<0.66	<3.3	<0.33	<1.7	<0.33	<0.66	<0.33	<0.33	<0.33	<0.33	<0.66	<0.66	<0.66	<0.33	<0.66	<0.66	<0.33	<0.33	<0.33	<0.33	<0.66	<0.86	<0.046
DG-AK15	6	0.5-1	DG-AK15S-0.5-1	1/23/2019	<0.43	<4.3	<0.87	<0.87	<4.3	<0.43	<2.2	<0.43	<0.87	<0.43	<0.43	<0.43	<0.43	<0.87	<0.87	<0.87	<0.43	<0.87	<0.87	**3.9**	<0.43	<0.43	<0.43	<0.87	<1.1	<0.061
DG-AK15	6	3.5-4	DG-AK15S-3.5-4	1/23/2019	<0.39	<3.9	<0.79	<0.79	<3.9	<0.39	<2.0	<0.39	<0.79	<0.39	<0.39	<0.39	<0.39	<0.79	<0.79	<0.79	<0.39	<0.79	<0.79	**11**	<0.39	<0.39	<0.39	<0.79	<1.0	<0.055
DG-AM15	6	0.5-1	DG-AM15S-0.5-1	1/23/2019	<0.47	**7.5 J**	<0.94	<0.94	<4.7	<0.47	<2.3	<0.47	<0.94	<0.47	<0.47	<0.47	<0.47	<0.94	<0.94	<0.94	<0.47	<0.94	<0.94	<0.47	<0.47	<0.47	<0.47	<0.94	<1.2	<0.066
DG-AM15	6	3.5-4	DG-AM15S-3.5-4	1/23/2019	<0.42	<4.2	<0.85	<0.85	<4.2	<0.42	<2.1	<0.42	<0.85	<0.42	<0.42	<0.42	<0.42	<0.85	<0.85	<0.85	<0.42	<0.85	<0.85	<0.42	<0.42	<0.42	<0.42	<0.85	<1.1	<0.059
DG-AM15	6	9.5-10	DG-AM15S-9.5-10	1/23/2019	<0.43	<4.3	<0.86	<0.86	<4.3	<0.43	<2.1	<0.43	**3.3 J**	<0.43	<0.43	<0.43	<0.43	<0.86	<0.86	<0.86	<0.43	<0.86	<0.86	<0.43	<0.43	<0.43	<0.43	<0.86	<1.1	<0.060
DG-AM15 (D)	6	9.5-10	DG-AM15 (D)S-9.5-10	1/23/2019	<0.58	<5.8	<1.2	<1.2	<5.8	<0.58	<2.9	<0.58	<1.2 UJ	<0.58	<0.58	<0.58	<0.58	<1.2	<1.2	<1.2	<0.58	<1.2	<1.2	<0.58	<0.58	<0.58	<0.58	<1.2	<1.5	<0.081
DG-AP13	6	0.5-1	DG-AP13S-0.5-1	1/23/2019	<0.33	<3.3	<0.66	<0.66	<3.3	<0.33	<1.7	<0.33	<0.66	<0.33	<0.33	<0.33	<0.33	<0.66	<0.66	<0.66	<0.33	<0.66	<0.66	<0.33	<0.33	<0.33	<0.33	<0.66	<0.86	<0.046
DG-AP13 (D)	6	0.5-1	DG-AP13 (D)S-0.5-1	1/23/2019	<0.38	<3.8	<0.75	<0.75	<3.8	<0.38	<1.9	<0.38	<0.75	<0.38	<0.38	<0.38	<0.38	<0.75	<0.75	<0.75	<0.38	<0.75	<0.75	<0.38	<0.38	<0.38	<0.38	<0.75	<0.98	<0.053
DG-AP13	6	3.5-4	DG-AP13S-3.5-4	1/23/2019	<0.36	<3.6	<0.73	<0.73	<3.6	<0.36	<1.8	<0.36	<0.73	<0.36	<0.36	<0.36	<0.36	<0.73	<0.73	<0.73	<0.36	<0.73	<0.73	<0.36	<0.36	<0.36	<0.36	<0.73	<0.94	<0.051
DG-AP13	6	9.5-10	DG-AP13S-9.5-10	1/23/2019	<0.46	<4.6	<0.91	<0.91	<4.6	<0.46	<2.3	**3.9**	<0.91	<0.46	<0.46	<0.46	<0.46	<0.91	<0.91	<0.91	<0.46	<0.91	<0.91	**0.64 J**	**1.7**	<0.46	<0.46	<0.91	<1.2	<0.064
DG-AR13	6	0.5-1	DG-AR13S-0.5-1	1/23/2019	<0.41	<4.1	<0.83	<0.83	<4.1	<0.41	<2.1	<0.41	<0.83	<0.41	<0.41	<0.41	<0.41	<0.83	<0.83	<0.83	<0.41	<0.83	<0.83	<0.41	<0.41	<0.41	<0.41	<0.83	<1.1	<0.058
DG-AR13	6	3.5-4	DG-AR13S-3.5-4	1/23/2019	<0.38	<3.8	<0.76	<0.76	<3.8	<0.38	<1.9	<0.38	<0.76	<0.38	<0.38	<0.38	<0.38	<0.76	<0.76	<0.76	<0.38	<0.76	<0.76	<0.38	<0.38	<0.38	<0.38	<0.76	<0.99	<0.054
DG-AR13	6	9.5-10	DG-AR13S-9.5-10	1/23/2019	<0.50	<5.0	<0.99	<0.99	<5.0	<0.50	<2.5	**7.1**	<0.99	<0.50	<0.50	<0.50	<0.50	<0.99	<0.99	<0.99	<0.50	<0.99	<0.99	<0.50	**2**	<0.50	<0.50	<0.99	<1.3	<0.069
DG-AS11	6	0.5-1	DG-AS11S-0.5-1	1/31/2019	<0.41	<4.1	<0.83	<0.83	<4.1	<0.41	<2.1	<0.41	<0.83	<0.41	<0.41	<0.41	<0.41	<0.83	<0.83	<0.83	<0.41	<0.83	<0.83	<0.41	<0.41	<0.41	<0.41	<0.83	<1.1	<0.058
DG-AS11	6	3.5-4	DG-AS11S-3.5-4	1/31/2019	<0.51	<5.1	<1.0	<1.0	<5.1	<0.51	<2.6	<0.51	<1.0	<0.51	<0.51	<0.51	<0.51	<1.0	<1.0	<1.0	<0.51	<1.0	<1.0	<0.51	<0.51	<0.51	<0.51	<1.0	<1.3	<0.072
DG-AS11	6	7.5-8	DG-AS11S-7.5-8	1/31/2019	<0.39	<3.9	<0.78	<0.78	<3.9	<0.39	<1.9	<0.39	<0.78	<0.39	<0.39	<0.39	<0.39	<0.78	<0.78	<0.78	<0.39	<0.78	<0.78	<0.39	<0.39	<0.39	<0.39	<0.78	<1.0	<0.054
DG-AT12	6	0.5-1	DG-AT12S-0.5-1	1/23/2019	<0.47	<4.7	<0.95	<0.95	<4.7	<0.47	<2.4	**1**	<0.95	<0.47	<0.47	<0.47	<0.47	<0.95	<0.95	<0.95	<0.47	<0.95	<0.95	<0.47	**1.7**	<0.47	<0.47	<0.95	<1.2	**0.18**
DG-AT12	6	3.5-4	DG-AT12S-3.5-4	1/23/2019	<0.57	<5.7	<1.1	<1.1	<5.7	<0.57	<2.9	<0.57	<1.1	**1.4**	<0.57	<0.57	<0.57	<1.1	<1.1	<1.1	<0.57	<1.1	<1.1	<0.57	<0.57	<0.57	<0.57	<1.1	<1.5	<0.080
DG-AT12	6	9.5-10	DG-AT12S-9.5-10	1/23/2019	<0.45	<4.5	<0.90	<0.90	<4.5	<0.45	<2.2	<0.45	<0.90	<0.45	<0.45	<0.45	<0.45	<0.90	<0.90	<0.90	<0.45	<0.90	<0.90	<0.45	<0.45	<0.45	<0.45	<0.90	<1.2	<0.063
DG-AU11	6	0.5-1	DG-AU11S-0.5-1	1/23/2019	<0.37	<3.7	<0.75	<0.75	<3.7	<0.37	<1.9	<0.37	<0.75	<0.37	<0.37	<0.37	<0.37	<0.75	<0.75	<0.75	<0.37	<0.75	<0.75	<0.37	<0.37	<0.37	<0.37	<0.75	<0.97	<0.052
DG-AU11	6	3.5-4	DG-AU11S-3.5-4	1/23/2019	<0.35	<3.5	<0.70	<0.70	**5.3 J**	<0.35	<1.8	<0.35	<0.70	<0.35	<0.35	<0.35	<0.35	<0.70	<0.70	<0.70	<0.35	<0.70	<0.70	<0.35	<0.35	<0.35	<0.35	<0.70	<0.91	<0.049
DG-AU11	6	9.5-10	DG-AU11S-9.5-10	1/23/2019	<0.44	<4.4	<0.89	<0.89	**5.6 J**	<0.44	<2.2	**2.3**	<0.89	<0.44	<0.44	<0.44	<0.44	<0.89	<0.89	<0.89	<0.44	<0.89	<0.89	<0.44	**0.62 J**	<0.44	<0.44	<0.89	<1.2	<0.062
DG-AW11	6	0.5-1	DG-AW11S-0.5-1	1/23/2019	<0.40	<4.0	<0.80	<0.80	**32**	<0.40	<2.0	<0.40	**1.7**	<0.40	<0.40	<0.40	<0.40	<0.80	<0.80	<0.80	<0.40	<0.80	<0.80	<0.40	<0.40	<0.40	<0.40	<0.80	<1.0	<0.056
DG-AW11	6	3.5-4	DG-AW11S-3.5-4	1/23/2019	<0.43 R	<4.3 R	<0.86 R	<0.86 R	**77 J**	<0.43 R	<2.2 R	<0.43 R	<0.86 R	<0.43 R	<0.43 R	<0.43 R	<0.43 R	<0.86 R	<0.86 R	<0.86 R	<0.43 R	<0.86 R	<0.86 R	<0.43 R	<0.43 R	<0.43 R	<0.43 R	<0.86 R	<1.1 R	<0.060
DG-AW11	6	7.5-8	DG-AW11S-7.5-8	1/23/2019	<0.41	<4.1	<0.83	<0.83	**75**	<0.41	<2.1	<0.41	**2**	<0.41	<0.41	<0.41	<0.41	<0.83	<0.83	<0.83	<0.41	<0.83	<0.83	<0.41	<0.41	<0.41	<0.41	<0.83	<1.1	<0.058
Historical Samples																														
C-34	4	3-4	C-34-3-4	8/30/06	<5	<5	--	--	--	--	--	<5	--	**7.7**	<5	<5	--	--	--	--	--	--	--	**15**	<5	<5	<5	<5	<10	--
C-34	4	7.5-8	C-34-7.5-8	8/30/06	<5	<5	--	--	--	--	--	<5	--	**7.7**	<5	**5.3**	--	--	--	--	--	--	--	<5	<5	<5	<5	<5	**31**	--
C-35	4	4.5-5	C-35-4.5-5	8/30/06	<500	<500	--	--	--	--	--	<500	--	<500	**3,200**	<500	--	--	--	--	--	--	--	<500	<500	<500	<500	**2,300**	<1,000	--
C-35	4	5.5-6	C-35-5.5-6	8/30/06	<2,500	<2,500	--	--	--	--	--	<2,500	--	<2,500	<2,500	<2,500	--	--	--	--	--	--	--	<2,500	<2,500	<2,500	<2,500	<2,500	<5,000	--
C-36	6	6-6.5	C-36-6-6.5	8/30/06	<2,500	<2,500	--	--	--	--	--	<2,500	--	<2,500	**27,000**	<2,500	--	--	--	--	--	--	--	**4,400**	<2,500	<2,500	<2,500	<2,500	<5,000	--
C-36	6	8-8.5	C-36-8-8.5	8/30/06	<2,500	<2,500	--	--	--	--	--	<2,500	--	<2,500	**12,000**	<2,500	--	--	--	--	--	--	--	**4,400**	<2,500	**2,800**	<2,500	<2,500	**7,100**	--

Table 5: Volatile Organic Compounds and Total Petroleum Hydrocarbons as Gasoline
Concentrations in Soil
Brisbane Baylands OU-2
Brisbane, California

Sample Location	Investigation Zone	Depth Range (ft bgs)	Sample Name	Collection Date	1,1,1-Trichloroethane	1,1,2-Trichloro-1,2,2-trifluoroethane	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	2-Butanone	4-Isopropyltoluene	4-Methyl-2-pentanone	Benzene	Carbon disulfide	Chloroform	cis-1,2-Dichloroethene	Ethylbenzene	Isopropylbenzene	Methyl-tert-butyl ether (MTBE)	Naphthalene	n-Butylbenzene	n-Propylbenzene	sec-Butylbenzene	tert-Butylbenzene	Tetrachloroethene (PCE)	Toluene	trans-1,2-Dichloroethene	Trichloroethene (TCE)	Vinyl Chloride	Xylenes, Total	TPH-Gasoline (C4-C12)
Direct Exposure Human Health Risk Level Residential Soil Exposure ESL [1]					1.7E+06	--	--	--	--	--	--	3.3E+02	--	3.2E+02	1.9E+04	5.9E+03	--	4.7E+04	3.8E+03	--	--	--	--	5.9E+02	1.1E+06	1.3E+05	9.5E+02	8.3E+00	5.8E+05	4.3E+05
Leaching to Groundwater Levels Non-drinking Water ESL [2]					7.0E+03	--	--	--	--	--	--	2.5E+01	--	2.3E+01	1.6E+03	4.3E+02	--	2.5E+03	1.2E+03	--	--	--	--	8.0E+01	1.0E+04	1.4E+04	8.5E+01	1.5E+00	1.0E+04	4.9E+03
USEPA RSL for Resident Soil [3]					8.1E+06	6.7E+06	3.0E+05	2.7E+05	2.7E+07	--	3.3E+07	1.2E+03	7.7E+05	3.2E+02	1.6E+05	5.8E+03	1.9E+06	4.7E+04	3.8E+03	3.9E+06	3.8E+06	7.8E+06	7.8E+06	2.4E+04	4.9E+06	1.6E+06	9.4E+02	5.9E+01	5.8E+05	--
Units					µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	mg/kg
C-37	6	4.5-5	C-37-4.5-5	8/30/06	<25	<25	--	--	--	--	--	<25	--	<25	**830**	<25	--	--	--	--	--	--	--	<25	<25	**160**	<25	**84**	<50	--
C-37	6	6.5-7	C-37-6.5-7	8/30/06	<500	<500	--	--	--	--	--	<500		<500	**630**	<500	--	--	--	--	--	--	--	**20,000**	<500	<500	**930**	<500	<1,000	--
C-38	4	4.5-5	C-38-4.5-5	8/30/06	<25,000	<25,000	--	--	--	--	--	<25,000	--	<25,000	**490,000**	<25,000	--	--	--	--	--	--	--	**310,000**	<25,000	<25,000	**40,000**	<25,000	<50,000	--
C-38	4	5.5-6	C-38-5.5-6	8/30/06	<25,000	<25,000	--	--	--	--	--	<2,500	--	<2,500	**80,000**	<2,500	--	--	--	--	--	--	--	**21,000**	<2,500	<2,500	<2,500	**3,100**	<5,000	--
C-39	6	3.5-4	C-39-3.5-4	8/30/06	<250,000	<250,000	--	--	--	--	--	<250,000	--	<250,000	**460,000 J**	<250,000	--	--	--	--	--	--	--	**4,200,000 J**	<250,000	<250,000	<250,000	<250,000	<500,000	--
C-39	6	4.5-5	C-39-4.5-5	8/30/06	<250,000	<250,000	--	--	--	--	--	<2,500	--	<250,000	**960,000**	<250,000	--	--	--	--	--	--	--	**9,400,000**	<250,000	<250,000	**860,000**	<250,000	<500,000	--
R-25	6	3.2-3.7	R-25-3.2-3.7	6/06/00	<130,000	<130,000	<130,000	<130,000	<130,000	<130,000	<130,000	<130,000	<130,000	<130,000	<130,000	<130,000	<130,000	<130,000	<130,000	<130,000	<130,000	<130,000	<130,000	**2,500,000**	<130,000	<130,000	**170,000**	<130,000	<260,000	--
S-9	4	5-5.5	S-9-5-5.5	11/08/00	<17,000	<17,000	<17,000	<17,000	<17,000	<17,000	<17,000	<17,000	<17,000	<17,000	**240,000**	<17,000	<17,000	<17,000	<10,000	<17,000	<17,000	<17,000	<17,000	**650,000**	<17,000	<17,000	**100,000**	<33,000	<34,000	--
S-10	6	5.5-6	S-10-5.5-6	11/08/00	<4.8	<4.8	<4.8	<4.8	<4.8	<4.8	<4.8	<4.8	<4.8	<4.8	**5.3**	<4.8	<4.8	<4.8	<4.8	<4.8	<4.8	<4.8	<4.8	<4.8	<4.8	<4.8	<4.8	**9.7**	<4.8	--
S-11	6	0.5-1	S-11-0.5-1	11/08/00	<170,000	<170,000	<170,000	<170,000	<170,000	<170,000	<170,000	<170,000	<170,000	<170,000	<170,000	<170,000	<170,000	<170,000	<170,000	<170,000	<170,000	<170,000	<170,000	**4,500,000**	<170,000	<170,000	<170,000	<330,000	<340,000	--
S-19	4	7.5-8	S-19-7.5-8	6/19/01	--	--	--	--	--	--	--	--	--	--	<4.8	--	--	--	--	--	--	--	--	**5.8**	--	--	<4.8	<9.6	--	--

Notes:

1. San Francisco Bay RWQCB, 2019. Summary of Soil ESLs, Jan. 2019 (Rev. 1) - Direct Exposure Human Health Risk Levels (Table S-1) Res: Shallow Soil Exposure.
2. San Francisco Bay RWQCB, 2019. Summary of Soil ESLs, Jan. 2019 (Rev. 1) - Leaching to Groundwater Levels (Table S-3) Non-drinking Water.
3. USEPA, 2018. Regional Screening Levels - Generic Tables (April 2019). Screening level for "Resident Soil."

- The RWQCB ESL is used as comparison criteria when available. If RWQCB ESLs are not available, EPA RSL was selected for use as comparison criteria.
- VOCs and TPH-gasoline were analyzed by USEPA Method 8260B.
- Only analytes with detections are included in this table.
- Non-detect results are presented with "<" followed by the MDL.
- Results in bold font indicate a detection above the MDL.
- Gray shading indicates a detection above the comparison criteria.

Abbreviations and Symbols:

"F1" - Matrix spike and/or matrix spike duplicate recovery is outside of acceptance limits.
"F2" - Matrix spike and/or matrix spike duplicate relative percent difference exceeds control limits.
"J" - Analyte was detected but the associated numerical value is the approximate concentration.
"J+" - Analyte was detected but the associated numerical value is likely to be higher than the concentration of the analyte in the sample due to positive bias of associated QC or calibration data or attributable to matrix interference.
"J-" - Analyte was detected but the associated numerical value is likely to be lower than the concentration of the analyte in the sample due to negative bias of associated QC or calibration data or attributable to matrix interference.
"U" - Not detected at or above the reported result.
"UJ" - The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
"R" - The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.
"--" - Not Available
"<" - Non-detect result
(D) - Duplicate sample
µg/kg - microgram per kilogram
ESL - Environmental Screening Level
ft bgs - Feet below ground surface
MDL - Method Detection Limit
mg/kg - milligram per kilogram
QC - quality control
RWQCB - Regional Water Quality Control Board
TPH - Total petroleum hydrocarbons
USEPA - United States Environmental Protection Agency
VOCs - volatile organic compounds

Table 6: Groundwater Elevations in Fill Water-Bearing Zone, December 2018

Brisbane Baylands OU-2
Brisbane, California

Well Name	Screened Interval (ft bgs)	Date	Top of Casing Elevation (ft MSL)[1,2]	Depth to Groundwater (ft bgs)	Groundwater Elevation (ft MSL)[1,2]
KMW-4A	2-11	12/18/2018	10.46	4.66	5.80
KMW-7A	2-11	12/18/2018	13.66	7.92	5.74
LF-3A	4-10	12/18/2018	10.95	5.02	5.93
LF-4A	4-14	12/18/2018	8.32	2.32	6.00
LF-5A	2.5-8	12/18/2018	8.49	2.78	5.71
LF-7A	4-8	12/18/2018	10.65	5.45	5.20
LF-8A	5-10	12/18/2018	9.36	4.03	5.33
MK-1A	3-13	12/18/2018	10.47	4.70	5.77
MK-2A	3-13	12/18/2018	12.81	4.49	8.32
MK-7A	3-10	12/18/2018	10.50	5.36	5.14
MK-8A	5-10	12/18/2018	16.58	10.55	6.03
MW-9A	3-13	12/18/2018	11.26	5.62	5.64
MW-10A	3-13	12/18/2018	9.59	4.89	4.70
MW-11AR	3-13	12/18/2018	14.19	9.61	4.58
MW-13A	3-13	12/18/2018	7.81	3.89	3.92
MW-15A	3-13	12/18/2018	8.67	3.77	4.90
MW-17A	3-13	12/18/2018	8.45	2.56	5.89

Notes:

1. Source: Levine-Fricke, 1990. *Supplemental Remedial Investigation Data Study Report*, The Bayshore Railyard, Brisbane, California. 18 July.
2. Elevations were measured during well installation and may have changed since the time of measurement.

Abbreviations and Symbols:

bgs - below ground surface
ft - feet
MSL - Mean Sea Level

Table 7: Dissolved Metals Concentrations in Fill Groundwater
Brisbane Baylands OU-2
Brisbane, California

Sample Location	Investigation Zone	Sample Name	Collection Date	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Chromium, Hexavalent	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
Aquatic Habitat Goal Saltwater Ecotox ESL [1]				5.0E+02	3.6E+01	--	--	9.3E+00	1.0E+03	5.0E+01	--	3.1E+00	8.1E+00	2.5E-02	--	8.2E+00	5.0E-01	1.9E-01	2.1E+02	--	8.1E+01
Site Specific Screening Level [2]				5.0E+04	3.6E+03	--	--	9.3E+02	1.0E+05	5.0E+03	--	3.1E+02	8.1E+02	2.5E+00	--	8.2E+02	5.0E+01	1.9E+01	2.1E+04	--	8.1E+03
Units				µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
DG-N1	1	DG-N1W	12/18/2018	<4.1	**12**	**51**	<0.59	<0.21	**0.85**	<3.7	**5**	**5.1**	**7.5**	<0.10	**4.6**	**8.4**	<4.6	<2.0	<3.5	**1**	<7.4
DG-N5	1	DG-N5W	1/10/2019	**4.4 J**	**63**	**220**	<0.59	**0.56 J**	**0.78 J**	<3.7	**3.2**	**13 J**	<2.2	<0.10	**19**	**2.8 J**	<4.6	<2.0	<3.5	**1.1 J**	**20**
DG-O3	1	DG-O3W	12/18/2018	<4.1	**36**	**40**	<0.59	<0.21	**0.93**	<3.7	**1.6**	<3.7	**6.8**	<0.10	**7.1**	**2.1**	<4.6	<2.0	<3.5	**1.5**	<7.4
DG-P5	1	DG-P5W	1/10/2019	<4.1	**56**	**180**	<0.59	<0.21	**0.81 J**	<3.7	**1.6 J**	**5.4 J**	<2.2	<0.10	**10**	<1.0	<4.6	<2.0	**8.1 J**	<0.87	<7.4
DG-Q7	1	DG-Q7W	1/10/2019	<4.1	**10 U**	**980**	<0.59	<0.21	**1.1 J**	<3.7	<0.68	<3.7	**3.2 J**	<0.10	<2.9 UJ	<1.0 UJ	<4.6	<2.0	**4.4 J**	<0.87	**27**
DG-Q7 (D)	1	DG-Q7 (D)W	1/10/2019	<4.1	**4.0 J**	**1,000 J**	<0.59	<0.21	**1.0 J**	<3.7	<0.68	<3.7	<2.2 UJ	<0.10	**2.9 J**	**1.1 J**	<4.6	<2.0	<3.5 UJ	<0.87	**28**
DG-R1	1	DG-R1W	12/17/2018	<4.1	**26**	**56**	<0.59	**0.23 J**	**0.81 J**	<3.7	**4.6**	**6.5 J**	**6.5**	<0.10	<2.9	**4.1 J**	<4.6	<2.0	<3.5	**1.0 J**	<7.4
DG-R5	1	DG-R5W	1/30/2019	**5.7 J**	**57**	**140**	<0.59	<0.21	<0.70	<3.7	**2.6**	<3.7	<2.2	<0.10	**14**	**1.7 J**	<4.6	<2.0	<3.5 R	<0.87	**14 J**
DG-S3	1	DG-S3W	12/18/2018	<4.1	**24**	**110**	<0.59	<0.21	**0.79**	<3.7	**1.6**	<3.7	**12**	<0.10	**8.7**	**1.4**	<4.6	<2.0	<3.5	**2**	<7.4
DG-S7	1	DG-S7W	1/10/2019	<4.1	**10 U**	**660**	<0.59	<0.21	<0.70	<3.7	<0.68	**4.6 J**	<2.2	<0.10	**12**	**1.5 J**	<4.6	<2.0	<3.5	<0.87	<7.4
DG-T1	1	DG-T1W	12/17/2018	<4.1	**9.5 J**	**48 J**	**1.1 J**	**0.90 J**	**2.0 J**	<3.7	**7.5**	**4.8 J**	**6.7**	<0.10	**4.1 J**	**7.1 J**	<4.6	<2.0 UJ	<3.5	**1.6 J**	<7.4
DG-T5	1	DG-T5W	1/7/2019	**9.2 J**	**120**	**310**	<0.59	<0.21	<0.70	<3.7	**1.5 J**	**8.0 J**	**14**	<0.10	**9.2 J**	<1.0	<4.6	<2.0	<3.5	**3.7 J**	**9.6 J**
DG-U3	1	DG-U3W	12/18/2018	<4.1	**36**	**14**	<0.59	<0.21	<0.70	<3.7	<0.68	<3.7	**5.4**	<0.10	**11**	**1.4**	<4.6	<2.0	<3.5	<0.87	<7.4
DG-U3 (D)	1	DG-U3 (D)W	12/18/2018	<4.1	**38**	**15**	<0.59	<0.21	<0.70	<3.7	<0.68	<3.7	**4.3**	<0.10	**11**	**1.2**	<4.6	<2.0	<3.5	<0.87	<7.4
DG-U7	1	DG-U7W	1/10/2019	<4.1	**17**	**1,000**	<0.59	<0.21	**0.73 J**	<3.7	<0.68	<3.7	<2.2	<0.10	**4.0 J**	<1.0	<4.6	<2.0	<3.5	<0.87	<7.4
DG-V1	1	DG-V1W	12/17/2018	<4.1	**12**	**49 J**	**0.61 J**	**0.41 J**	**1.4 J**	<3.7	**6.7**	<3.7	**7.4**	<0.10	<2.9	**6.4 J**	<4.6	<2.0	**3.7 J**	<0.87	<7.4
DG-V5	1	DG-V5W	1/7/2019	**12**	**610**	**120**	<0.59	<0.21	<0.70	<3.7	<0.68	**6.1 J**	**9.2**	<0.10	**3.7 J**	<1.0	<4.6	<2.0	<3.5	**7.2 J**	**17 J**
DG-V9	1	DG-V9W	1/14/2019	<4.1	**3.8 J**	**330**	<0.59	**1.2 J**	**0.92 J**	<3.7	**6.3**	**7.6 J**	<2.2	<0.10	<2.9	**9.4 J**	**5.2 J**	<2.0	**4.3 J**	<0.87	**310**
DG-W3	1	DG-W3W	12/18/2018	<4.1	**16**	**42**	<0.59	<0.21	<0.70	<3.7	**4.5**	**5.6**	**7.8**	<0.10	**3.1**	**4**	<4.6	<2.0	<3.5	<0.87	<7.4
DG-W7	1	DG-W7W	1/30/2019	<4.1	**4.3 J**	**210**	<0.59	<0.21	**0.89 J**	<3.7	**2.8**	<3.7	<2.2	<0.10	<2.9	**5.6 J**	<4.6	<2.0	<3.5 R	<0.87	**170**
DG-X1	1	DG-X1W	12/17/2018	<4.1	**11**	**59**	**0.59 J**	**0.72 J**	**1.7 J**	<3.7	**8.9**	**4.5 J**	**7.4**	<0.10	**5.3 J**	**9.2 J**	<4.6	<2.0	<3.5	**1.5 J**	<7.4
DG-X5	1	DG-X5W	1/7/2019	**12**	**65**	**260**	<0.59	<0.21	**1.6 J**	<3.7	**0.96 J**	**12 J**	**28**	<0.10	**11**	**1.3 J**	<4.6	<2.0	<3.5	**2.7 J**	**17 J**
DG-X9	1	DG-X9W	1/14/2019	<4.1	<2.9	**310**	<0.59	<0.21	**0.75 J**	<3.7	<0.68	<3.7	<2.2	**0.28**	<2.9	**1.4 J**	<4.6	<2.0	<3.5	<0.87	**20 U**
DG-Y3	1	DG-Y3W	12/18/2018	<4.1	**24**	**79**	<0.59	<0.21	<0.70	<3.7	**9.4**	<3.7	**9.5**	<0.10	<2.9	**7**	<4.6	<2.0	<3.5	<0.87	**8.7**
DG-Y7	1	DG-Y7W	1/11/2019	<4.1	**10 U**	**170**	<0.59	<0.21	<0.70	<3.7	**0.90 J**	**6.1 J**	<2.2	<0.10	<2.9	**2.0 J**	<4.6	<2.0	**9.5 J**	<0.87	**75**
DG-Z5	1	DG-Z5W	1/7/2019	<4.1	**22**	**120**	<0.59	<0.21	**1.4 J**	<3.7	**5.9**	<3.7	**9.2**	<0.10	**7.6 J**	**3.7 J**	<4.6	<2.0	<3.5	<0.87	<7.4
DG-Z9	1	DG-Z9W	1/15/2019	<4.1	**4.2 J**	**390**	<0.59	**0.47 J**	**2.1 J**	<3.7	**5.9**	**4.9 J**	**5.5**	<0.10	**13**	**7.5 J**	<4.6	<2.0	**19**	<0.87	**170**
DG-AA3	1	DG-AA3W	12/18/2018	<4.1	**27**	**310**	<0.59	<0.21	**1.3**	<3.7	**12**	**7.2**	**9.7**	<0.10	**4.9**	**14**	<4.6	<2.0	<3.5	**1.5**	<7.4
DG-AA7	1	DG-AA7W	1/11/2019	<4.1	**11**	**180**	<0.59	<0.21	<0.70	<3.7	**1.7 J**	**8.4 J**	**4.7 J**	<0.10	**4.9 J**	**2.1 J**	<4.6	<2.0	**5.5 J**	<0.87	**65**
DG-AB5	1	DG-AB5W	1/31/2019	<4.1	**39**	**69**	**1.2 J**	**0.88 J**	**1.2 J**	<3.7	**5.1**	**5.7 J**	**8.4**	<0.10	**5.3 J**	**3.8 J**	<4.6	<2.0 UJ	<3.5 R	<0.87	<7.4
DG-AB5 (D)	1	DG-AB5 (D)W	1/31/2019	<4.1	**49**	**70**	<0.59 UJ	<0.21 UJ	<0.70 UJ	<3.7	**4.2**	**6.5 J**	**8.2**	<0.10	**5.6 J**	**2.4 J**	<4.6	<2.0	<3.5 R	<0.87	<7.4
DG-AC3	1	DG-AC3W	12/19/2018	<4.1	**50**	**160**	<0.59	**0.21**	**3**	<3.7	**16**	**6**	**11**	<0.10	**5**	**17**	<4.6	<2.0	<3.5	**1.7**	**13**
DG-AC7	1	DG-AC7W	1/11/2019	**8.0 J**	**10 U**	**150**	<0.59	**0.32 J**	**1.3 J**	<3.7	**1.4 J**	**23**	<2.2 UJ	<0.10	**12**	**2.4 J**	<4.6	<2.0	**4.6 J**	<0.87 UJ	**43**
DG-AC7 (D)	1	DG-AC7 (D)W	1/11/2019	**5.9 J**	<2.9	**150**	<0.59	**0.38 J**	**10 U**	<3.7	**1.9 J**	**21**	**7.6 J**	<0.10	**11**	**2.6 J**	<4.6	<2.0	<3.5 UJ	**0.99 J**	**39**
DG-AD5	1	DG-AD5W	1/7/2019	**20**	**120**	**210**	<0.59	**0.43 J**	**0.96 J**	<3.7	**1.9 J**	**26**	**17**	<0.10	**13**	**1.2 J**	<4.6	<2.0	<3.5	<0.87	**11 J**
DG-AD9	1	DG-AD9W	1/11/2019	<4.1	**5.3 J**	**240**	<0.59	**0.42 J**	**10 U**	<3.7	**3.4**	**6.5 J**	**25**	<0.10	**6.1 J**	**16**	<4.6	**2.5 J**	<3.5	<0.87	**210**
DG-AE3	1	DG-AE3W	12/19/2018	<4.1	**120**	**220**	**0.75**	**0.27**	**4.7**	<3.7	**12**	<3.7	**9.6**	<0.10	**3.2**	**12**	<4.6	<2.0	<3.5	**2**	**8.2**
DG-AE7	1	DG-AE7W	1/11/2019	<4.1	**10**	**190**	<0.59	<0.21	**0.75 J**	<3.7	**2**	**4.5 J**	**6.6**	<0.10	**4.3 J**	**3.9 J**	<4.6	<2.0	**6.0 J**	<0.87	**18 J**
DG-AF5	1	DG-AF5W	1/7/2019	<4.1	**130**	**240**	<0.59	**1.4 J**	**0.99 J**	<3.7	**8.4**	**14 J**	**14**	**0.11 J**	**9.3 J**	**11**	<4.6	<2.0	<3.5	<0.87	**130**
DG-AG3	1	DG-AG3W	12/19/2018	<4.1	**86**	**150**	**0.74**	<0.21	**7.6**	<3.7	**13**	<3.7	<2.2	<0.10	**17**	**19**	<4.6	<2.0	**6.9**	**3.1**	**25**
DG-AG7	1	DG-AG7W	1/31/2019	<4.1	**9.9 J**	**230**	**0.64 J**	**0.41 J**	**1.4 J**	<3.7	**3.5**	**3.8 J**	**9.6**	<0.10	**7.2 J**	**3.1 J**	<4.6	<2.0	<3.5 R	<0.87	**27**
MW-11AR	1	MW-11ARW	12/18/2018	<2.7	**26**	**65**	<0.33	<1.3	<1.5	<3.7	**4.8**	<1.5	**7.8**	<0.10	<2.3	<0.80	<7.1	<1.2	<3.5	<0.70	<9.6
KMW-4A	1	KMW-4AW	12/18/2018	<2.7	**43**	**110**	<0.33	<1.3	<1.5	<3.7	**12**	<1.5	**9.2**	<0.10	<2.3	**12**	<7.1	<1.2	<3.5	<0.70	<9.6

Table 7: Dissolved Metals Concentrations in Fill Groundwater
Brisbane Baylands OU-2
Brisbane, California

Sample Location	Investigation Zone	Sample Name	Collection Date	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Chromium, Hexavalent	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
Aquatic Habitat Goal Saltwater Ecotox ESL [1]				5.0E+02	3.6E+01	--	--	9.3E+00	1.0E+03	5.0E+01	--	3.1E+00	8.1E+00	2.5E-02	--	8.2E+00	5.0E-01	1.9E-01	2.1E+02	--	8.1E+01
Site Specific Screening Level [2]				5.0E+04	3.6E+03	--	--	9.3E+02	1.0E+05	5.0E+03	--	3.1E+02	8.1E+02	2.5E+00	--	8.2E+02	5.0E+01	1.9E+01	2.1E+04	--	8.1E+03
Units				µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
DG-AH5	2	DG-AH5W	1/7/2019	**11**	**18**	**140**	**0.67 J**	<0.21	**1.5 J**	<3.7	**4.1**	**44**	**8.9**	<0.10	**24**	**4.0 J**	<4.6	<2.0	<3.5	**2.7 J**	<7.4
DG-AI3	2	DG-AI3W	12/19/2018	<4.1	**110**	**220**	<0.59	<0.21	**3.4**	<3.7	**13**	**4.2**	**10**	<0.10	**4**	**12**	<4.6	<2.0	<3.5	**2.5**	**8.6**
DG-AI3 (D)	2	DG-AI3 (D)W	12/19/2018	<4.1	**110**	**230**	<0.59	<0.21	**3.4**	<3.7	**14**	**4.6**	**11**	<0.10	**3.7**	**13**	<4.6	<2.0	<3.5	**2.6**	**12**
DG-AI7	2	DG-AI7W	1/11/2019	<4.1	**8.9 J**	**200**	**0.68 J**	**1.0 J**	**10 U**	<3.7	**2.5**	<3.7	**9.9**	<0.10	**4.1 J**	**2.6 J**	<4.6	<2.0	<3.5	<0.87	**15 J**
DG-AJ5	2	DG-AJ5W	1/7/2019	**21 J-**	**180 J**	**940 J**	**4.7**	**4.1**	**380 J**	<3.7	**77 J**	**450 J**	**320 J**	**0.14 J**	**14**	**420 J**	<4.6	**2.0 J**	<3.5	**280 J**	**540 J**
DG-AK3	2	DG-AK3W	12/19/2018	<4.1	**110**	**250**	<0.59	**0.23**	**3.1**	<3.7	**12**	**32**	**11**	**0.22**	**6.8**	**17**	<4.6	<2.0	<3.5	**2.8**	<7.4
DG-AK7	2	DG-AK7W	1/11/2019	<4.1	**7.9 J**	**200**	<0.59	**0.23 J**	**10 U**	<3.7	**3.2**	**3.7 J**	**11**	<0.10	**4.9 J**	**5.2 J**	<4.6	<2.0	<3.5	<0.87	**45**
DG-AK7 (D)	2	DG-AK7 (D)W	1/11/2019	<4.1	**8.0 J**	**200**	<0.59	<0.21 UJ	**10 U**	<3.7	**2.9**	<3.7 UJ	**11**	<0.10	**4.1 J**	**4.0 J**	<4.6	<2.0	<3.5	<0.87	**43**
DG-AL5	2	DG-AL5W	1/31/2019	<4.1	**160**	**170**	**0.61 J**	<0.21	**1.7 J**	<3.7	**6**	**11 J**	**11**	<0.10	**9.7 J**	**8.3 J**	<4.6	<2.0	<3.5 R	**1.5 J**	**14 J**
DG-AL9	2	DG-AL9W	1/22/2019	<4.1	**9.7 J**	**140**	<0.59	<0.21	**1.0 J**	<3.7	**1.7 J**	<3.7	<2.2	<0.10	<2.9	**2.0 J**	<4.6	<2.0	**13**	<0.87	**21**
DG-AM3	2	DG-AM3W	12/19/2018	<4.1	**110**	**390**	<0.59	<0.21	**3.1**	<3.7	**11**	**4.6**	<2.2	<0.10	**5.3**	**15**	<4.6	<2.0	**7.3**	**2.3**	**20**
DG-AM7	2	DG-AM7W	1/11/2019	<4.1	**15**	**280**	**0.61 J**	**0.47 J**	**10 U**	<3.7	**4.3**	**5.7 J**	**8.8**	<0.10	**4.9 J**	**4.7 J**	<4.6	**2.4 J**	<3.5	<0.87	**23**
DG-AN5	2	DG-AN5W	12/20/2018	<4.1	**200**	**160**	<0.59	<0.21	**2.2 J**	<3.7	**6.4**	<3.7	<2.2	<0.10	**4.6 J**	**6.6 J**	<4.6	<2.0	**5.6 J**	**10 U**	**21**
DG-AN9	2	DG-AN9W	1/21/2019	<4.1	**7.1 J**	**110**	<0.59	**0.21 J**	**1.2 J**	<3.7	**3.4**	**6.1 J**	**2.7 J**	<0.10	**4.0 J**	**3.4 J**	<4.6	<2.0	**8.9 J**	<0.87	**55**
DG-AO3	2	DG-AO3W	12/19/2018	<4.1	**110**	**150**	<0.59	<0.21	**4.1**	<3.7	**9.6**	<3.7	**12**	<0.10	**2.9**	**10**	<4.6	<2.0	<3.5	**2.3**	**24**
DG-AO7	2	DG-AO7W	1/11/2019	**5.3 J**	**13**	**290**	**0.64 J**	**1.4 J**	**10 U**	<3.7	**6.1**	**7.5 J**	**13**	<0.10	**8.4 J**	**7.6 J**	<4.6	**2.8 J**	<3.5	**1.1 J**	**57**
DG-AP5	2	DG-AP5W	12/20/2018	<4.1	**89**	**100**	<0.59	<0.21	**3.0 J**	<3.7	**7.4**	**5.5 J**	<2.2	<0.10	**4.4 J**	**8.0 J**	<4.6	<2.0	**7.6 J**	**10 U**	**11 J**
DG-AP9	2	DG-AP9W	1/21/2019	**4.7**	**3.9**	**140**	<0.59	**0.74 J**	**1.5 J**	<3.7	**4.2**	**17 J**	<2.2	<0.10	**4.4**	**4.8**	<4.6	<2.0	<3.5	<0.87	**78**
DG-AQ3	2	DG-AQ3W	12/19/2018	<4.1	**110**	**270**	<0.59	<0.21	**2.7**	<3.7	**12**	<3.7	**9.3**	<0.10	**3.5**	**11**	<4.6	<2.0	<3.5	**1.9**	**10**
DG-AQ7	2	DG-AQ7W	1/31/2019	<4.1	**34**	**82**	<0.59	**0.21 J**	**1.8 J**	<3.7	**6.5**	**12 J**	**16**	**0.19 J**	<2.9	**8.6 J**	<4.6	<2.0	<3.5 R	<0.87	**51**
DG-AR5	2	DG-AR5W	12/20/2018	<4.1	**70**	**190**	<0.59	<0.21	**2.9 J**	<3.7	**9**	**9.7 J**	<2.2	<0.10	**3.2 J**	**7.8 J**	**4.9 J**	<2.0	**8.1 J**	**10 U**	<7.4
DG-AR9	2	DG-AR9W	1/11/2019	<4.1	**12**	**120**	<0.59	<0.21	**10 U**	<3.7	**5.2**	**15 J**	**7.8**	<0.10	**7.4 J**	**5.5 J**	<4.6	**2.1 J**	<3.5	<0.87 UJ	**59**
DG-AR9 (D)	2	DG-AR9 (D)W	1/11/2019	<4.1	**11**	**140**	<0.59	<0.21	**10 U**	<3.7	**5.5**	**15 J**	**6.8**	<0.10	**7.4 J**	**5.7 J**	<4.6	**2.4 J**	<3.5	**0.88 J**	**59**
DG-AS3	2	DG-AS3W	12/20/2018	<4.1	**52**	**210**	<0.59	<0.21	**1.8 J**	<3.7	**5.8**	<3.7	<2.2	<0.10	**3.2 J**	**6.4 J**	<4.6 UJ	<2.0	**6.5 J**	**10 U**	<7.4
DG-AT5	2	DG-AT5W	12/20/2018	<4.1	**19**	**190**	<0.59	**0.30 J**	**1.1 J**	<3.7	**4.8**	**32**	<2.2	<0.10	**4.2 J**	**4.5 J**	<4.6	<2.0	<3.5	**10 U**	**60**
DG-AU3	2	DG-AU3W	12/20/2018	**9.0 J**	**100**	**120**	<0.59	<0.21	<0.70	<3.7	**2.4**	**7.7 J**	<2.2	<0.10	**15**	**2.8 J**	<4.6	<2.0	<3.5	**10 U**	**14 J**
DG-AU7	2	DG-AU7W	1/11/2019	<4.1	**61**	**98**	<0.59	<0.21	**1.1 J**	<3.7	**3.6**	**16 J**	**3.7 J**	<0.10	**3.5 J**	**3.6 J**	**20 U**	<2.0	**6.2 J**	<0.87	**52**
DG-AU7 (D)	2	DG-AU7 (D)W	1/11/2019	<4.1	**57**	**95**	<0.59	<0.21	**10 U**	<3.7	**4.2**	**12 J**	**11 J**	<0.10	**3.0 J**	**4.5 J**	<4.6	<2.0	<3.5 UJ	<0.87	**45**
DG-AV5	2	DG-AV5W	12/20/2018	**50**	**4,300**	**62**	<0.59	**0.25 J**	**6.1 J**	<3.7	**6.5**	**8.6 J**	**7.8**	<0.10	**6.2 J**	**11**	<4.6	<2.0	**43**	**10 U**	**15 J**
DG-AW3	2	DG-AW3W	1/31/2019	<4.1	**67**	**180**	<0.59	<0.21	**1.4 J**	<3.7	**7.9**	**6.0 J**	**9.9**	<0.10	**5.0 J**	**7.9 J**	<4.6	<2.0	<3.5 R	**1.9 J**	<7.4
DG-AY3	2	DG-AY3W	2/1/2019	<4.1	**38**	**85**	<0.59	<0.21	**5.3 J**	**5.8 J**	**4.3**	**13 J**	**11**	<0.10	**5.2 J**	**3.1 J**	<4.6	<2.0	<3.5 R	**2.1 J**	<7.4
LF-5A	2	LF-5AW	12/19/2018	<2.7	<2.6	**720**	<0.33	<1.3	<1.5	<3.7	<1.2	<1.5	<2.3	<0.10	<2.3	<0.80	<7.1	<1.2	<3.5	<0.70	<9.6
MW-10A	2	MW-10AW	12/19/2018	<2.7	**64**	**93 J**	<0.33	<1.3	<1.5	<3.7	**4.3**	<1.5	<2.3	<0.10	<2.3	<0.80	<7.1	<1.2	<3.5	<0.70	<9.6
KMW-7A	2	KMW-7AW	12/19/2018	<2.7	**41**	**170**	<0.33	<1.3	<1.5	<3.7	**8.7**	<1.5	<2.3	<0.10	<2.3	**11**	<7.1	<1.2	<3.5	<0.70	<9.6
DG-N9	3	DG-N9W	1/14/2019	<4.1	**42**	**67**	<0.59	<0.21	**1.0 J**	<3.7	**0.87 J**	**4.9 J**	<2.2	<0.10	<2.9	**1.6 J**	**7.2 J**	<2.0	<3.5	**1.1 J**	<7.4
DG-N13	3	DG-N13W	1/11/2019	**4.9 J**	**10 U**	**38 J**	<0.59	<0.21	**0.98 J**	<3.7	**0.93 J**	**5.7 J**	<2.2	<0.10	**5.8 J**	**1.7 J**	<4.6	<2.0	**3.6 J**	<0.87	<7.4
DG-N13 (D)	3	DG-N13 (D)W	1/11/2019	<4.1 UJ	**10 U**	**37 J**	<0.59	<0.21	**1.7 J**	<3.7	**1.2 J**	**6.3 J**	<2.2	<0.10	**5.3 J**	**1.5 J**	<4.6	<2.0	<3.5 UJ	<0.87	<7.4
DG-O7	3	DG-O7W	1/10/2019	<4.1	**10 U**	**75**	<0.59	<0.21	**1.9 J**	<3.7	**1.0 J**	**3.8 J**	<2.2	<0.10	**3.7 J**	**1.1 J**	<4.6	<2.0	**9.6 J**	**1.2 J**	<7.4
DG-O11	3	DG-O11W	1/14/2019	<4.1	**11**	**50 U**	<0.59	<0.21	**2.0 J**	<3.7	<0.68	<3.7	<2.2	<0.10	<2.9	**1.2 J**	<4.6	<2.0	<3.5	**6.2 J**	<7.4
DG-O15	3	DG-O15W	1/11/2019	<4.1	**68**	**110**	<0.59	<0.21	**0.85 J**	<3.7	**2.9**	**4.4 J**	<2.2	**0.14 J**	**6.9 J**	**10**	<4.6	<2.0	<3.5	**3.1 J**	<7.4
DG-P13	3	DG-P13W	1/11/2019	**6.6 J**	**10 U**	**42 J**	<0.59	<0.21	<0.70	<3.7	<0.68	**5.8 J**	<2.2	<0.10	**6.1 J**	<1.0	<4.6	<2.0	<3.5	**3.5 J**	<7.4
DG-Q11	3	DG-Q11W	1/15/2019	**4.6 J**	**12**	**48 J**	<0.59	<0.21	**1.4 J**	<3.7	**0.90 J**	<3.7	<2.2	<0.10	**4.8 J**	<1.0	<4.6	<2.0	**8.1 J**	<0.87 UJ	<7.4
DG-Q11 (D)	3	DG-Q11 (D)W	1/15/2019	<4.1 UJ	**12**	**44 J**	<0.59	<0.21	**1.6 J**	<3.7	**0.77 J**	<3.7	<2.2	<0.10	**4.9 J**	<1.0	<4.6	<2.0	**5.8 J**	**1.0 J**	<7.4

Table 7: Dissolved Metals Concentrations in Fill Groundwater
Brisbane Baylands OU-2
Brisbane, California

Sample Location	Investigation Zone	Sample Name	Collection Date	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Chromium, Hexavalent	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
Aquatic Habitat Goal Saltwater Ecotox ESL [1]				5.0E+02	3.6E+01	--	--	9.3E+00	1.0E+03	5.0E+01	--	3.1E+00	8.1E+00	2.5E-02	--	8.2E+00	5.0E-01	1.9E-01	2.1E+02	--	8.1E+01
Site Specific Screening Level [2]				5.0E+04	3.6E+03	--	--	9.3E+02	1.0E+05	5.0E+03	--	3.1E+02	8.1E+02	2.5E+00	--	8.2E+02	5.0E+01	1.9E+01	2.1E+04	--	8.1E+03
Units				µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
DG-Q15	3	DG-Q15W	1/11/2019	<4.1	**12**	**88**	<0.59	<0.21	**1.6 J**	<3.7	**17**	**7.1 J**	<2.2	<0.10	**5.7 J**	**23**	<4.6	<2.0	<3.5	**3.3 J**	<7.4
DG-R9	3	DG-R9W	1/25/2019	<4.1	**65**	**62**	<0.59	**0.25 J**	**1.7 J**	<3.7	<0.68	<3.7	<2.2	**0.12 J**	**43**	**2.9 J**	<4.6	<2.0	<3.5	<0.87	<7.4
DG-R13	3	DG-R13W	1/29/2019	**5.5 J**	**6.9 J**	**24 J**	<0.59	<0.21	**1.0 J**	<3.7	<0.68	<3.7	<2.2	<0.10	**4.4 J**	<1.0	<4.6	<2.0	<3.5 R	**0.91 J**	<7.4
DG-S11	3	DG-S11W	1/15/2019	**6.5 J**	**5.5 J**	**50**	**0.83 J**	**0.72 J**	<0.70	<3.7	**3**	<3.7	**9**	<0.10	**12**	**2.7 J**	<4.6	<2.0	<3.5	**2.2 J**	<7.4
DG-S15	3	DG-S15W	1/11/2019	<4.1	**10 U**	**38 J**	<0.59	<0.21	<0.70	<3.7	**0.73 J**	**4.9 J**	<2.2	<0.10	**5.3 J**	<1.0	<4.6	<2.0	<3.5	**1.3 J**	<7.4
DG-S15 (D)	3	DG-S15 (D)W	1/11/2019	<4.1	**10 U**	**38 J**	<0.59	<0.21	<0.70	<3.7	**1.0 J**	**4.2 J**	<2.2	<0.10	**5.5 J**	<1.0	<4.6	<2.0	<3.5	**1.9 J**	<7.4
DG-T9	3	DG-T9W	1/14/2019	<4.1	**16**	**690**	<0.59	<0.21	<0.70	<3.7	<0.68	<3.7	<2.2	<0.10	**5.7 J**	<1.0	**5.6 J**	<2.0	<3.5	<0.87	**20 U**
DG-T13	3	DG-T13W	1/15/2019	<4.1	**8.4 J**	**92**	<0.59	<0.21	**1.0 J**	<3.7	<0.68	<3.7	<2.2	<0.10	**17**	<1.0	<4.6	<2.0	**4.4 J**	<0.87	<7.4
DG-U11	3	DG-U11W	1/15/2019	<4.1	**31**	**87**	<0.59	<0.21	**0.86 J**	<3.7	**0.68 J**	<3.7	<2.2	<0.10	**3.4 J**	<1.0	<4.6	<2.0	**6.4 J**	**1.3 J**	<7.4
DG-U15	3	DG-U15W	1/28/2019	<4.1	**3.8 J**	**49 J**	<0.59	<0.21	<0.70	<3.7	<0.68	<3.7	<2.2	**0.23**	**3.8 J**	**1.7 J**	<4.6	<2.0	<3.5 R	<0.87	<7.4
DG-V13	3	DG-V13W	1/15/2019	<4.1	**4.4 J**	**47 J**	<0.59	<0.21	**0.88 J**	<3.7	<0.68	**8.2 J**	<2.2	<0.10	<2.9	**1.7 J**	<4.6	<2.0	<3.5	**1.5 J**	**7.8 J**
DG-V17	3	DG-V17W	1/28/2019	**5.5 J**	<2.9	**61**	<0.59	<0.21	<0.70	<3.7	<0.68	<3.7	<2.2	<0.10	**5.8 J**	<1.0	**6.9 J**	<2.0	<3.5 R	<0.87	<7.4
MW-9A	3	MW-9AW	12/18/2018	<2.7	<2.6	**93**	<0.33	<1.3	<1.5	<3.7	<1.2	<1.5	**13**	<0.10	<2.3	<0.80	<7.1	<1.2	<3.5	<0.70	<9.6
LF-3A	3	LF-3AW	12/18/2018	<2.7	<2.6	**47**	<0.33	<1.3	<1.5	<3.7	<1.2	<1.5	**12**	<0.10	<2.3	<0.80	<7.1	<1.2	<3.5	<0.70	<9.6
LF-3A (D)	3	LF-3A (D)W	12/18/2018	<2.7	<2.6	**48**	<0.33	<1.3	<1.5	<3.7	<1.2	<1.5	**14**	<0.10	<2.3	<0.80	<7.1	<1.2	<3.5	<0.70	<9.6
DG-W15	4	DG-W15W	1/29/2019	<4.1	**4.2 J**	**48 J**	<0.59	<0.21	<0.70	<3.7	<0.68	<3.7	<2.2	<0.10	**7.7 J**	<1.0	<4.6	<2.0	<3.5 R	<0.87	<7.4
DG-X13	4	DG-X13W	1/25/2019	<4.1	<2.9	**110**	<0.59	<0.21	**1.1 J**	<3.7	<0.68	<3.7	<2.2	<0.10	**3.6 J**	<1.0	<4.6	<2.0	<3.5	<0.87	<7.4
DG-X17	4	DG-X17W	1/28/2019	**6.0 J**	**3.8 J**	**52**	<0.59	<0.21	<0.70	<3.7	<0.68	**4.7 J**	<2.2	<0.10	**3.5 J**	<1.0	<4.6	<2.0	<3.5 R	**1.5 J**	<7.4
DG-Y11	4	DG-Y11W	1/22/2019	<4.1	**4.1 J**	**910**	<0.59	<0.21	**2.3 J**	<3.7	**4.5**	**6.8 J**	<2.2	<0.10	<2.9	**100**	<4.6	<2.0	<3.5	**2.2 J**	**57**
DG-Y15	4	DG-Y15W	2/1/2019	<4.1	<2.9	**50 U**	<0.59	<0.21	<0.70	<3.7	<0.68	<3.7	**7.4**	<0.10	<2.9	<1.0	<4.6	<2.0	<3.5 R	<0.87	<7.4
DG-Y19	4	DG-Y19W	1/28/2019	<4.1	**20**	**390**	<0.59	<0.21	**3.9 J**	<3.7	<0.68	**20**	**59**	<0.10	<2.9	**2.0 J**	<4.6	<2.0	<3.5 R	**3.7 J**	**27**
DG-Z17	4	DG-Z17W	1/28/2019	<4.1	<2.9	**96 J**	**0.82**	**0.45**	**1.0 J**	<3.7	**0.68**	<3.7	**8.8**	<0.10	**2.9 J**	**1.3 J**	<4.6	<2.0	<3.5 R	**1.5**	<7.4
DG-AA11	4	DG-AA11W	1/30/2019	**4.3 J**	**3.5 J**	**110**	**0.65 J**	<0.21	**1.4 J**	<3.7	<0.68	<3.7	<2.2	<0.10	<2.9	<1.0	<4.6	<2.0	<3.5 R	**0.99 J**	<7.4
DG-AA15	4	DG-AA15W	1/25/2019	<4.1	<2.9	**66**	<0.59	<0.21	**1.6 J**	<3.7	<0.68	<3.7	<2.2	<0.10	<2.9	<1.0	<4.6	<2.0	<3.5	<0.87	<7.4
DG-AA19	4	DG-AA19W	1/25/2019	<4.1	**17**	**1,700**	<0.59	<0.21	**1.3 J**	<3.7	<0.68	<3.7	<2.2	<0.10	<2.9	<1.0	<4.6	<2.0	<3.5	<0.87	<7.4
DG-AB13	4	DG-AB13W	1/25/2019	<4.1	**4.2 J**	**280**	<0.59	<0.21	**0.91 J**	<3.7	**0.83 J**	<3.7	<2.2	<0.10	<2.9	**3.1 J**	<4.6	<2.0	<3.5	**0.89 J**	**9.8 J**
DG-AB13 (D)	4	DG-AB13 (D)W	1/25/2019	<4.1	**5.3 J**	**290**	<0.59	<0.21	<0.70 UJ	<3.7	<0.68 UJ	<3.7	<2.2	<0.10	<2.9	<1.0 UJ	<4.6	<2.0	<3.5	<0.87 UJ	**8.6 J**
DG-AD13	4	DG-AD13W	2/1/2019	<4.1	**13**	**770**	<0.59	<0.21	**1.7 J**	**48**	**2.5**	<3.7 UJ	**8.8 J**	<0.10	**5.3 J**	**24**	<4.6	<2.0	<14	**20**	<7.4 UJ
DG-AD13 (D)	4	DG-AD13 (D)W	2/1/2019	<4.1	**12**	**890**	<0.59	<0.21	**1.9 J**	**47**	**2.8**	**6.0 J**	**15 J**	<0.10	**5.9 J**	**29**	<4.6	<2.0	**7.8 R**	**20**	**11 J**
DG-AE11	4	DG-AE11W	1/22/2019	<4.1	**27**	**1,200**	<0.59	<0.21	**0.77 J**	<3.7	<0.68	<3.7	<2.2	<0.10	**5.3 J**	**7.6 J**	<4.6	<2.0	**6.0 J**	<0.87	<7.4
DG-AG11	4	DG-AG11W	1/22/2019	<4.1	**28**	**1,900**	<0.59	<0.21	**1.1 J**	<3.7	<0.68	<3.7	<2.2	<0.10	<2.9	**1.8 J**	<4.6	<2.0	<3.5	<0.87	<7.4
DG-AH13	4	DG-AH13W	1/29/2019	<4.1	**4.7 J**	**110**	<0.59	<0.21	**2.0 J**	<3.7	**3.7**	**4.7 J**	<2.2	<0.10	<2.9	<1.0	<4.6	<2.0	<3.5 R	**4.2 J**	<7.4
DG-AJ13	4	DG-AJ13W	1/29/2019	<4.1	**9.8 J**	**1,300**	<0.59	<0.21	**1.2 J**	<3.7	**0.87 J**	<3.7	<2.2	<0.10	**3.5 J**	**1.2 J**	<4.6	<2.0	<3.5 R	**1.1 J**	**41**
DG-AK11	4	DG-AK11W	1/29/2019	<4.1	**12**	**1,700**	<0.59	<0.21	**1.4 J**	<3.7	<0.68	<3.7	<2.2	<0.10	**8.6 J**	<1.0	<4.6	<2.0	<3.5 R	<0.87	<7.4
DG-AL13	4	DG-AL13W	1/29/2019	**5.7 J**	**18**	**870**	<0.59	<0.21	**1.4 J**	<3.7	**1.3 J**	**6.6 J**	<2.2	<0.10	**4.0 J**	**1.8 J**	<4.6	<2.0	<3.5 R	<0.87	**56**
DG-AN13	4	DG-AN13W	2/1/2019	<4.1	**4.1 J**	**82**	<0.59	<0.21	<0.70	<3.7	**1.3 J**	**9.4 J**	**29**	<0.10	<2.9	<1.0	<4.6	<2.0	<3.5 R	<0.87	<7.4
MW-15A	4	MW-15AW	12/18/2018	<2.7	<2.6	**550**	<0.33	<1.3	<1.5	<3.7	<1.2	<1.5	**16**	<0.10	<2.3	**42**	<7.1	<1.2	<3.5	<0.70	<9.6
MW-17A	4	MW-17AW	12/18/2018	<2.7	<2.6	**97**	<0.33	<1.3	<1.5	<3.7	<1.2	<1.5	**8.5**	<0.10	<2.3	<0.80	<7.1	<1.2	<3.5	<0.70	<9.6
MW-17A (D)	4	MW-17A (D)W	12/18/2018	<2.7	<2.6	**100**	<0.33	<1.3	<1.5	<3.7	<1.2	<1.5	**11**	<0.10	<2.3	<0.80	<7.1	<1.2	<3.5	<0.70	<9.6
LF-4A	4	LF-4AW	12/18/2018	<2.7	**390**	**2,400**	<0.33	<1.3	<1.5	**12**	<1.2	**74**	**30**	<0.10	<2.3	**48**	<7.1	<1.2	<3.5	<0.70	<9.6
LF-8A	4	LF-8AW	12/19/2018	<2.7	**13**	**1,800**	<0.33	<1.3	<1.5	**14**	<1.2	<1.5	**9.4**	<0.10	<2.3	<0.80	<7.1	<1.2	<3.5	<0.70	<9.6
DG-AQ11	5	DG-AQ11W	1/31/2019	<4.1	**4.1 J**	**570**	**0.59 J**	<0.21	<0.70	<3.7	**1.8 J**	<3.7	**9.1**	<0.10	<2.9	<1.0	<4.6	<2.0	<3.5 R	<0.87	**12 J**
DG-AT9	5	DG-AT9W	1/31/2019	<4.1	<2.9	**500**	<0.59	**0.22 J**	<0.70	<3.7	**3.5**	**8.5 J**	**17**	<0.10	<2.9	**6.8 J**	<4.6	<2.0	<3.5 R	<0.87	**380**

Table 7: Dissolved Metals Concentrations in Fill Groundwater
Brisbane Baylands OU-2
Brisbane, California

Sample Location	Investigation Zone	Sample Name	Collection Date	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Chromium, Hexavalent	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
Aquatic Habitat Goal Saltwater Ecotox ESL [1]				5.0E+02	3.6E+01	--	--	9.3E+00	1.0E+03	5.0E+01	--	3.1E+00	8.1E+00	2.5E-02	--	8.2E+00	5.0E-01	1.9E-01	2.1E+02	--	8.1E+01
Site Specific Screening Level [2]				5.0E+04	3.6E+03	--	--	9.3E+02	1.0E+05	5.0E+03	--	3.1E+02	8.1E+02	2.5E+00	--	8.2E+02	5.0E+01	1.9E+01	2.1E+04	--	8.1E+03
Units				µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
DG-AV9	5	DG-AV9W	2/1/2019	<4.1	**4.0 J**	**110**	<0.59	**1.2 J**	**0.88 J**	<3.7	**2.9**	**15 J**	**28**	<0.10	<2.9	**12**	<4.6	<2.0	<3.5 R	<0.87	**430**
DG-AX5	5	DG-AX5W	12/20/2018	<4.1	**14**	**110**	<0.59	<0.21	**1.5 J**	<3.7	**2.1**	<3.7	<2.2	<0.10	**8.9 J**	**2.2 J**	**5.7 J**	<2.0	**6.8 J**	**10 U**	<7.4
MK-7A	5	MK-7AW	12/19/2018	<2.7	<2.6	**320**	<0.33	<1.3	<1.5	<3.7	**2.1**	**25**	<2.3	<0.10	<2.3	<0.80	<7.1	<1.2	<3.5	<0.70	**88**
LF-7A	5	LF-7AW	12/19/2018	<2.7	<2.6	**580**	<0.33	<1.3	<1.5	<3.7	<1.2	<1.5	<2.3	<0.10	<2.3	<0.80	<7.1	<1.2	<3.5	<0.70	**55**
MK-8A	5	MK-8AW	12/19/2018	<2.7	<2.6	**52**	<0.33	<1.3	<1.5	<3.7	<1.2	**23**	<2.3	<0.10	<2.3	**19**	<7.1	<1.2	<3.5	<0.70	**670**
DG-AB17	6	DG-AB17W	1/25/2019	<4.1	<2.9	**110**	<0.59	<0.21	<0.70	<3.7	<0.68	<3.7	<2.2	<0.10	<2.9	<1.0	<4.6	<2.0	<3.5	<0.87	<7.4
DG-AC15	6	DG-AC15W	2/1/2019	<4.1	**64**	**1,900**	<0.59	<0.21	<0.70	<3.7	**1.4 J**	**3.7 J**	**9.3**	<0.10	<2.9	**1.3 J**	<4.6	<2.0	<3.5 R	<0.87	<7.4
DG-AD17	6	DG-AD17W	1/25/2019	<4.1	**13**	**310**	<0.59	<0.21	<0.70	<3.7	**3.3**	<3.7	<2.2	<0.10	**12**	**7.2 J**	<4.6	<2.0	<3.5	<0.87	<7.4
DG-AG15	6	DG-AG15W	1/24/2019	<4.1	**7.5 J**	**220**	<0.59	<0.21	**2.3 J**	<3.7	**4.2**	<3.7	<2.2	**0.15 J**	<2.9	**4.9 J**	<4.6	<2.0	<3.5 R	**3.1 J**	<7.4
DG-AI15	6	DG-AI15W	1/25/2019	<4.1	**16**	**250**	<0.59	<0.21	<0.70	<3.7	<0.68	<3.7	<2.2	<0.10	<2.9	**6.9 J**	<4.6	<2.0	<3.5	<0.87	**7.4 J**
DG-AK15	6	DG-AK15W	1/24/2019	<4.1	**9.2 J**	**290**	<0.59	<0.21	**3.0 J**	<3.7	**5.8**	**5.5 J**	<2.2	<0.10	**7.0 J**	**2.0 J**	<4.6	<2.0	<3.5 R	**2.4 J**	<7.4
DG-AM15	6	DG-AM15W	1/24/2019	<4.1	**2.9 J**	**50 U**	<0.59	<0.21	**1.5 J**	<3.7	<0.68	**3.9 J**	<2.2	<0.10	**4.4 J**	**1.1 J**	<4.6	<2.0	<3.5 R	**2.3 J**	<7.4
DG-AS11	6	DG-AS11W	1/31/2019	<4.1	<2.9	**250**	**0.60 J**	**0.41 J**	<0.70	<3.7	**1.2 J**	**21**	**16**	<0.10	<2.9	**4.6 J**	<4.6	<2.0	<3.5 R	<0.87	**220**
DG-AW11	6	DG-AW11W	1/24/2019	<4.1	<2.9 UJ	**50 UJ**	<0.59	<0.21	**1.2 J**	<3.7	<0.68	**4.6 J**	<2.2	<0.10	**5.1 J**	**1.1 J**	<4.6	<2.0	<3.5 R	**2.6 J**	<7.4
DG-AW11 (D)	6	DG-AW11 (D)W	1/24/2019	<4.1	**4.5 J**	**70 J**	<0.59	<0.21	**1.8 J**	<3.7	<0.68	<3.7 UJ	<2.2	<0.10	<2.9 UJ	<1.0 UJ	<4.6	<2.0	<3.5 R	<0.87 UJ	<7.4
MW-13A	6	MW-13AW	12/18/2018	<2.7	<2.6	**96**	<0.33	<1.3	<1.5	<3.7	**3.3**	<1.5	**8.8**	<0.10	<2.3	<0.80	<7.1	<1.2	<3.5	<0.70	<9.6

Notes:

1. San Francisco Bay RWQCB, 2019. Summary of Groundwater ESLs, Jan. 2019 (Rev. 1) - Aquatic Habitat Goal Levels (Table GW-2): Saltwater Ecotoxicity.
2. Site specific screening level is the saltwater ecotoxicity ESL with a 100-fold attenuation factor.
- Metals were analyzed by USEPA Methods 6010B, 7196, and 7471A.
- Non-detect results are presented with "<" followed by the MDL.
- Results in bold font indicate a detection above the MDL.
- Gray shading indicates a detection above the comparison criteria.

Abbreviations and Symbols:

"J" - Analyte was detected but the associated numerical value is the approximate concentration.
"J+" - Analyte was detected but the associated numerical value is likely to be higher than the concentration of the analyte in the sample due to positive bias of associated QC or calibration data or attributable to matrix interference.
"J-" - Analyte was detected but the associated numerical value is likely to be lower than the concentration of the analyte in the sample due to negative bias of associated QC or calibration data or attributable to matrix interference.
"U" - Not detected at or above the reported result.
"UJ" - The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
"R" - The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.
"--" - Not Available
"<" - Non-detect result
(D) - Duplicate sample
µg/L - microgram per liter
ESL - Environmental Screening Level
MDL - Method Detection Limit
QC - quality control
RWQCB - Regional Water Quality Control Board
USEPA - United States Environmental Protection Agency

Table 8: Polynuclear Aromatic Hydrocarbons and TPH as Diesel and Motor Oil Concentrations in Fill
Brisbane Baylands OU-2
Brisbane, California

Sample Location	Sample Name	Investigation Zone	Collection Date	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenzo(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Naphthalene	Phenanthrene	Pyrene	TPH-Diesel (C10-C28)	TPH-Motor Oil (C24-C36)
Aquatic Habitat Goal Levels Saltwater Ecotox ESL [1]				1.5E+01	1.5E+01	1.5E+01	1.5E+01	1.5E+01	1.5E+01	1.5E+01	1.5E+01	1.5E+01	8.0E+00	1.5E+01	1.5E+01	1.5E+01	4.6E+00	1.5E+01	6.4E+02	--
Site Specific Screening Level [2]				1.5E+03	1.5E+03	1.5E+03	1.5E+03	1.5E+03	1.5E+03	1.5E+03	1.5E+03	1.5E+03	8.0E+02	1.5E+03	1.5E+03	1.5E+03	4.6E+02	1.5E+03	6.4E+04	--
Units				µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
DG-N1	DG-N1W	1	12/18/2018	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	**0.2**	<0.10	**130**	<96
DG-N5	DG-N5W	1	1/10/2019	<0.11	<0.11	**0.26**	**0.24**	**0.35**	**0.20 J**	**0.16 J**	**0.24**	<0.11	**0.46**	<0.11	**0.19 J**	**0.11 J**	**0.21**	**0.46**	**140 J**	<0.25
DG-O3	DG-O3W	1	12/18/2018	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<110	<110
DG-P5	DG-P5W	1	1/10/2019	<0.098	<0.098	<0.098	<0.098	<0.098	<0.098	<0.098	<0.098	<0.098	<0.098	<0.098	<0.098	<0.098	<0.098	<0.098	<99	<99
DG-Q7	DG-Q7W	1	1/10/2019	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	**150 J**	**160 J**
DG-Q7 (D)	DG-Q7 (D)W	1	1/10/2019	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	**130 J**	**110 J**
DG-R1	DG-R1W	1	12/17/2018	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	**0.14 J**	**200 J**	**130 J**
DG-R5	DG-R5W	1	1/30/2019	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	**0.32**	<0.10	**0.14 J**	**0.41**	**0.12 J**	**220 J**	**120 J**
DG-S3	DG-S3W	1	12/18/2018	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	**0.11**	<0.099	**1,200**	**1,700**
DG-S7	DG-S7W	1	1/10/2019	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<98	<98
DG-T1	DG-T1W	1	12/17/2018	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	**0.15 J**	**0.23**	**270 J**	**160 J**
DG-T5	DG-T5W	1	1/7/2019	<0.99	<0.99	<0.99	<0.99	<0.99	<0.99	<0.99	<0.99	<0.99	<0.99	<0.99	<0.99	<0.99	<0.99	<0.99	**330 J**	<100
DG-U3	DG-U3W	1	12/18/2018	<0.20	**0.36**	<0.20	**0.26**	**0.46**	**0.24**	<0.20	**0.46**	<0.20	**0.73**	<0.20	<0.20	**1.5**	**1.5**	**0.77**	**1,000**	**2,600**
DG-U3 (D)	DG-U3 (D)W	1	12/18/2018	<0.20	**0.34**	<0.20	**0.23**	**0.46**	**0.21**	<0.20	**0.43**	<0.20	**0.64**	<0.20	<0.20	**0.87**	**1.1**	**0.67**	**310**	**750**
DG-U7	DG-U7W	1	1/10/2019	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<100	<100
DG-V1	DG-V1W	1	12/17/2018	<0.099	<0.099	<0.099	<0.099 UJ	**0.13 J**	**0.13 J**	<0.099 UJ	<0.099	<0.099 UJ	**0.11 J**	<0.099	<0.099 UJ	<0.099	**0.11 J**	**0.51**	**3,200**	**3,300**
DG-V5	DG-V5W	1	1/7/2019	<0.099 UJ	<0.099 UJ	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099 UJ	<0.099 UJ	<0.099	<0.099	<0.099 UJ	<0.099 UJ	<100	<100
DG-V9	DG-V9W	1	1/14/2019	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<110	<110
DG-W3	DG-W3W	1	12/18/2018	<0.10	**0.16**	**0.18**	**0.26**	**0.29**	**0.24**	<0.10	**0.22**	<0.10	**1.3**	<0.10	**0.17**	<0.10	**0.48**	**1.4**	**170**	**130**
DG-W7	DG-W7W	1	1/30/2019	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<100	<100
DG-X1	DG-X1W	1	12/17/2018	<0.099	<0.099	**0.12 J**	**0.51**	**0.47**	**0.88**	**0.14 J**	**0.19 J**	<0.099	**0.32**	<0.099	**0.64**	<0.099	**0.23**	**0.69**	**290 J**	**160 J**
DG-X5	DG-X5W	1	1/7/2019	**0.29 J**	**0.37 J**	**0.89**	**1.3**	**1.3**	**1.2**	**0.53**	**0.95**	<0.20	**1.6**	<0.20	**0.89**	**0.25 J**	**1.1**	**2.1**	<100	--
DG-X9	DG-X9W	1	1/14/2019	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<100	<100
DG-Y3	DG-Y3W	1	12/18/2018	<0.10	**0.15**	**0.29**	**0.72**	**0.76**	**0.78**	**0.24**	**0.41**	<0.10	**1.2**	<0.10	**0.63**	**0.16**	**0.53**	**1.5**	**240**	**180**
DG-Y7	DG-Y7W	1	1/11/2019	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<100	<100
DG-Z5	DG-Z5W	1	1/7/2019	**0.12 J**	**0.15 J**	**0.26**	**0.83**	**0.83**	**1.1**	**0.29**	**0.38**	<0.099	**0.75**	<0.099	**0.79**	**0.38**	**0.28**	**0.96**	<110	<110
DG-Z9	DG-Z9W	1	1/15/2019	<0.11	<0.11	<0.11	**0.16 J**	**0.24**	**0.42**	<0.11	**0.17 J**	<0.11	**0.37**	<0.11	**0.25**	<0.11	**0.13 J**	**0.41**	**140 J**	**240 J**
DG-AA3	DG-AA3W	1	12/18/2018	<0.10	<0.10	<0.10	**0.11**	**0.16**	**0.1**	<0.10	**0.11**	<0.10	**0.19**	<0.10	<0.10	<0.10	**0.19**	**0.27**	**280**	**210**
DG-AA7	DG-AA7W	1	1/11/2019	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	**120 J**	**130 J**
DG-AB5	DG-AB5W	1	1/31/2019	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	**160 J**	**110 J**
DG-AB5 (D)	DG-AB5 (D)W	1	1/31/2019	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	**150 J**	**110 J**
DG-AC3	DG-AC3W	1	12/19/2018	<0.10	<0.10	**0.16**	**0.36**	**0.38**	**0.5**	**0.11**	**0.23**	<0.10	**0.46**	<0.10	**0.4**	<0.10	**0.16**	**0.7**	**340**	**240**
DG-AC7	DG-AC7W	1	1/11/2019	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	**110 J**	**140 J**
DG-AC7 (D)	DG-AC7 (D)W	1	1/11/2019	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<100 UJ	<100 UJ
DG-AD5	DG-AD5W	1	1/7/2019	<0.099	**0.14 J**	**0.5**	**1.3**	**1.3**	**1.4**	**0.32**	**0.7**	<0.099	**2.9**	<0.099	**1**	**0.13 J**	**0.15 J**	**2.7**	**120 J**	**120 J**

Table 8: Polynuclear Aromatic Hydrocarbons and TPH as Diesel and Motor Oil Concentrations in Fill
Brisbane Baylands OU-2
Brisbane, California

Sample Location	Sample Name	Investigation Zone	Collection Date	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenzo(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Naphthalene	Phenanthrene	Pyrene	TPH-Diesel (C10-C28)	TPH-Motor Oil (C24-C36)
Aquatic Habitat Goal Levels Saltwater Ecotox ESL [1]				1.5E+01	1.5E+01	1.5E+01	1.5E+01	1.5E+01	1.5E+01	1.5E+01	1.5E+01	1.5E+01	8.0E+00	1.5E+01	1.5E+01	1.5E+01	4.6E+00	1.5E+01	6.4E+02	--
Site Specific Screening Level [2]				1.5E+03	1.5E+03	1.5E+03	1.5E+03	1.5E+03	1.5E+03	1.5E+03	1.5E+03	1.5E+03	8.0E+02	1.5E+03	1.5E+03	1.5E+03	4.6E+02	1.5E+03	6.4E+04	--
Units				µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
DG-AD9	DG-AD9W	1	1/11/2019	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	**650**	**570**
DG-AE3	DG-AE3W	1	12/19/2018	<0.10	<0.10	**0.12**	**0.19**	**0.22**	**0.24**	<0.10	**0.15**	<0.10	**0.31**	<0.10	**0.19**	<0.10	**0.18**	**0.39**	**310**	**180**
DG-AE7	DG-AE7W	1	1/11/2019	<0.11	<0.11	**0.22**	**0.25**	**0.3**	**0.26**	**0.14 J**	**0.18 J**	<0.11	**0.47**	<0.11	**0.22**	<0.11	**0.14 J**	**0.42**	**230 J**	**190 J**
DG-AF5	DG-AF5W	1	1/7/2019	<0.10	**0.13 J**	**0.29**	**0.45**	**0.49**	**0.47**	**0.19 J**	**0.36**	<0.10	**0.69**	<0.10	**0.38**	**0.11 J**	**0.36**	**0.89**	**130 J**	<110
DG-AG3	DG-AG3W	1	12/19/2018	<0.51	<0.51	<0.51	<0.51	<0.51	<0.51	<0.51	<0.51	<0.51	<0.51	<0.51	<0.51	<0.51	<0.51	<0.51	**2,200**	**2,900**
DG-AG7	DG-AG7W	1	1/31/2019	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	**180 J**	**130 J**
MW-11AR	MW-11ARW	1	12/18/2018	<0.41	<0.28	<0.62	<0.95	<0.32	<0.36	<0.30	<0.95	<0.38	<0.95	<0.47	<0.37	<0.95	<0.32	<0.30	**190**	**210**
KMW-4A	KMW-4AW	1	12/18/2018	<0.41	<0.28	<0.62	<0.95	<0.32	<0.36	<0.29	<0.95	<0.38	<0.95	<0.46	<0.37	<0.95	<0.32	<0.30	**450**	**240**
DG-AH5	DG-AH5W	2	1/7/2019	<0.099	<0.099	<0.099	<0.099	**0.12 J**	**0.11 J**	<0.099	<0.099	<0.099	**0.17 J**	<0.099	<0.099	<0.099	**0.14 J**	**0.23**	<100	<100
DG-AI3	DG-AI3W	2	12/19/2018	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	**780**	**620**
DG-AI3 (D)	DG-AI3 (D)W	2	12/19/2018	**0.13**	**0.17**	**0.12**	**0.2**	**0.29**	**0.28**	**0.098**	**0.19**	<0.096	**0.46**	<0.096	**0.2**	**0.32**	**0.36**	**0.69**	**640**	**500**
DG-AI7	DG-AI7W	2	1/11/2019	<0.11	<0.11	<0.11	<0.11	<0.11	**0.13 J**	<0.11	<0.11	<0.11	**0.15 J**	<0.11	<0.11	<0.11	<0.11	**0.16 J**	**310 J**	--
DG-AJ5	DG-AJ5W	2	1/7/2019	**0.30 J**	**0.29 J**	**0.8**	**1.7**	**2**	**2.5**	**0.57**	**1.2**	<0.20	**3.7**	<0.20	**1.9**	**0.83**	**1.2**	**3.6**	**240 J**	<110
DG-AK3	DG-AK3W	2	12/19/2018	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	**0.11**	<0.099	<0.099	<0.099	**0.15**	**0.13**	**500**	**380**
DG-AK7	DG-AK7W	2	1/11/2019	<0.11	<0.11	<0.11	**0.12 J**	**0.16 J**	**0.24 J**	<0.11	**0.11 J**	<0.11	**0.21 J**	<0.11	**0.16 J**	<0.11	<0.11	**0.23 J**	**170 J**	**120 J**
DG-AK7 (D)	DG-AK7 (D)W	2	1/11/2019	<0.11	<0.11	<0.11	<0.11 UJ	<0.11 UJ	<0.11 UJ	<0.11	<0.11 UJ	<0.11	<0.11 UJ	<0.11	<0.11 UJ	<0.11	<0.11	<0.11 UJ	**160 J**	**100 J**
DG-AL5	DG-AL5W	2	1/31/2019	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	**460 J**	**350 J**
DG-AL9	DG-AL9W	2	1/22/2019	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	**130 J**	--
DG-AM3	DG-AM3W	2	12/19/2018	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	**400**	**190**
DG-AM7	DG-AM7W	2	1/11/2019	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	**0.14 J**	<0.11	<0.11	<0.11	<0.11	**0.15 J**	**180 J**	--
DG-AN5	DG-AN5W	2	12/20/2018	<0.099	<0.099	**0.33**	**0.46**	**0.65**	**0.44**	**0.21**	**0.41**	<0.099	**0.7**	<0.099	**0.38**	**0.11 J**	**0.47**	**0.69**	**290 J**	**120 J**
DG-AN9	DG-AN9W	2	1/21/2019	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	**150 J**	<110
DG-AO3	DG-AO3W	2	12/19/2018	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	**5,300**	**4,200**
DG-AO7	DG-AO7W	2	1/11/2019	<0.10	<0.10	<0.10	<0.10	**0.10 J**	<0.10	<0.10	<0.10	<0.10	**0.11 J**	<0.10	<0.10	<0.10	<0.10	**0.13 J**	**200 J**	**150 J**
DG-AP5	DG-AP5W	2	12/20/2018	<0.099	<0.099	<0.099	**0.11 J**	**0.16 J**	<0.099	<0.099	**0.12 J**	<0.099	**0.22**	<0.099	<0.099	<0.099	**0.15 J**	**0.22**	**330 J**	**250 J**
DG-AP9	DG-AP9W	2	1/21/2019	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	**130 J**	<110
DG-AQ3	DG-AQ3W	2	12/19/2018	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	**480**	**350**
DG-AQ7	DG-AQ7W	2	1/31/2019	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	**280 J**	--
DG-AR5	DG-AR5W	2	12/20/2018	<0.098	<0.098	**0.10 J**	**0.11 J**	**0.13 J**	<0.098	<0.098	**0.10 J**	<0.098	**0.17 J**	<0.098	<0.098	<0.098	**0.12 J**	**0.19 J**	**990**	**220 J**
DG-AR9	DG-AR9W	2	1/11/2019	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	**0.20 J**	<0.11	<0.11	<0.11	<0.11	**0.23 J**	**180 J**	**160 J**
DG-AR9 (D)	DG-AR9 (D)W	2	1/11/2019	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11 UJ	<0.11	<0.11	<0.11	<0.11	<0.11 UJ	**150 J**	--
DG-AS3	DG-AS3W	2	12/20/2018	**0.4**	**0.18 J**	**1.1**	**2.1**	**2.2**	**1.2**	**0.71**	**1.8**	**0.3**	**1.2**	<0.10	**0.99**	**0.55**	**0.63**	**2.8**	**3,200**	**2,500**
DG-AS3 (D)	DG-AS3W (D)	2	12/20/2018	**0.38**	**0.19 J**	**1.2**	**2**	**2.2**	**1.1**	**0.77**	**1.8**	**0.23**	**1.2**	<0.10	**0.99**	**0.41**	**0.59**	**2.8**	**2,400**	**1,900**
DG-AS7	DG-AS7W	2	1/11/2019	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	**150 J**	<110
DG-AT5	DG-AT5W	2	12/20/2018	**0.19 J**	**0.18 J**	**0.78**	**0.84**	**0.93**	**0.55**	**0.38**	**0.84**	**0.16 J**	**1.1**	<0.10	**0.55**	<0.10 R	**0.52**	**1.3**	**240 J**	**220 J**

Table 8: Polynuclear Aromatic Hydrocarbons and TPH as Diesel and Motor Oil Concentrations in Fill
Brisbane Baylands OU-2
Brisbane, California

Sample Location	Sample Name	Investigation Zone	Collection Date	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenzo(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Naphthalene	Phenanthrene	Pyrene	TPH-Diesel (C10-C28)	TPH-Motor Oil (C24-C36)
Aquatic Habitat Goal Levels Saltwater Ecotox ESL [1]				1.5E+01	1.5E+01	1.5E+01	1.5E+01	1.5E+01	1.5E+01	1.5E+01	1.5E+01	1.5E+01	8.0E+00	1.5E+01	1.5E+01	1.5E+01	4.6E+00	1.5E+01	6.4E+02	--
Site Specific Screening Level [2]				1.5E+03	1.5E+03	1.5E+03	1.5E+03	1.5E+03	1.5E+03	1.5E+03	1.5E+03	1.5E+03	8.0E+02	1.5E+03	1.5E+03	1.5E+03	4.6E+02	1.5E+03	6.4E+04	--
Units				µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
DG-AU3	DG-AU3W	2	12/20/2018	**0.29**	**0.18 J**	**0.82**	**1.2**	**1.4**	**0.77**	**0.43**	**1.1**	**0.17 J**	**1.1**	**0.14 J**	**0.65**	**0.79**	**0.88**	**1.7**	**250 J**	**250 J**
DG-AU7	DG-AU7W	2	1/11/2019	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	**150 J**	<110 UJ
DG-AU7 (D)	DG-AU7 (D)W	2	1/11/2019	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	**160 J**	**110 J**
DG-AV5	DG-AV5W	2	12/20/2018	**0.11 J**	**0.34**	**0.19 J**	**0.2**	**0.33**	**0.19 J**	<0.10	**0.24**	<0.10	**0.67**	<0.10	**0.12 J**	**0.19 J**	**0.3**	**0.6**	**210 J**	**--**
DG-AW3	DG-AW3W	2	1/31/2019	**0.6**	**0.33**	**0.99**	**1.9**	**2**	**1.6**	**0.62**	**1.7**	**0.31**	**1.2**	<0.10	**1.2**	**1.1**	**0.59**	**2.5**	**310 J**	**210 J**
DG-AY3	DG-AY3W	2	2/1/2019	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	**540**	**530**
LF-5A	LF-5AW	2	12/19/2018	<0.41	<0.28	<0.62	<0.96	<0.33	<0.36	<0.30	<0.96	<0.38	<0.96	<0.47	<0.37	<0.96	<0.33	<0.30	**420**	**400**
MW-10A	MW-10AW	2	12/19/2018	<0.42	<0.28	<0.63	<0.97	<0.33	<0.36	<0.30	<0.97	<0.39	<0.97	<0.47	<0.38	<0.97	<0.33	<0.31	**230**	**150**
KMW-7A	KMW-7AW	2	12/19/2018	<0.41	<0.28	<0.62	<0.95	<0.32	<0.36	<0.29	<0.95	<0.38	<0.95	<0.46	<0.37	<0.95	<0.32	<0.30	**350**	**230**
DG-N9	DG-N9W	3	1/14/2019	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	**0.11 J**	<0.11	<0.11	<0.11	<0.11	**0.20 J**	**120 J**	**130 J**
DG-N13	DG-N13W	3	1/11/2019	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099 UJ	<0.099	<0.099 UJ	<0.099 UJ	<0.099	<0.099 UJ	<0.099 UJ	<0.099 UJ	<100	<100
DG-N13 (D)	DG-N13 (D)W	3	1/11/2019	<0.097	<0.097	<0.097	<0.097	<0.097	<0.097	<0.097	**0.11 J**	<0.097	**0.13 J**	**0.12 J**	<0.097	**0.35 J**	**0.54 J**	**0.18 J**	<110	<110
DG-O7	DG-O7W	3	1/10/2019	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	**0.10 J**	<0.10	<0.10	<0.10	<0.10	**0.12 J**	**1,200**	**1,100**
DG-O11	DG-O11W	3	1/14/2019	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	**0.12 J**	<110	<110
DG-O15	DG-O15W	3	1/11/2019	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	**480 U**	**480 U**
DG-P13	DG-P13W	3	1/11/2019	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<110 UJ	<110 UJ
DG-Q11	DG-Q11W	3	1/15/2019	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	**340 J**	**410 J**
DG-Q11 (D)	DG-Q11 (D)W	3	1/15/2019	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	**980 J**	**1,400 J**
DG-Q15	DG-Q15W	3	1/11/2019	<0.097	<0.097	<0.097	<0.097	<0.097	<0.097	<0.097	**0.11 J**	<0.097	<0.097	<0.097	<0.097	**0.16 J**	**0.34**	<0.097	**480 U**	**480 U**
DG-R9	DG-R9W	3	1/25/2019	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	**170 J**	<100
DG-R13	DG-R13W	3	1/29/2019	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	**170 J**	**160 J**
DG-S11	DG-S11W	3	1/15/2019	<0.22	<0.22	<0.22	**0.30 J+**	**0.42 J+**	**0.29 J+**	<0.22 UJ	**0.31 J**	<0.22 UJ	**0.42 J**	<0.22	<0.22 UJ	**0.23 J**	**0.31 J**	**0.55**	**550 J**	**--**
DG-S15	DG-S15W	3	1/11/2019	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	**250 J**	**210 J**
DG-S15 (D)	DG-S15 (D)W	3	1/11/2019	<0.097	<0.097	<0.097	<0.097	<0.097	<0.097	<0.097	<0.097	<0.097	<0.097	<0.097	<0.097	<0.097	<0.097	<0.097	**140 J**	**120 J**
DG-T9	DG-T9W	3	1/14/2019	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10 R	<0.10	<0.10	<110	<110
DG-T13	DG-T13W	3	1/15/2019	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	**160 J**	**150 J**
DG-U11	DG-U11W	3	1/15/2019	**0.38**	**2.2**	**0.52**	**0.20 J**	**0.27**	<0.11	**0.14 J**	**0.51**	<0.11	**3.2**	**3.7**	<0.11	**0.26**	**9.8**	**1.9**	**160 J**	<120
DG-U15	DG-U15W	3	1/28/2019	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	**0.20 J**	<0.20	<0.20	<0.20	<0.20	**0.39 J**	**2,700**	**2,700**
DG-V13	DG-V13W	3	1/15/2019	<0.22 UJ	<0.22	<0.22	<0.22 UJ	<0.22 UJ	<0.22 UJ	<0.22 UJ	<0.22	<0.22 UJ	**0.22 J**	<0.22 UJ	<0.22 UJ	<0.22	<0.22	**0.31 J**	**1,000**	**2,000**
DG-V17	DG-V17W	3	1/28/2019	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	**300 J**	**290 J**
MW-9A	MW-9AW	3	12/18/2018	<0.41	<0.28	<0.62	<0.95	<0.32	<0.36	<0.29	<0.95	<0.38	<0.95	<0.47	<0.37	<0.95	<0.32	<0.30	<28	<68
LF-3A	LF-3AW	3	12/18/2018	<0.41	<0.28	<0.62	<0.95	<0.32	<0.36	<0.29	<0.95	<0.38	<0.95	<0.47	<0.37	<0.95	<0.32	<0.30	<28	<68
LF-3A (D)	LF-3A (D)W	3	12/18/2018	<0.41	<0.28	<0.62	<0.95	<0.32	<0.36	<0.29	<0.95	<0.38	<0.95	<0.47	<0.37	<0.95	<0.32	<0.30	<28	<68
DG-W15	DG-W15W	4	1/29/2019	**0.43**	**0.12 J**	<0.10	**0.12 J**	**0.12 J**	**0.25**	<0.10	<0.10	<0.10	**0.49**	<0.10	**0.17 J**	**0.13 J**	**0.17 J**	**0.47**	**1,100**	**1,100**
DG-X13	DG-X13W	4	1/25/2019	**0.19 J**	**0.11 J**	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	**0.42**	<0.10	<0.10	**0.33**	**0.13 J**	**1,400**	**190 J**

Table 8: Polynuclear Aromatic Hydrocarbons and TPH as Diesel and Motor Oil Concentrations in Fill
Brisbane Baylands OU-2
Brisbane, California

Sample Location	Sample Name	Investigation Zone	Collection Date	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenzo(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Naphthalene	Phenanthrene	Pyrene	TPH-Diesel (C10-C28)	TPH-Motor Oil (C24-C36)
Aquatic Habitat Goal Levels Saltwater Ecotox ESL [1]				1.5E+01	1.5E+01	1.5E+01	1.5E+01	1.5E+01	1.5E+01	1.5E+01	1.5E+01	1.5E+01	8.0E+00	1.5E+01	1.5E+01	1.5E+01	4.6E+00	1.5E+01	6.4E+02	--
Site Specific Screening Level [2]				1.5E+03	1.5E+03	1.5E+03	1.5E+03	1.5E+03	1.5E+03	1.5E+03	1.5E+03	1.5E+03	8.0E+02	1.5E+03	1.5E+03	1.5E+03	4.6E+02	1.5E+03	6.4E+04	--
Units				µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
DG-X17	DG-X17W	4	1/28/2019	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	**1.1 J**	<1.1	<1.1	<1.1	<1.1	**1.7 J**	**2,000**	**490 J**
DG-Y11	DG-Y11W	4	1/22/2019	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**3.1**	<1.0	<1.0	**4.7**	<1.0	**6,900**	**530**
DG-Y15	DG-Y15W	4	2/1/2019	**0.64**	**0.16 J**	<0.10	<0.10	<0.10	<0.10	<0.10	**0.22**	<0.10	**0.26**	**0.82**	<0.10	**0.29**	**0.28**	**0.58**	**4,300**	**2,900**
DG-Y19	DG-Y19W	4	1/28/2019	**0.19 J**	**0.42**	**0.44**	**0.41**	**0.39**	**0.21**	**0.14 J**	**0.52**	<0.099	**0.89**	**0.33**	**0.21**	**0.32**	**1.5**	**1.1**	**560**	**300 J**
DG-Z17	DG-Z17W	4	1/28/2019	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	**0.26**	<0.10	**2,400**	**1,400**
DG-AA11	DG-AA11W	4	1/30/2019	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	**4.3**	<1.1	**1.9 J**	**3.5**	<1.1	**4,800**	**720**
DG-AA15	DG-AA15W	4	1/25/2019	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	**0.13 J**	**870**	**450 J**
DG-AA19	DG-AA19W	4	1/25/2019	<0.52	<0.52	<0.52	<0.52	<0.52	<0.52	<0.52	<0.52	<0.52	<0.52	<0.52	<0.52	**1.7**	**2.4**	<0.52	**12,000**	**990**
DG-AB13	DG-AB13W	4	1/25/2019	<0.10	**0.21 J**	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	**0.17 J**	<0.10	<0.10 UJ	**0.40 J**	**0.21 J**	**400 J**	<100 UJ
DG-AB13 (D)	DG-AB13 (D)W	4	1/25/2019	<0.10	**0.14 J**	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10 UJ	<0.10	<0.10 UJ	**0.12 J**	**0.12 J**	**600 J**	**100 J**
DG-AD13	DG-AD13W	4	2/1/2019	<1.0	**1.2 J**	<1.0	<1.0	<1.0	<1.0	<1.0	**1.3 J**	<1.0	<1.0	**3.6 J**	<1.0	**17 J**	**5.6 J**	**2.3 J**	**21,000**	**9,900**
DG-AD13 (D)	DG-AD13 (D)W	4	2/1/2019	<0.50	**0.80 J**	<0.50	<0.50	<0.50	<0.50	<0.50	**0.97 J**	<0.50	<0.50	**2.5 J**	<0.50	**27 J**	**3.8 J**	**1.4 J**	**18,000**	--
DG-AE11	DG-AE11W	4	1/22/2019	<1.0	**2.2**	<1.0	<1.0	<1.0	<1.0	<1.0	**1.5 J**	<1.0	**1.0 J**	**5.5**	<1.0	**4.3**	**10**	**4.2**	**11,000**	**1,700**
DG-AG11	DG-AG11W	4	1/22/2019	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	**2.7 J**	**5.6**	<2.1	<2.1	**10**	**5.2**	**7,400**	**1,300**
DG-AH13	DG-AH13W	4	1/29/2019	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**14,000**	**6,300**
DG-AJ13	DG-AJ13W	4	1/29/2019	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**4,700**	--
DG-AK11	DG-AK11W	4	1/29/2019	<2.0	**2.2 J**	<2.0	**2.3 J**	**2.4 J**	**2.4 J**	<2.0	**3.3 J**	<2.0	**4.0 J**	**4.8**	<2.0	**3.1 J**	**8.3**	**5.7**	**8,000**	**2,900**
DG-AL13	DG-AL13W	4	1/29/2019	<0.41	<0.41	<0.41	<0.41	<0.41	<0.41	<0.41	<0.41	<0.41	<0.41	<0.41	<0.41	<0.41	<0.41	<0.41	**5,300**	**1,900**
DG-AN13	DG-AN13W	4	2/1/2019	<0.52	<0.52	<0.52	<0.52	<0.52	<0.52	<0.52	<0.52	<0.52	<0.52	<0.52	<0.52	<0.52	<0.52	<0.52	**1,300**	**460 J**
MW-15A	MW-15AW	4	12/18/2018	<0.44	<0.30	<0.67	<1.0	<0.35	<0.39	<0.32	<1.0	<0.41	<1.0	<0.51	<0.40	<1.0	<0.35	<0.33	**4,700**	**2,400**
MW-17A	MW-17AW	4	12/18/2018	<0.42	<0.29	<0.64	<0.98	<0.33	<0.37	<0.30	<0.98	<0.39	<0.98	<0.48	<0.38	<0.98	<0.33	<0.31	**370**	**250**
MW-17A (D)	MW-17A (D)W	4	12/18/2018	<0.42	<0.29	<0.64	<0.98	<0.33	<0.37	<0.30	<0.98	<0.39	<0.98	<0.48	<0.38	<0.98	<0.33	<0.31	**380**	--
LF-4A	LF-4AW	4	12/18/2018	<0.42	<0.29	<0.64	<0.98	<0.33	<0.37	<0.30	<0.98	<0.39	<0.98	<0.48	<0.38	<0.98	<0.34	<0.31	**5,300**	**1,800**
LF-8A	LF-8AW	4	12/19/2018	<0.42	<0.28	<0.63	<0.97	<0.33	<0.37	<0.30	<0.97	<0.39	<0.97	<0.48	<0.38	<0.97	<0.33	<0.31	**4,900**	**1,400**
DG-AQ11	DG-AQ11W	5	1/31/2019	<0.51	<0.51	<0.51	<0.51	<0.51	<0.51	<0.51	<0.51	<0.51	<0.51	<0.51	<0.51	<0.51	<0.51	<0.51	**620**	**500 J**
DG-AT9	DG-AT9W	5	1/31/2019	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	**170 J**	**130 J**
DG-AV9	DG-AV9W	5	2/1/2019	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	**0.13 J**	<0.10	<0.10	<0.10	<0.10	**0.15 J**	**230 J**	**220 J**
DG-AX5	DG-AX5W	5	12/20/2018	<0.099	<0.099	<0.099	**0.13 J**	**0.16 J**	<0.099	<0.099	**0.12 J**	<0.099	**0.23**	<0.099	<0.099	<0.099	**0.16 J**	**0.5**	**1,000**	**920 J**
MK-7A	MK-7AW	5	12/19/2018	<0.42	<0.28	<0.63	<0.97	<0.33	<0.37	<0.30	<0.97	<0.39	<0.97	<0.47	<0.38	<0.97	<0.33	<0.31	**190**	**140**
LF-7A	LF-7AW	5	12/19/2018	<0.41	<0.28	<0.62	<0.95	<0.32	<0.36	<0.30	<0.95	<0.38	<0.95	<0.47	<0.37	<0.95	<0.33	<0.30	**99**	<68
MK-8A	MK-8AW	5	12/19/2018	<0.42	<0.28	<0.63	<0.97	<0.33	<0.37	<0.30	<0.97	<0.39	<0.97	<0.48	<0.38	<0.97	<0.33	<0.31	<29	<70
DG-AB17	DG-AB17W	6	1/25/2019	**0.18 J**	**0.22 J**	<0.11	<0.11	<0.11	<0.11	<0.11	**0.12 J**	<0.11	**0.5**	**0.14 J**	<0.11	**0.25**	**0.32**	**0.53**	**1,100**	**630**
DG-AC15	DG-AC15W	6	2/1/2019	**0.24 J**	**0.55**	**0.77**	**1.5**	**1.3**	**1.5**	**0.38 J**	**1.1**	<0.20	**3.7**	**1.3**	**1.2**	**8.2**	**1.5**	**4.3**	**6,600**	**3,700**
DG-AD17	DG-AD17W	6	1/25/2019	<0.11	**0.56**	**0.16 J**	<0.11	**0.14 J**	<0.11	<0.11	**0.21**	<0.11	**1.6**	**1.3**	<0.11	**1.2**	**1.6**	**0.79**	**2,200**	**2,500**
DG-AG15	DG-AG15W	6	1/24/2019	<2.9	<2.9	<2.9	<2.9	<2.9	<2.9	<2.9	<2.9	<2.9	<2.9	<2.9	<2.9	<2.9	<2.9	<2.9	**1,700**	<200

Table 8: Polynuclear Aromatic Hydrocarbons and TPH as Diesel and Motor Oil Concentrations in Fill
Brisbane Baylands OU-2
Brisbane, California

Sample Location	Sample Name	Investigation Zone	Collection Date	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenzo(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Naphthalene	Phenanthrene	Pyrene	TPH-Diesel (C10-C28)	TPH-Motor Oil (C24-C36)
Aquatic Habitat Goal Levels Saltwater Ecotox ESL [1]				1.5E+01	1.5E+01	1.5E+01	1.5E+01	1.5E+01	1.5E+01	1.5E+01	1.5E+01	1.5E+01	8.0E+00	1.5E+01	1.5E+01	1.5E+01	4.6E+00	1.5E+01	6.4E+02	--
Site Specific Screening Level [2]				1.5E+03	1.5E+03	1.5E+03	1.5E+03	1.5E+03	1.5E+03	1.5E+03	1.5E+03	1.5E+03	8.0E+02	1.5E+03	1.5E+03	1.5E+03	4.6E+02	1.5E+03	6.4E+04	--
Units				µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
DG-AI15	DG-AI15W	6	1/25/2019	<0.52	<0.52	<0.52	<0.52	<0.52	<0.52	<0.52	<0.52	<0.52	<0.52	<0.52	<0.52	**11**	<0.52	<0.52	**4,700**	**360 J**
DG-AK15	DG-AK15W	6	1/24/2019	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	**41 J**	<25	<25	**6,500**	**610**
DG-AM15	DG-AM15W	6	1/24/2019	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	**110 J**	<110
DG-AS11	DG-AS11W	6	1/31/2019	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	**260 J**	**300 J**
DG-AW11	DG-AW11W	6	1/24/2019	<0.10	<0.10	**0.14 J**	**0.20 J**	**0.19 J**	**0.21**	<0.10	**0.17 J**	<0.10	**0.43**	<0.10	**0.21**	<0.10	**0.15 J**	**0.55**	**1,100**	**500 J**
DG-AW11 (D)	DG-AW11 (D)W	6	1/24/2019	<0.10	<0.10	**0.14 J**	**0.20 J**	**0.19 J**	**0.22**	<0.10	**0.16 J**	<0.10	**0.36**	<0.10	**0.22**	<0.10	**0.12 J**	**0.46**	**1,100**	**500 J**
MW-13A	MW-13AW	6	12/18/2018	<0.42	<0.28	<0.63	<0.97	<0.33	<0.37	<0.30	<0.97	<0.39	<0.97	<0.48	<0.38	<0.97	<0.33	<0.31	**1,300**	--

Notes:

1. San Francisco Bay RWQCB, 2019. Summary of Groundwater ESLs, Jan. 2019 (Rev. 1) - Aquatic Habitat Goal Levels (Table GW-2): Saltwater Ecotoxicity.
2. Site specific screening level is the saltwater ecotoxicity ESL with a 100-fold attenuation factor.
- PAHs were analyzed by USEPA Method 8270C SIM.
- Non-detect results are presented with "<" followed by the MDL.
- Results in bold font indicate a detection above the MDL.
- Gray shading indicates a detection above the comparison criteria.

Abbreviations and Symbols:

"J" - Analyte was detected but the associated numerical value is the approximate concentration.
"J+" - Analyte was detected but the associated numerical value is likely to be higher than the concentration of the analyte in the sample due to positive bias of associated QC or calibration data or attributable to matrix interference.
"J-" - Analyte was detected but the associated numerical value is likely to be lower than the concentration of the analyte in the sample due to negative bias of associated QC or calibration data or attributable to matrix interference.
"R" - The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.
"U" - Not detected at or above the reported result.
"UJ" - The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
"--" - Not Available
"<" - Non-detect result
(D) - Duplicate sample
µg/L - microgram per liter
ESL - Environmental Screening Level
MDL - Method Detection Limit
PAHs - Polynuclear Aromatic Hydrocarbons
QC - quality control
RWQCB - Regional Water Quality Control Board
TPH - Total petroleum hydrocarbons
USEPA - United States Environmental Protection Agency

Table 9: Volatile Organic Compounds and Total Petroleum Hydrocarbon Concentrations as Gasoline in Fill
Brisbane Baylands OU-2
Brisbane, California

Sample Location	Investigation Zone	Sample Name	Collection Date	1,1,1-Trichloroethane	1,1,2-Trichloro-1,2,2-trifluoroethane	1,1-Dichloroethane	1,1-Dichloroethene	1,2,3-Trichlorobenzene	1,2,4-Trimethylbenzene	1,2-Dichlorobenzene	1,3,5-Trimethylbenzene	4-Isopropyltoluene	Acetone	Benzene	Chloroethane	cis-1,2-Dichloroethene	Ethylbenzene	Isopropylbenzene	Methyl-tert-butyl ether (MTBE)	Naphthalene	n-Butylbenzene
Aquatic Habitat Goal Levels Saltwater Ecotox ESL [1]				3.1E+03	--	-	2.2E+04	--	--	6.5E+01	--	--	--	3.5E+02	-	2.2E+04	4.3E+01	--	8.0E+03	1.5E+01	--
Site Specific Screening Level [2]				3.1E+05	--	--	2.2E+06	--	--	6.5E+03	--	--	--	3.5E+04	--	2.2E+06	4.3E+03	--	8.0E+05	1.5E+03	--
Vapor Intrusion Human Health Risk Residential ESL [3]				1.5E+03	--	7.6E+00	6.6E+01	--	--	2.7E+03	--	--	2.3E+07	4.2E-01	2.3E+04	4.9E+01	3.5E+00	--	4.5E+02	4.6E+00	--
Units				µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
DG-AA3	1	DG-AA3W	12/18/2018	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	**1.7**	<0.40	<0.40
DG-AA7	1	DG-AA7W	1/11/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40
DG-AB5	1	DG-AB5W	1/31/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40
DG-AB5 (D)	1	DG-AB5 (D)W	1/31/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40
DG-AC3	1	DG-AC3W	12/19/2018	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	**2.6**	<0.40	<0.40
DG-AC7	1	DG-AC7W	1/11/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40
DG-AC7 (D)	1	DG-AC7 (D)W	1/11/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40
DG-AD5	1	DG-AD5W	1/7/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40
DG-AD9	1	DG-AD9W	1/11/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40
DG-AE3	1	DG-AE3W	12/19/2018	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	**3.7**	<0.40	<0.40
DG-AE7	1	DG-AE7W	1/11/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40
DG-AF5	1	DG-AF5W	1/7/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	**0.82**	<0.40	<0.40
DG-AG3	1	DG-AG3W	12/19/2018	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	**15**	<0.25	<0.40	<0.25	<0.25	<0.25	**7.9**	<0.40	<0.40
DG-AG7	1	DG-AG7W	1/31/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	**0.54**	<0.40	<0.40
DG-N5	1	DG-N5W	1/10/2019	<0.25	<0.50	<0.25	<0.25	**0.41 J**	<0.25	<0.25	<0.25	<0.25	**20 U**	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	**0.45 J**	<0.40
DG-O3	1	DG-O3W	12/18/2018	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40
DG-P5	1	DG-P5W	1/10/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40
DG-Q7	1	DG-Q7W	1/10/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	**0.29 J**	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40
DG-Q7 (D)	1	DG-Q7 (D)W	1/10/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	**0.29 J**	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40
DG-R1	1	DG-R1W	12/17/2018	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40
DG-R5	1	DG-R5W	1/30/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40
DG-S3	1	DG-S3W	12/18/2018	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40
DG-S7	1	DG-S7W	1/10/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	**20 U**	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40
DG-T1	1	DG-T1W	12/17/2018	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40
DG-T5	1	DG-T5W	1/7/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40
DG-U3	1	DG-U3W	12/18/2018	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	**0.33**	<0.25	<0.25	<0.25	<0.40	<0.40
DG-U3 (D)	1	DG-U3 (D)W	12/18/2018	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40
DG-U7	1	DG-U7W	1/10/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40
DG-V1	1	DG-V1W	12/17/2018	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40
DG-V5	1	DG-V5W	1/7/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40
DG-V9	1	DG-V9W	1/14/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40
DG-W3	1	DG-W3W	12/18/2018	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40
DG-W7	1	DG-W7W	1/30/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40

Table 9: Volatile Organic Compounds and Total Petroleum Hydrocarbon Concentrations as Gasoline in Fill
Brisbane Baylands OU-2
Brisbane, California

Sample Location	Investigation Zone	Sample Name	Collection Date	1,1,1-Trichloroethane	1,1,2-Trichloro-1,2,2-trifluoroethane	1,1-Dichloroethane	1,1-Dichloroethene	1,2,3-Trichlorobenzene	1,2,4-Trimethylbenzene	1,2-Dichlorobenzene	1,3,5-Trimethylbenzene	4-Isopropyltoluene	Acetone	Benzene	Chloroethane	cis-1,2-Dichloroethene	Ethylbenzene	Isopropylbenzene	Methyl-tert-butyl ether (MTBE)	Naphthalene	n-Butylbenzene
Aquatic Habitat Goal Levels Saltwater Ecotox ESL [1]				3.1E+03	--	-	2.2E+04	--	--	6.5E+01	--	--	--	3.5E+02	-	2.2E+04	4.3E+01	--	8.0E+03	1.5E+01	--
Site Specific Screening Level [2]				3.1E+05	--	--	2.2E+06	--	--	6.5E+03	--	--	--	3.5E+04	--	2.2E+06	4.3E+03	--	8.0E+05	1.5E+03	--
Vapor Intrusion Human Health Risk Residential ESL [3]				1.5E+03	--	7.6E+00	6.6E+01	--	--	2.7E+03	--	--	2.3E+07	4.2E-01	2.3E+04	4.9E+01	3.5E+00	--	4.5E+02	4.6E+00	--
Units				µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
DG-X1	1	DG-X1W	12/17/2018	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	**1.3**	<0.40	<0.40
DG-X5	1	DG-X5W	1/7/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	**20 U**	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40
DG-X9	1	DG-X9W	1/14/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40
DG-Y3	1	DG-Y3W	12/18/2018	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	**0.39**	<0.40	<0.40
DG-Y7	1	DG-Y7W	1/11/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40
DG-Z5	1	DG-Z5W	1/7/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40
DG-Z9	1	DG-Z9W	1/15/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40
KMW-4A	1	KMW-4AW	12/18/2018	<0.20	<0.091	<0.11	<0.20	<0.21	<0.20	<0.21	<0.17	<0.20	<20	<0.25	<0.17	<0.076	<0.13	<0.20	**6.5**	<0.22	<0.30
MW-11AR	1	MW-11ARW	12/18/2018	<0.20	<0.091	<0.11	<0.20	<0.21	<0.20	<0.21	<0.17	<0.20	<20	<0.25	<0.17	<0.076	<0.13	<0.20	<0.11	<0.22	<0.30
DG-AH5	2	DG-AH5W	1/7/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	**20 U**	<0.25	<0.40	<0.25	<0.25	<0.25	**0.30 J**	<0.40	<0.40
DG-AI3	2	DG-AI3W	12/19/2018	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	**6.2**	<0.40	<0.40
DG-AI3 (D)	2	DG-AI3 (D)W	12/19/2018	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	**6**	<0.40	<0.40
DG-AI7	2	DG-AI7W	1/11/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40
DG-AJ5	2	DG-AJ5W	1/7/2019	<0.25 R	<0.50 R	<0.25 R	<0.25 R	<0.40 R	<0.25 R	<0.25 R	<0.25 R	<0.25 R	<10 R	<0.25 R	<0.40 R	<0.25 R	<0.25 R	<0.25 R	**5.4 J**	<0.40 R	<0.40 R
DG-AK3	2	DG-AK3W	12/19/2018	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	**6.7**	<0.40	<0.40
DG-AK7	2	DG-AK7W	1/11/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	**0.77**	<0.40	<0.40
DG-AK7 (D)	2	DG-AK7 (D)W	1/11/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	**0.76**	<0.40	<0.40
DG-AL5	2	DG-AL5W	1/31/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	**3**	<0.40	<0.40
DG-AL9	2	DG-AL9W	1/22/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10 R	<0.25	<0.40	<0.25	<0.25	<0.25	**0.9**	<0.40	<0.40
DG-AM3	2	DG-AM3W	12/19/2018	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	**7.2**	<0.40	<0.40
DG-AM7	2	DG-AM7W	1/11/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	**1.6**	<0.40	<0.40
DG-AN5	2	DG-AN5W	12/20/2018	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	**4**	<0.40	<0.40
DG-AN9	2	DG-AN9W	1/21/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	**20 U**	<0.25	<0.40	<0.25	<0.25	<0.25	**1.4**	<0.40	<0.40
DG-AO3	2	DG-AO3W	12/19/2018	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	**10**	<0.25	<0.40	<0.25	<0.25	<0.25	**7.3**	<0.40	<0.40
DG-AO7	2	DG-AO7W	1/11/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	**2.4**	<0.40	<0.40
DG-AP5	2	DG-AP5W	12/20/2018	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	**5**	<0.40	<0.40
DG-AP9	2	DG-AP9W	1/21/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	**20 U**	<0.25	<0.40	<0.25	<0.25	<0.25	**1.6**	<0.40	<0.40
DG-AQ3	2	DG-AQ3W	12/19/2018	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	**6.1**	<0.40	<0.40
DG-AQ7	2	DG-AQ7W	1/31/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	**4.5**	<0.40	<0.40
DG-AR5	2	DG-AR5W	12/20/2018	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	**4.8**	<0.40	<0.40
DG-AR9	2	DG-AR9W	1/11/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	**1.2**	<0.40	<0.40
DG-AR9 (D)	2	DG-AR9 (D)W	1/11/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	**1.3**	<0.40	<0.40
DG-AS3	2	DG-AS3W	12/20/2018	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	**1.5**	<0.40	<0.40

Table 9: Volatile Organic Compounds and Total Petroleum Hydrocarbon Concentrations as Gasoline in Fill
Brisbane Baylands OU-2
Brisbane, California

Sample Location	Investigation Zone	Sample Name	Collection Date	1,1,1-Trichloroethane	1,1,2-Trichloro-1,2,2-trifluoroethane	1,1-Dichloroethane	1,1-Dichloroethene	1,2,3-Trichlorobenzene	1,2,4-Trimethylbenzene	1,2-Dichlorobenzene	1,3,5-Trimethylbenzene	4-Isopropyltoluene	Acetone	Benzene	Chloroethane	cis-1,2-Dichloroethene	Ethylbenzene	Isopropylbenzene	Methyl-tert-butyl ether (MTBE)	Naphthalene	n-Butylbenzene
Aquatic Habitat Goal Levels Saltwater Ecotox ESL [1]				3.1E+03	--	-	2.2E+04	--	--	6.5E+01	--	--	--	3.5E+02	-	2.2E+04	4.3E+01	--	8.0E+03	1.5E+01	--
Site Specific Screening Level [2]				3.1E+05	--	--	2.2E+06	--	--	6.5E+03	--	--	--	3.5E+04	--	2.2E+06	4.3E+03	--	8.0E+05	1.5E+03	--
Vapor Intrusion Human Health Risk Residential ESL [3]				1.5E+03	--	7.6E+00	6.6E+01	--	--	2.7E+03	--	--	2.3E+07	4.2E-01	2.3E+04	4.9E+01	3.5E+00	--	4.5E+02	4.6E+00	--
Units				µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
DG-AS3 (D)	2	DG-AS3 (D)W	12/20/2018	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	**1.5**	<0.40	<0.40
DG-AS7	2	DG-AS7W	1/11/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	**2.2**	<0.40	<0.40
DG-AT5	2	DG-AT5W	12/20/2018	<0.25 R	<0.50 R	<0.25 R	<0.25 R	<0.40 R	<0.25 R	<0.25 R	<0.25 R	<0.25 R	**20 U**	<0.25 R	<0.40 R	<0.25 R	<0.25 R	<0.25 R	**1.9 J**	<0.40 R	<0.40 R
DG-AU3	2	DG-AU3W	12/20/2018	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	**0.48 J**	<0.40	<0.40
DG-AU7	2	DG-AU7W	1/11/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	**2.5**	<0.40	<0.40
DG-AU7 (D)	2	DG-AU7 (D)W	1/11/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	**2.4**	<0.40	<0.40
DG-AV5	2	DG-AV5W	12/20/2018	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	**2.7**	<0.40	<0.40
DG-AW3	2	DG-AW3W	1/31/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	**4.1**	<0.40	<0.40
DG-AY3	2	DG-AY3W	2/1/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	**4.1**	<0.40	<0.40
KMW-7A	2	KMW-7AW	12/19/2018	<0.20	<0.091	<0.11	<0.20	<0.21	<0.20	<0.21	<0.17	<0.20	<20	<0.25	<0.17	<0.076	<0.13	<0.20	**6.1**	<0.22	<0.30
LF-5A	2	LF-5AW	12/19/2018	<0.20	<0.091	<0.11	<0.20	<0.21	<0.20	<0.21	<0.17	<0.20	<20	<0.25	<0.17	<0.076	<0.13	<0.20	<0.11	<0.22	<0.30
MW-10A	2	MW-10AW	12/19/2018	<0.20	<0.091	<0.11	<0.20	<0.21	<0.20	<0.21	<0.17	<0.20	<20	<0.25	<0.17	<0.076	<0.13	<0.20	**3.3**	<0.22	<0.30
DG-N13	3	DG-N13W	1/11/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	**10 J**	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40 UJ	<0.40
DG-N13 (D)	3	DG-N13 (D)W	1/11/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10 UJ	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40
DG-N9	3	DG-N9W	1/14/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	**2**	<0.25	<0.25	<0.25	<0.40	<0.40
DG-O11	3	DG-O11W	1/14/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40
DG-O15	3	DG-O15W	1/11/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40
DG-O7	3	DG-O7W	1/10/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	**20 U**	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40
DG-P13	3	DG-P13W	1/11/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40
DG-Q11	3	DG-Q11W	1/15/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	**0.56**	<0.25	<0.25	<0.25	<0.40	<0.40
DG-Q11 (D)	3	DG-Q11 (D)W	1/15/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	**0.7**	<0.25	<0.25	<0.25	<0.40	<0.40
DG-Q15	3	DG-Q15W	1/11/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40
DG-R13	3	DG-R13W	1/29/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40
DG-R9	3	DG-R9W	1/25/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	**24 U**	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40
DG-S11	3	DG-S11W	1/15/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40
DG-S15	3	DG-S15W	1/11/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40
DG-S15 (D)	3	DG-S15 (D)W	1/11/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40
DG-T13	3	DG-T13W	1/15/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40
DG-T17	3	DG-T17W	1/31/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	**21 U**	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40
DG-T9	3	DG-T9W	1/14/2019	<0.25 R	<0.50 R	<0.25 R	<0.25 R	<0.40 R	<0.25 R	<0.25 R	<0.25 R	<0.25 R	**18 J**	<0.25 R	<0.40 R	<0.25 R	<0.25 R	<0.25 R	<0.25 R	<0.40 R	<0.40 R
DG-U11	3	DG-U11W	1/15/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40
DG-U15	3	DG-U15W	1/28/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40
DG-V13	3	DG-V13W	1/15/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40

Table 9: Volatile Organic Compounds and Total Petroleum Hydrocarbon Concentrations as Gasoline in Fill
Brisbane Baylands OU-2
Brisbane, California

Sample Location	Investigation Zone	Sample Name	Collection Date	1,1,1-Trichloroethane	1,1,2-Trichloro-1,2,2-trifluoroethane	1,1-Dichloroethane	1,1-Dichloroethene	1,2,3-Trichlorobenzene	1,2,4-Trimethylbenzene	1,2-Dichlorobenzene	1,3,5-Trimethylbenzene	4-Isopropyltoluene	Acetone	Benzene	Chloroethane	cis-1,2-Dichloroethene	Ethylbenzene	Isopropylbenzene	Methyl-tert-butyl ether (MTBE)	Naphthalene	n-Butylbenzene
Aquatic Habitat Goal Levels Saltwater Ecotox ESL [1]				3.1E+03	--	-	2.2E+04	--	--	6.5E+01	--	--	--	3.5E+02	-	2.2E+04	4.3E+01	--	8.0E+03	1.5E+01	--
Site Specific Screening Level [2]				3.1E+05	--	--	2.2E+06	--	--	6.5E+03	--	--	--	3.5E+04	--	2.2E+06	4.3E+03	--	8.0E+05	1.5E+03	--
Vapor Intrusion Human Health Risk Residential ESL [3]				1.5E+03	--	7.6E+00	6.6E+01	--	--	2.7E+03	--	--	2.3E+07	4.2E-01	2.3E+04	4.9E+01	3.5E+00	--	4.5E+02	4.6E+00	--
Units				µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
DG-V17	3	DG-V17W	1/28/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40
LF-3A	3	LF-3AW	12/18/2018	<0.20	<0.091	<0.11	<0.20	<0.21	<0.20	<0.21	<0.17	<0.20	<20	<0.25	<0.17	<0.076	<0.13	<0.20	<0.11	<0.22	<0.30
LF-3A (D)	3	LF-3A (D)W	12/18/2018	<0.20	<0.091	<0.11	<0.20	<0.21	<0.20	<0.21	<0.17	<0.20	<20	<0.25	<0.17	<0.076	<0.13	<0.20	<0.11	<0.22	<0.30
MW-9A	3	MW-9AW	12/18/2018	<0.20	<0.091	<0.11	<0.20	<0.21	<0.20	<0.21	<0.17	<0.20	<20	<0.25	<0.17	<0.076	<0.13	<0.20	<0.11	<0.22	<0.30
DG-AA11	4	DG-AA11W	1/30/2019	<0.25	<0.50	**1.3**	<0.25	<0.40	**0.65**	<0.25	<0.25	<0.25	<10	<0.25	**4.5**	**0.52**	<0.25	**0.25 J**	<0.25	<0.40	**0.73 J**
DG-AA15	4	DG-AA15W	1/25/2019	**1.3**	<0.50	**5.2**	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	**10**	**3.6**	<0.25	<0.25	<0.25	<0.40	<0.40
DG-AA19	4	DG-AA19W	1/25/2019	<0.25 UJ	<0.50 UJ	<0.25 UJ	<0.25 UJ	<0.40 UJ	<0.25 UJ	<0.25 UJ	<0.25 UJ	<0.25 UJ	<10 UJ	<0.25 UJ	<0.40 UJ	<0.25 UJ	<0.25 UJ	<0.25 UJ	<0.25 UJ	<0.40 UJ	<0.40 UJ
DG-AB13	4	DG-AB13W	1/25/2019	<0.25 UJ	<0.50 UJ	<0.25 UJ	<0.25 UJ	<0.40 UJ	<0.25 UJ	<0.25 UJ	<0.25 UJ	<0.25 UJ	<10 UJ	<0.25 UJ	<0.40 UJ	<0.25 UJ	<0.25 UJ	<0.25 UJ	<0.25 UJ	<0.40 UJ	<0.40 UJ
DG-AB13 (D)	4	DG-AB13 (D)W	1/25/2019	<0.25 UJ	<0.50 UJ	<0.25 UJ	<0.25 UJ	<0.40 UJ	<0.25 UJ	<0.25 UJ	<0.25 UJ	<0.25 UJ	<10 UJ	<0.25 UJ	<0.40 UJ	<0.25 UJ	<0.25 UJ	<0.25 UJ	<0.25 UJ	<0.40 UJ	<0.40 UJ
DG-AD13	4	DG-AD13W	2/1/2019	<0.25	<0.50	<0.25	<0.25	<0.40	**4.9 J**	<0.25	**1.2 J**	**0.38 J**	**20 U**	**5.1 J**	<0.40	<0.25	**5.3 J**	**0.63 J**	<0.25	**18 J**	<0.40
DG-AD13 (D)	4	DG-AD13 (D)W	2/1/2019	<0.25	<0.50	<0.25	<0.25	<0.40	**3.4 J**	<0.25	**0.86 J**	<0.25 UJ	**20 U**	**3.7 J**	<0.40	<0.25	**3.7 J**	**0.43 J**	<0.25	**13 J**	<0.40
DG-AE11	4	DG-AE11W	1/22/2019	<0.25	<0.50	<0.25	<0.25	<0.40	**0.25 J**	<0.25	<0.25	**0.29 J**	**20 U**	**0.78**	<0.40	<0.25	**0.27 J**	**0.98**	<0.25	**2.2**	**0.48 J**
DG-AG11	4	DG-AG11W	1/22/2019	<0.25	<0.50	<0.25	<0.25	<0.40	**0.29 J**	<0.25	<0.25	<0.25	<10	**1.5**	<0.40	<0.25	<0.25	**1.4**	<0.25	<0.40	**0.50 J**
DG-AH13	4	DG-AH13W	1/29/2019	<0.25	<0.50	<0.25	<0.25	<0.40	**0.31 J**	<0.25	<0.25	<0.25	<10	**7.1**	<0.40	<0.25	**0.52**	**1.6**	**0.30 J**	<0.40	**0.50 J**
DG-AJ13	4	DG-AJ13W	1/29/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	**0.77**	<0.40	<0.40
DG-AK11	4	DG-AK11W	1/29/2019	<0.25	<0.50	<0.25	<0.25	<0.40	**0.83**	<0.25	<0.25	**0.26 J**	<10	**1.5**	<0.40	<0.25	<0.25	**0.48 J**	**1.3**	**2.1**	<0.40
DG-AL13	4	DG-AL13W	1/29/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	**0.35 J**	<0.40	<0.25	<0.25	<0.25	**4**	<0.40	<0.40
DG-AN13	4	DG-AN13W	2/1/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	**0.31 J**	<0.40	<0.25	<0.25	<0.25	<0.25	**0.82 J**	<0.40
DG-W11	4	DG-W11W	1/30/2019	<0.25 R	<0.50 R	<0.25 R	<0.25 R	<0.40 R	<0.25 R	<0.25 R	<0.25 R	<0.25 R	<10 R	<0.25 R	<0.40 R	<0.25 R	<0.25 R	<0.25 R	<0.25 R	<0.40 R	<0.40 R
DG-W15	4	DG-W15W	1/29/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40
DG-X13	4	DG-X13W	1/25/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40
DG-X17	4	DG-X17W	1/28/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40
DG-Y11	4	DG-Y11W	1/22/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40
DG-Y15	4	DG-Y15W	2/1/2019	**18**	<0.50	**52**	**0.44 J**	<0.40	<0.25	**0.25 J**	<0.25	<0.25	<10	<0.25	**77**	**45**	<0.25	<0.25	<0.25	<0.40	<0.40
DG-Y19	4	DG-Y19W	1/28/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40
DG-Z17	4	DG-Z17W	1/28/2019	<0.25	<0.50	**0.26 J**	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	**0.43 J**	<0.40
LF-4A	4	LF-4AW	12/18/2018	<0.20	<0.091	<0.11	<0.20	<0.21	<0.20	<0.21	<0.17	<0.20	<20	<0.25	<0.17	<0.076	<0.13	<0.20	<0.11	<0.22	<0.30
LF-8A	4	LF-8AW	12/19/2018	<0.20	<0.091	<0.11	<0.20	<0.21	<0.20	<0.21	<0.17	<0.20	<20	<0.25	<0.17	<0.076	<0.13	<0.20	**5.3**	<0.22	<0.30
MW-15A	4	MW-15AW	12/18/2018	<0.20	<0.091	<0.11	<0.20	<0.21	<0.20	<0.21	<0.17	<0.20	<20	<0.25	<0.17	<0.076	<0.13	<0.20	<0.11	<0.22	<0.30
MW-17A	4	MW-17AW	12/18/2018	<0.20	<0.091	<0.11	<0.20	<0.21	<0.20	<0.21	<0.17	<0.20	<20	<0.25	<0.17	<0.076	<0.13	<0.20	<0.11	<0.22	<0.30
MW-17A (D)	4	MW-17A (D)W	12/18/2018	<0.20	<0.091	<0.11	<0.20	<0.21	<0.20	<0.21	<0.17	<0.20	<20	<0.25	<0.17	<0.076	<0.13	<0.20	<0.11	<0.22	<0.30
DG-AO11	5	DG-AO11W	1/31/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	**1.5**	<0.40	<0.40
DG-AQ11	5	DG-AQ11W	1/31/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	**0.36 J**	<0.40	<0.40

Table 9: Volatile Organic Compounds and Total Petroleum Hydrocarbon Concentrations as Gasoline in Fill
Brisbane Baylands OU-2
Brisbane, California

Sample Location	Investigation Zone	Sample Name	Collection Date	1,1,1-Trichloroethane	1,1,2-Trichloro-1,2,2-trifluoroethane	1,1-Dichloroethane	1,1-Dichloroethene	1,2,3-Trichlorobenzene	1,2,4-Trimethylbenzene	1,2-Dichlorobenzene	1,3,5-Trimethylbenzene	4-Isopropyltoluene	Acetone	Benzene	Chloroethane	cis-1,2-Dichloroethene	Ethylbenzene	Isopropylbenzene	Methyl-tert-butyl ether (MTBE)	Naphthalene	n-Butylbenzene
Aquatic Habitat Goal Levels Saltwater Ecotox ESL [1]				3.1E+03	--	-	2.2E+04	--	--	6.5E+01	--	--	--	3.5E+02	-	2.2E+04	4.3E+01	--	8.0E+03	1.5E+01	--
Site Specific Screening Level [2]				3.1E+05	--	--	2.2E+06	--	--	6.5E+03	--	--	--	3.5E+04	--	2.2E+06	4.3E+03	--	8.0E+05	1.5E+03	--
Vapor Intrusion Human Health Risk Residential ESL [3]				1.5E+03	--	7.6E+00	6.6E+01	--	--	2.7E+03	--	--	2.3E+07	4.2E-01	2.3E+04	4.9E+01	3.5E+00	--	4.5E+02	4.6E+00	--
Units				µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
DG-AT9	5	DG-AT9W	1/31/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	**2**	<0.40	<0.40
DG-AV9	5	DG-AV9W	2/1/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40
DG-AX5	5	DG-AX5W	12/20/2018	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40
LF-7A	5	LF-7AW	12/19/2018	<0.20	<0.091	<0.11	<0.20	<0.21	<0.20	<0.21	<0.17	<0.20	<20	<0.25	<0.17	<0.076	<0.13	<0.20	**2**	<0.22	<0.30
MK-7A	5	MK-7AW	12/19/2018	<0.20	<0.091	<0.11	<0.20	<0.21	<0.20	<0.21	<0.17	<0.20	<20	<0.25	<0.17	<0.076	<0.13	<0.20	**1**	<0.22	<0.30
MK-8A	5	MK-8AW	12/19/2018	<0.20	<0.091	<0.11	<0.20	<0.21	<0.20	<0.21	<0.17	<0.20	<20	<0.25	<0.17	<0.076	<0.13	<0.20	<0.11	<0.22	<0.30
DG-AB17	6	DG-AB17W	1/25/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	**0.43 J**	<0.40
DG-AC15	6	DG-AC15W	2/1/2019	<0.25	<0.50	<0.25	<0.25	<0.40	**4**	<0.25	**1**	**0.40 J**	<10	**3.7**	<0.40	<0.25	**1.1**	**0.55**	<0.25	**11**	<0.40
DG-AD17	6	DG-AD17W	1/25/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	**20 U**	<0.25	<0.40	**0.34 J**	<0.25	<0.25	<0.25	**0.88 J**	<0.40
DG-AG15	6	DG-AG15W	1/24/2019	<0.25 R	<0.50 R	<0.25 R	<0.25 R	<0.40 R	<0.25 R	<0.25 R	<0.25 R	<0.25 R	<10 R	**4.6 J**	<0.40 R	<0.25 R	<0.25 R	**0.87 J**	<0.25 R	**0.69 J**	**1.1 J**
DG-AI15	6	DG-AI15W	1/25/2019	<0.25	<0.50	<0.25	<0.25	<0.40	**1.7**	<0.25	**0.44 J**	<0.25	**24 U**	**14**	<0.40	<0.25	**7.3**	**0.58**	**11**	**8.3**	<0.40
DG-AK15	6	DG-AK15W	1/24/2019	<0.25 R	<0.50 R	<0.25 R	<0.25 R	<0.40 R	**0.74 J**	<0.25 R	<0.25 R	<0.25 R	**20 U**	**4.6 J**	<0.40 R	<0.25 R	**0.74 J**	<0.25 R	<0.25 R	**45 J**	<0.40 R
DG-AM15	6	DG-AM15W	1/24/2019	<0.25	**1.1 J**	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	**4.5**	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40
DG-AS11	6	DG-AS11W	1/31/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40
DG-AW11	6	DG-AW11W	1/24/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40
DG-AW11 (D)	6	DG-AW11 (D)W	1/24/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40
DG-N1	6	DG-N1W	12/18/2018	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40
MW-13A	6	MW-13AW	12/18/2018	<0.20	<0.091	<0.11	<0.20	<0.21	<0.20	<0.21	<0.17	<0.20	<20	<0.25	<0.17	<0.076	<0.13	**1**	<0.11	<0.22	<0.30

Table 9: Volatile Organic Compounds and Total Petroleum Hydrocarbon Concentrations as Gasoline in Fill
Brisbane Baylands OU-2
Brisbane, California

Sample Location	Investigation Zone	Sample Name	Collection Date	n-Propylbenzene	sec-Butylbenzene	Styrene	Tetrachloroethene (PCE)	Toluene	trans-1,2-Dichloroethene	Trichloroethene (TCE)	Vinyl Chloride	Xylenes, Total	TPH-Gasoline (C4-C12)
Aquatic Habitat Goal Levels Saltwater Ecotox ESL [1]				--	--	--	2.3E+02	2.5E+03	2.2E+04	2.0E+02	-	1.0E+02	3.7E+03
Site Specific Screening Level [2]				--	--	--	2.3E+04	2.5E+05	2.2E+06	2.0E+04	--	1.0E+04	3.7E+05
Vapor Intrusion Human Health Risk Residential ESL [3]				--	--	8.5E+03	6.4E-01	1.2E+03	2.2E+02	1.2E+00	8.6E-03	3.9E+02	--
Units				µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
DG-AA3	1	DG-AA3W	12/18/2018	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35
DG-AA7	1	DG-AA7W	1/11/2019	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35
DG-AB5	1	DG-AB5W	1/31/2019	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35
DG-AB5 (D)	1	DG-AB5 (D)W	1/31/2019	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35
DG-AC3	1	DG-AC3W	12/19/2018	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35
DG-AC7	1	DG-AC7W	1/11/2019	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35
DG-AC7 (D)	1	DG-AC7 (D)W	1/11/2019	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35
DG-AD5	1	DG-AD5W	1/7/2019	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35
DG-AD9	1	DG-AD9W	1/11/2019	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35
DG-AE3	1	DG-AE3W	12/19/2018	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35
DG-AE7	1	DG-AE7W	1/11/2019	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35
DG-AF5	1	DG-AF5W	1/7/2019	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35
DG-AG3	1	DG-AG3W	12/19/2018	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35
DG-AG7	1	DG-AG7W	1/31/2019	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35
DG-N5	1	DG-N5W	1/10/2019	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35
DG-O3	1	DG-O3W	12/18/2018	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35
DG-P5	1	DG-P5W	1/10/2019	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	**50 U**
DG-Q7	1	DG-Q7W	1/10/2019	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35
DG-Q7 (D)	1	DG-Q7 (D)W	1/10/2019	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	**50 U**
DG-R1	1	DG-R1W	12/17/2018	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35
DG-R5	1	DG-R5W	1/30/2019	<0.25	<0.25	<0.25	<0.25	**0.35 J**	<0.25	<0.25	<0.25	<0.50	<35
DG-S3	1	DG-S3W	12/18/2018	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35
DG-S7	1	DG-S7W	1/10/2019	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35
DG-T1	1	DG-T1W	12/17/2018	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35
DG-T5	1	DG-T5W	1/7/2019	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	**790**
DG-U3	1	DG-U3W	12/18/2018	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	**0.77**	<0.25	<0.50	<35
DG-U3 (D)	1	DG-U3 (D)W	12/18/2018	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	**0.71**	<0.25	<0.50	<35
DG-U7	1	DG-U7W	1/10/2019	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	**50 U**
DG-V1	1	DG-V1W	12/17/2018	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35
DG-V5	1	DG-V5W	1/7/2019	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35
DG-V9	1	DG-V9W	1/14/2019	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35
DG-W3	1	DG-W3W	12/18/2018	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35
DG-W7	1	DG-W7W	1/30/2019	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35

Table 9: Volatile Organic Compounds and Total Petroleum Hydrocarbon Concentrations as Gasoline in Fill
Brisbane Baylands OU-2
Brisbane, California

Sample Location	Investigation Zone	Sample Name	Collection Date	n-Propylbenzene	sec-Butylbenzene	Styrene	Tetrachloroethene (PCE)	Toluene	trans-1,2-Dichloroethene	Trichloroethene (TCE)	Vinyl Chloride	Xylenes, Total	TPH-Gasoline (C4-C12)
Aquatic Habitat Goal Levels Saltwater Ecotox ESL [1]				--	--	--	2.3E+02	2.5E+03	2.2E+04	2.0E+02	-	1.0E+02	3.7E+03
Site Specific Screening Level [2]				--	--	--	2.3E+04	2.5E+05	2.2E+06	2.0E+04	--	1.0E+04	3.7E+05
Vapor Intrusion Human Health Risk Residential ESL [3]				--	--	8.5E+03	6.4E-01	1.2E+03	2.2E+02	1.2E+00	8.6E-03	3.9E+02	--
Units				µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
DG-X1	1	DG-X1W	12/17/2018	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35
DG-X5	1	DG-X5W	1/7/2019	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35
DG-X9	1	DG-X9W	1/14/2019	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35
DG-Y3	1	DG-Y3W	12/18/2018	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35
DG-Y7	1	DG-Y7W	1/11/2019	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35
DG-Z5	1	DG-Z5W	1/7/2019	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35
DG-Z9	1	DG-Z9W	1/15/2019	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35
KMW-4A	1	KMW-4AW	12/18/2018	<0.20	<0.17	<0.22	<0.20	<0.17	<0.13	<0.20	<0.20	<0.40	<21
MW-11AR	1	MW-11ARW	12/18/2018	<0.20	<0.17	<0.22	<0.20	<0.17	<0.13	<0.20	<0.20	<0.40	<21
DG-AH5	2	DG-AH5W	1/7/2019	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35
DG-AI3	2	DG-AI3W	12/19/2018	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35
DG-AI3 (D)	2	DG-AI3 (D)W	12/19/2018	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35
DG-AI7	2	DG-AI7W	1/11/2019	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35
DG-AJ5	2	DG-AJ5W	1/7/2019	<0.25 R	<0.25 R	<0.25 R	<0.25 R	<0.25 R	<0.25 R	<0.25 R	<0.25 R	<0.50 R	<35 UJ
DG-AK3	2	DG-AK3W	12/19/2018	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35
DG-AK7	2	DG-AK7W	1/11/2019	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35
DG-AK7 (D)	2	DG-AK7 (D)W	1/11/2019	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35
DG-AL5	2	DG-AL5W	1/31/2019	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35
DG-AL9	2	DG-AL9W	1/22/2019	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35
DG-AM3	2	DG-AM3W	12/19/2018	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35
DG-AM7	2	DG-AM7W	1/11/2019	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35
DG-AN5	2	DG-AN5W	12/20/2018	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35
DG-AN9	2	DG-AN9W	1/21/2019	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35
DG-AO3	2	DG-AO3W	12/19/2018	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35
DG-AO7	2	DG-AO7W	1/11/2019	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35
DG-AP5	2	DG-AP5W	12/20/2018	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35
DG-AP9	2	DG-AP9W	1/21/2019	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35
DG-AQ3	2	DG-AQ3W	12/19/2018	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35
DG-AQ7	2	DG-AQ7W	1/31/2019	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35
DG-AR5	2	DG-AR5W	12/20/2018	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35
DG-AR9	2	DG-AR9W	1/11/2019	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35
DG-AR9 (D)	2	DG-AR9 (D)W	1/11/2019	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35
DG-AS3	2	DG-AS3W	12/20/2018	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35

Table 9: Volatile Organic Compounds and Total Petroleum Hydrocarbon Concentrations as Gasoline in Fill
Brisbane Baylands OU-2
Brisbane, California

Sample Location	Investigation Zone	Sample Name	Collection Date	n-Propylbenzene	sec-Butylbenzene	Styrene	Tetrachloroethene (PCE)	Toluene	trans-1,2-Dichloroethene	Trichloroethene (TCE)	Vinyl Chloride	Xylenes, Total	TPH-Gasoline (C4-C12)
Aquatic Habitat Goal Levels Saltwater Ecotox ESL [1]				--	--	--	2.3E+02	2.5E+03	2.2E+04	2.0E+02	-	1.0E+02	3.7E+03
Site Specific Screening Level [2]				--	--	--	2.3E+04	2.5E+05	2.2E+06	2.0E+04	--	1.0E+04	3.7E+05
Vapor Intrusion Human Health Risk Residential ESL [3]				--	--	8.5E+03	6.4E-01	1.2E+03	2.2E+02	1.2E+00	8.6E-03	3.9E+02	--
Units				µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
DG-AS3 (D)	2	DG-AS3 (D)W	12/20/2018	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35
DG-AS7	2	DG-AS7W	1/11/2019	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35
DG-AT5	2	DG-AT5W	12/20/2018	<0.25 R	<0.25 R	<0.25 R	<0.25 R	<0.25 R	<0.25 R	<0.25 R	<0.25 R	<0.50 R	<35 R
DG-AU3	2	DG-AU3W	12/20/2018	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35
DG-AU7	2	DG-AU7W	1/11/2019	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35
DG-AU7 (D)	2	DG-AU7 (D)W	1/11/2019	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35
DG-AV5	2	DG-AV5W	12/20/2018	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35
DG-AW3	2	DG-AW3W	1/31/2019	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35
DG-AY3	2	DG-AY3W	2/1/2019	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35
KMW-7A	2	KMW-7AW	12/19/2018	<0.20	<0.17	<0.22	<0.20	<0.17	<0.13	<0.20	<0.20	<0.40	<21
LF-5A	2	LF-5AW	12/19/2018	<0.20	<0.17	<0.22	<0.20	<0.17	<0.13	<0.20	<0.20	<0.40	<21
MW-10A	2	MW-10AW	12/19/2018	<0.20	<0.17	<0.22	<0.20	<0.17	<0.13	<0.20	<0.20	<0.40	<21
DG-N13	3	DG-N13W	1/11/2019	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35
DG-N13 (D)	3	DG-N13 (D)W	1/11/2019	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35
DG-N9	3	DG-N9W	1/14/2019	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35
DG-O11	3	DG-O11W	1/14/2019	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35
DG-O15	3	DG-O15W	1/11/2019	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35
DG-O7	3	DG-O7W	1/10/2019	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	**50 U**
DG-P13	3	DG-P13W	1/11/2019	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35
DG-Q11	3	DG-Q11W	1/15/2019	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35
DG-Q11 (D)	3	DG-Q11 (D)W	1/15/2019	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35
DG-Q15	3	DG-Q15W	1/11/2019	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	**35 J**
DG-R13	3	DG-R13W	1/29/2019	<0.25	<0.25	<0.25	<0.25	**0.34 J**	<0.25	**0.92**	<0.25	<0.50	<35
DG-R9	3	DG-R9W	1/25/2019	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35
DG-S11	3	DG-S11W	1/15/2019	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35
DG-S15	3	DG-S15W	1/11/2019	<0.25	<0.25	<0.25	**0.72**	<0.25	<0.25	**0.55**	<0.25	<0.50	<35 UJ
DG-S15 (D)	3	DG-S15 (D)W	1/11/2019	<0.25	<0.25	<0.25	**0.66**	<0.25	<0.25	**0.56**	<0.25	<0.50	**37 J**
DG-T13	3	DG-T13W	1/15/2019	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35
DG-T17	3	DG-T17W	1/31/2019	<0.25	<0.25	<0.25	<0.25	**0.62**	<0.25	<0.25	<0.25	<0.50	<35
DG-T9	3	DG-T9W	1/14/2019	<0.25 R	<0.25 R	<0.25 R	<0.25 R	<0.25 R	<0.25 R	<0.25 R	<0.25 R	<0.50 R	<35 R
DG-U11	3	DG-U11W	1/15/2019	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35
DG-U15	3	DG-U15W	1/28/2019	<0.25	<0.25	<0.25	<0.25	**0.78**	<0.25	<0.25	<0.25	<0.50	**36 J**
DG-V13	3	DG-V13W	1/15/2019	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35

Table 9: Volatile Organic Compounds and Total Petroleum Hydrocarbon Concentrations as Gasoline in Fill
Brisbane Baylands OU-2
Brisbane, California

Sample Location	Investigation Zone	Sample Name	Collection Date	n-Propylbenzene	sec-Butylbenzene	Styrene	Tetrachloroethene (PCE)	Toluene	trans-1,2-Dichloroethene	Trichloroethene (TCE)	Vinyl Chloride	Xylenes, Total	TPH-Gasoline (C4-C12)
Aquatic Habitat Goal Levels Saltwater Ecotox ESL [1]				--	--	--	2.3E+02	2.5E+03	2.2E+04	2.0E+02	-	1.0E+02	3.7E+03
Site Specific Screening Level [2]				--	--	--	2.3E+04	2.5E+05	2.2E+06	2.0E+04	--	1.0E+04	3.7E+05
Vapor Intrusion Human Health Risk Residential ESL [3]				--	--	8.5E+03	6.4E-01	1.2E+03	2.2E+02	1.2E+00	8.6E-03	3.9E+02	--
Units				µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
DG-V17	3	DG-V17W	1/28/2019	<0.25	<0.25	<0.25	<0.25	**0.46 J**	<0.25	<0.25	<0.25	<0.50	<35
LF-3A	3	LF-3AW	12/18/2018	<0.20	<0.17	<0.22	<0.20	<0.17	<0.13	<0.20	<0.20	<0.40	<21
LF-3A (D)	3	LF-3A (D)W	12/18/2018	<0.20	<0.17	<0.22	<0.20	<0.17	<0.13	<0.20	<0.20	<0.40	<21
MW-9A	3	MW-9AW	12/18/2018	<0.20	<0.17	<0.22	<0.20	<0.17	<0.13	<0.20	<0.20	<0.40	<21
DG-AA11	4	DG-AA11W	1/30/2019	**0.25 J**	**0.68**	<0.25	<0.25	<0.25	<0.25	<0.25	**0.44 J**	<0.50	**2,300**
DG-AA15	4	DG-AA15W	1/25/2019	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	**0.34 J**	**1.3**	<0.50	<35
DG-AA19	4	DG-AA19W	1/25/2019	<0.25 UJ	<0.25 UJ	<0.25 UJ	<0.25 UJ	<0.25 UJ	<0.25 UJ	<0.25 UJ	<0.25 UJ	<0.50 UJ	**1,600 J**
DG-AB13	4	DG-AB13W	1/25/2019	<0.25 UJ	<0.25 UJ	<0.25 UJ	<0.25 UJ	<0.25 UJ	<0.25 UJ	<0.25 UJ	<0.25 UJ	<0.50 UJ	<35
DG-AB13 (D)	4	DG-AB13 (D)W	1/25/2019	<0.25 UJ	<0.25 UJ	<0.25 UJ	<0.25 UJ	<0.25 UJ	<0.25 UJ	<0.25 UJ	<0.25 UJ	<0.50 UJ	<35
DG-AD13	4	DG-AD13W	2/1/2019	**0.78 J**	<0.25	**0.36 J**	<0.25	**15 J**	<0.25	<0.25	<0.25	**14**	**290 J**
DG-AD13 (D)	4	DG-AD13 (D)W	2/1/2019	**0.47 J**	<0.25	<0.25 UJ	<0.25	**11 J**	<0.25	<0.25	<0.25	**11**	**190 J**
DG-AE11	4	DG-AE11W	1/22/2019	**1.2**	**0.28 J**	<0.25	<0.25	**0.35 J**	<0.25	<0.25	<0.25	**0.59 J**	**190 J+**
DG-AG11	4	DG-AG11W	1/22/2019	**1.3**	**0.49 J**	<0.25	<0.25	**0.39 J**	<0.25	<0.25	<0.25	**0.69 J**	**390**
DG-AH13	4	DG-AH13W	1/29/2019	**1.7**	**0.5**	<0.25	<0.25	**0.72**	<0.25	<0.25	<0.25	**1.1**	**100**
DG-AJ13	4	DG-AJ13W	1/29/2019	<0.25	<0.25	<0.25	<0.25	**0.29 J**	<0.25	<0.25	<0.25	<0.50	<35
DG-AK11	4	DG-AK11W	1/29/2019	**0.35 J**	<0.25	<0.25	<0.25	**0.53**	<0.25	<0.25	<0.25	**1.5**	**87**
DG-AL13	4	DG-AL13W	1/29/2019	<0.25	<0.25	<0.25	<0.25	**0.31 J**	<0.25	<0.25	<0.25	<0.50	<35
DG-AN13	4	DG-AN13W	2/1/2019	<0.25	<0.25	<0.25	<0.25	**0.37 J**	<0.25	<0.25	<0.25	<0.50	<35
DG-W11	4	DG-W11W	1/30/2019	<0.25 R	<0.25 R	<0.25 R	<0.25 R	<0.25 R	<0.25 R	<0.25 R	<0.25 R	<0.50 R	<35 R
DG-W15	4	DG-W15W	1/29/2019	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35
DG-X13	4	DG-X13W	1/25/2019	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35
DG-X17	4	DG-X17W	1/28/2019	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	**67**
DG-Y11	4	DG-Y11W	1/22/2019	<0.25	**0.49 J**	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	**1,200**
DG-Y15	4	DG-Y15W	2/1/2019	<0.25	<0.25	<0.25	**0.97**	<0.25	**0.6**	**6.1**	**9.7**	<0.50	**290**
DG-Y19	4	DG-Y19W	1/28/2019	<0.25	<0.25	<0.25	<0.25	**0.26 J**	<0.25	<0.25	<0.25	<0.50	<35
DG-Z17	4	DG-Z17W	1/28/2019	<0.25	<0.25	<0.25	<0.25	**0.32 J**	<0.25	<0.25	<0.25	<0.50	**95**
LF-4A	4	LF-4AW	12/18/2018	<0.20	<0.17	<0.22	<0.20	<0.17	<0.13	<0.20	<0.20	<0.40	<21
LF-8A	4	LF-8AW	12/19/2018	<0.20	<0.17	<0.22	<0.20	<0.17	<0.13	<0.20	<0.20	<0.40	<21
MW-15A	4	MW-15AW	12/18/2018	<0.20	<0.17	<0.22	<0.20	<0.17	<0.13	<0.20	<0.20	<0.40	<21
MW-17A	4	MW-17AW	12/18/2018	<0.20	<0.17	<0.22	<0.20	<0.17	<0.13	<0.20	<0.20	<0.40	<21
MW-17A (D)	4	MW-17A (D)W	12/18/2018	<0.20	<0.17	<0.22	<0.20	<0.17	<0.13	<0.20	<0.20	<0.40	<21
DG-AO11	5	DG-AO11W	1/31/2019	<0.25	<0.25	<0.25	<0.25	**0.88**	<0.25	<0.25	<0.25	**0.57 J**	<35
DG-AQ11	5	DG-AQ11W	1/31/2019	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35

Table 9: Volatile Organic Compounds and Total Petroleum Hydrocarbon Concentrations as Gasoline in Fill
Brisbane Baylands OU-2
Brisbane, California

Sample Location	Investigation Zone	Sample Name	Collection Date	n-Propylbenzene	sec-Butylbenzene	Styrene	Tetrachloroethene (PCE)	Toluene	trans-1,2-Dichloroethene	Trichloroethene (TCE)	Vinyl Chloride	Xylenes, Total	TPH-Gasoline (C4-C12)
Aquatic Habitat Goal Levels Saltwater Ecotox ESL [1]				--	--	--	2.3E+02	2.5E+03	2.2E+04	2.0E+02	-	1.0E+02	3.7E+03
Site Specific Screening Level [2]				--	--	--	2.3E+04	2.5E+05	2.2E+06	2.0E+04	--	1.0E+04	3.7E+05
Vapor Intrusion Human Health Risk Residential ESL [3]				--	--	8.5E+03	6.4E-01	1.2E+03	2.2E+02	1.2E+00	8.6E-03	3.9E+02	--
Units				µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
DG-AT9	5	DG-AT9W	1/31/2019	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35
DG-AV9	5	DG-AV9W	2/1/2019	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35
DG-AX5	5	DG-AX5W	12/20/2018	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35
LF-7A	5	LF-7AW	12/19/2018	<0.20	<0.17	<0.22	<0.20	<0.17	<0.13	<0.20	<0.20	<0.40	<21
MK-7A	5	MK-7AW	12/19/2018	<0.20	<0.17	<0.22	<0.20	<0.17	<0.13	<0.20	<0.20	<0.40	<21
MK-8A	5	MK-8AW	12/19/2018	<0.20	<0.17	<0.22	**0.98**	<0.17	<0.13	<0.20	<0.20	<0.40	<21
DG-AB17	6	DG-AB17W	1/25/2019	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	**700**
DG-AC15	6	DG-AC15W	2/1/2019	**0.48 J**	<0.25	<0.25	<0.25	**1.2**	<0.25	<0.25	<0.25	**7.7**	**120**
DG-AD17	6	DG-AD17W	1/25/2019	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35
DG-AG15	6	DG-AG15W	1/24/2019	**1.7 J**	<0.25 R	<0.25 R	<0.25 R	<0.25 R	<0.25 R	<0.25 R	<0.25 R	<0.50 R	**160 J**
DG-AI15	6	DG-AI15W	1/25/2019	**1.6**	<0.25	<0.25	<0.25	**3.4**	<0.25	<0.25	<0.25	**16**	**260**
DG-AK15	6	DG-AK15W	1/24/2019	**0.41 J**	<0.25 R	<0.25 R	<0.25 R	**0.93 J**	<0.25 R	<0.25 R	<0.25 R	**2.4 J**	**170 J**
DG-AM15	6	DG-AM15W	1/24/2019	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	**150**
DG-AS11	6	DG-AS11W	1/31/2019	<0.25	<0.25	<0.25	<0.25	**0.26 J**	<0.25	<0.25	<0.25	<0.50	<35
DG-AW11	6	DG-AW11W	1/24/2019	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	**79 J**
DG-AW11 (D)	6	DG-AW11 (D)W	1/24/2019	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35 UJ
DG-N1	6	DG-N1W	12/18/2018	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35
MW-13A	6	MW-13AW	12/18/2018	<0.20	<0.17	<0.22	<0.20	<0.17	<0.13	<0.20	<0.20	<0.40	<21

Table 9: Volatile Organic Compounds and Total Petroleum Hydrocarbon Concentrations as Gasoline in Fill

Brisbane Baylands OU-2

Brisbane, California

Notes:

1. San Francisco Bay RWQCB, 2019. Summary of Groundwater ESLs, Jan. 2019 (Rev. 1) - Aquatic Habitat Goal Levels (Table GW-2): Saltwater Ecotoxicity.
2. Site specific screening level is the saltwater ecotoxicity ESL with a 100-fold attenuation factor.
3. San Francisco Bay RWQCB, 2019. Summary of Groundwater ESLs, Jan. 2019 (Rev. 1) - Groundwater Vapor Intrusion Human Health Risk Levels (Table GW-3): Residential.

- The lower of the site specific ecotoxicity screening level and the vapor intrusion screening level was used as comparison criteria.
- VOCs and TPH-gasoline were analyzed by USEPA Method 8260B.
- TPH-diesel and motor oil were analyzed by USEPA Method 8015B.
- Only analytes with detections are included in this table.
- Non-detect results are presented with "<" followed by the MDL.
- Results in bold font indicate a detection above the MDL.
- Gray shading indicates a detection above the comparison criteria.

Abbreviations and Symbols:

"J" - Analyte was detected but the associated numerical value is the approximate concentration.
"J+" - Analyte was detected but the associated numerical value is likely to be higher than the concentration of the analyte in the sample due to positive bias of associated QC or calibration data or attributable to matrix interference.
"J-" - Analyte was detected but the associated numerical value is likely to be lower than the concentration of the analyte in the sample due to negative bias of associated QC or calibration data or attributable to matrix interference.
"R" - The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.
"U" - Not detected at or above the reported result.
"UJ" - The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
"--" - Not Available
"<" - Non-detect result
(D) - Duplicate sample
µg/L - microgram per liter
ESL - Environmental Screening Level
MDL - Method Detection Limit
QC - quality control
RWQCB - Regional Water Quality Control Board
TPH - Total petroleum hydrocarbons
USEPA - United States Environmental Protection Agency
VOCs - volatile organic compounds

Table 10: Potentially Applicable or Relevant and Appropriate Requirements (ARARs)

Brisbane Baylands OU-2
Brisbane, California

ARAR Type	Standard, Requirement, or Criterion	Citation	Description
Federal ARARs			
Chemical	Clean Air Act (CAA)	42 USC 7401-7642	Emission standards for stationary and mobile sources.
Chemical	Hazardous Waste Identification	40 CFR 261.24	Establishes criteria to determine whether solid waste exhibits hazard characteristics.
Chemical	Toxic Substances Control Act (TSCA)	40 CFR 761	TSCA regulates the use, cleanup, and disposal of various chemicals, including PCBs. Subpart D of 40 CFR Part 761 outlines disposal and cleanup procedures for "PCB remediation waste," which includes PCB-contaminated soil from a spill or release of PCBs. PCB remediation waste does not include materials disposed of prior to 1978 that currently have a PCB concentration greater than 50 parts per million. Under 40 CFR, Part 761.61(a)(4), TSCA includes a sliding scale for cleanup of PCB-impacted soil based on high- and low-occupancy future site uses is established. High-Occupancy Areas: The cleanup level (CUL) for bulk PCB remediation material / soil in high-occupancy areas is less than or equal to 1 mg/kg without further conditions. High-occupancy areas where bulk PCB remediation material/soil remains at concentrations greater than 1 mg/kg and less than or equal to 10 mg/kg shall be covered with a cap. Low-Occupancy Areas: 1) the CUL for bulk PCB remediation material/soil in low-occupancy areas is less than or equal to 25 mg/kg; 2) bulk PCB remediation material/soil may remain at a cleanup site at concentrations greater than 25 mg/kg and less than or equal to 50 mg/kg if the site is secured by a fence and marked with a sign; 3) bulk PCB remediation material/soil may

Table 10: Potentially Applicable or Relevant and Appropriate Requirements (ARARs)
Brisbane Baylands OU-2
Brisbane, California

ARAR Type	Standard, Requirement, or Criterion	Citation	Description
			remain at a cleanup site at concentrations greater than 25 mg/kg and less than or equal to 100 mg/kg if the site is covered with a cap. Under 40 CFR Part 761.61(c), alternative soil CULs can be proposed to EPA based on an evaluation of risks associated with PCBs remaining on site. The PCB concentrations in soil exceeding 1 mg/kg are not correlated with post-1978 activities at the Site. Thus, TSCA's PCB remediation waste cleanup requirements may not be applicable to the PCBs discovered at the Site, but may be relevant and appropriate for management and/or disposal of PCB-contaminated soil.
Chemical/ Action	Classification and Regulation of Hazardous Waste	40 CFR 260	Establishes criteria for the determination of hazardous waste and its regulation.
Action	National Pollutant Discharge Elimination System (NPDES)	40 CFR Parts 122-124	Establishes requirements to ensure storm-water discharges do not contribute to a violation of surface-water quality standards.
Action	NPDES	40 CFR Part 403 (33-USC 1251-1376)	Establishes national pretreatment standards to control pollutants that pass through or interfere with treatment processes in public owned treatment works or that may contaminate sewage sludge.
Action	Comprehensive, Environmental Response, Compensation and Recovery Act and Superfund Amendments and Reauthorization Act of 1986, and National Oil and Hazardous Substances Pollution Contingency Plan	40 CFR 300	Establishes policies and procedures for investigation and remediation decisions for protection of public health and the environment.
Chemical/ Action	Clean Water Act (CWA)	33 USC 1251	Establishes regulatory and nonregulatory tools to sharply reduce direct pollutant discharges into waterways, finance municipal wastewater treatment facilities, and manage polluted runoff.
Action	Drinking Water Standards	40 CFR Part 141	Establishes maximum contaminant levels (MCLs) to protect water quality in public drinking water systems.

Table 10: Potentially Applicable or Relevant and Appropriate Requirements (ARARs)
Brisbane Baylands OU-2
Brisbane, California

ARAR Type	Standard, Requirement, or Criterion	Citation	Description
Action	Occupational Health and Safety	29 CFR 1910, 120	Establishes requirements for health and safety training.
TBC	Health Risk Assessment (HRA)	US EPA, Risk Assessment Guidance for Superfund (1989)	Guidance and framework to assess health risk.
State and Local ARARs			
Chemical	Ambient Air Quality Standards	HSC 39000-44071	Establishes standards for emissions of chemical vapors and dust.
Chemical	Determination of Characteristic Wastes	22 CCR 66261.24	Establishes criteria for identifying characteristic wastes.
Location	Remedial Requirements for Residential Development	Brisbane Measure JJ	Requires that all residential development be designed and remediated to accommodate ground-level residential uses and ground-level residential supportive uses (e.g., parks, schools, etc.)
Action	Emission Standard	BAAQMD Regulation 6	Establishes emission standards for particulates.
Action	Emission Standard	BAAQMD Regulations 2 and 8	Establish emission and permitting standards for volatile organic compounds (VOCs).
Action	Hazardous Waste Control	HAC 25100-25250.26	Establishes hazardous waste control measures.
Action	Hazardous Waste Generator Requirements	22 CCR 66262.11 et seq.	Establishes standards applicable to generators of hazardous waste.
Action	Discharge to POTW	City/County Wastewater Discharge Requirements	Establishes pretreatment standards to control pollutants.
Action	State Superfund Act	HSC 25300 et. seq.	Establishes policies and procedures for investigation and remediation decisions for protection of public health and the environment.
Action	SFBRWQCB Site Mitigation Program Policies and Procedures	SFBRWQCB	Applicable policies, procedures, management memos, and related guidance documents.
Action	Drinking Water Standards	22 CCR 64431 and 64444	Establishes maximum contaminant levels to protect water quality in public drinking water systems.
Action	Porter-Cologne Water Quality Control Act	SWRCB	Establishes policies and procedures for investigation and remediation decisions for preservation and protection of waters of the state for beneficial uses.

Table 10: Potentially Applicable or Relevant and Appropriate Requirements (ARARs)
Brisbane Baylands OU-2
Brisbane, California

ARAR Type	Standard, Requirement, or Criterion	Citation	Description
Action	Water Quality Control Plan (Basin Plan) for the San Francisco Bay Basin	SFBRWQCB	Establishes water quality objectives for the San Francisco Bay.
Action	California Occupational Health and Safety	8 CCR 1500, 2300, and 3200 et seq.	Establishes standards for working conditions and employees matter; and notification requirements.
Action	Environmental Impact Review (EIR)	PRC 21000-2177	Mandates environmental impact review of project approved by governmental agencies
Action	Land Use Covenants (LUC)	22 CCR 67391.1	Specify that a LUC imposing appropriate limitations on land use shall be executed and recorded when hazardous materials, hazardous wastes or constituents, or hazardous substances will remain at the property at levels, which are not suitable for unrestricted use of the land.
TBC	Health Risk Assessment (HRA)	DTSC (Human Health Risk Assessment (HHRA) Note 3 – DTSC-Modified Screening Levels)	Guidance and framework to assess health risk.
TBC	Health Risk Assessment (HRA)	SFBRWQCB (Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater)	Guidance and framework to assess health risk

Table 10: Potentially Applicable or Relevant and Appropriate Requirements (ARARs)

Brisbane Baylands OU-2
Brisbane, California

Abbreviations:

ARARs	Applicable or Relevant and Appropriate Requirements	PCBs	polychlorinated biphenyls
BAAQMD	Bay Area Air Quality Management District	POTW	Publicly Owned Treatment Works
CAA	Clean Air Act	PRC	California Public Resources Code
CCR	California Code of Regulations	RCRA	Resource Conservation and Recovery Act
CUL	cleanup level	SFBRWQCB	San Francisco Bay Regional Water Quality Control Board
CWA	Clean Water Act	SWRCB	State Water Resources Control Board
EIR	Environmental Impact Review/Report	TBC	To Be Considered
HHRA	Human Health Risk Assessment	TSCA	Toxic Substances Control Act
HRA	Health Risk Assessment	USC	United States Code
HSC	California Health and Safety Code	VOCs	volatile organic compounds
LUCs	Land Use Covenants		
MCLs	Maximum Contaminant Levels		
NPDES	National Pollutant Discharge Elimination System		

Table 11: Remedial Technology Screening Matrix
Brisbane Baylands OU-2
Brisbane, California

Environmental Media	Remedial Technology	Description	Effectiveness	Implementability	Relative Cost	Recommended for Alternative Development
All Media	No Action	No institutional controls, engineering controls, actions, treatment, or monitoring.	Not effective for protecting human health and the environment, where potential risks are present.	Implementable, but likely not acceptable to the general public or government agencies.	None.	Not recommended.
	Institutional Controls or Engineering Controls	Implement land use restrictions to inform future owners of potentially hazardous substances at the Site and/or for the protection of human health and environment to restrict future land use of site. Institutional controls could include land use controls, such as the prohibition of the use without Water Board approval, and prohibitions on beneficial uses of groundwater where potential risks are present. Engineering controls could include vapor intrusion mitigation and Site management protocols should soil and/or groundwater with residual levels of COCs be encountered during future construction or Site development activities.	Effectiveness for protection of human health and environment would depend on enforcement of and compliance with land use covenants and specific application.	Practical to implement. Specific legal requirements and authority would need to be met.	Low capital.	Recommended.
Indoor Air	Sub-Slab Vapor Barrier/Depressurization System	Installation of synthetic membrane vapor barrier beneath the building slab to prevent migration of vapor between sub-slab and indoor air and/or installation of sub-slab depressurization system inside existing or new buildings to create a pressure gradient such that vapor flow from sub-slab into indoor air is inhibited. Both methods mitigate vapor intrusion to indoor air.	Effective for preventing migration of CVOCs into indoor air. Not effective for decreasing concentrations of CVOCs in soil vapor.	Practical to implement during building construction.	Moderate capital. Low O&M.	Recommended if warranted based on future soil vapor sampling in future buildings.
Soil and Soil Vapor	Capping	Placement of a minimum of 5 feet of clean, imported soil or hardscape over impacted areas. Includes relocation of soil where appropriate.	Effective for preventing exposure to soil containing COCs. Not effective for preventing vapor intrusion of CVOCs.	Practical to implement.	Moderate capital. Low O&M	Recommended.
	Soil Vapor Extraction (SVE)	Installation of extraction wells in the vadose zone and SVE system infrastructure, including conveyance piping and treatment system. Vacuum is applied through extraction pipes to create a pressure gradient in impacted areas, which induces gas-phase volatiles to diffuse through soil to extraction wells. The gas-phase volatiles would likely be treated via granular activated carbon (GAC) filtration with the treated vapor discharged to the atmosphere under a Bay Area Air Quality Management District (BAAQMD) permit. Performance monitoring would also be conducted to assess SVE radius of influence and progress toward remedial goals.	Effective for CVOCs in coarser-grained soils, but due to shallow depth to groundwater, short-circuiting will greatly impact its effectiveness. Not effective for metals, PCBs, or PAHs.	Impractical to implement due to shallow groundwater table and fine-grained soils.	Moderate capital. Moderate O&M.	Not recommended.
	Excavation	Excavation of soil in areas where high concentrations of COCs are present in vadose zone soil. The excavated material will be profiled and either relocated to proposed roadway areas or disposed of at an appropriate waste disposal facility.	Effective for complete range of COCs.	Practical to implement in localized areas to address COCs at levels greater than CULs.	Very high capital. Negligible O&M.	Recommended in limited application only.
	Thermal Destruction	Installation of thermal treatment system (heating wells, vapor extraction wells, aboveground treatment) to address CVOCs , PAHs, and PCBs in vadose zone. Performance of the system would be monitored during operation to confirm treatment and following operation to evaluate remedy performance.	Can effectively reduce CVOC, PAH, and PCB concentrations in high and low permeability units. Not effective for metals.	Impractical to implement over a large area and relatively low concentrations.	Very high capital. High O&M.	Not recommended.
	In Situ Smoldering Technology	STAR is an innovative in situ thermal technology based on the principles of smoldering combustion, where the contaminants are the source of fuel. The process is sustained by the addition of air through a well to the target treatment zone and is initiated through a short duration, low energy "ignition event." Once the process is initiated (ignited), the energy of the reacting contaminants is used to pre-heat and initiate combustion of contaminants in adjacent areas, propagating a combustion front through the contaminated zone in a self-sustaining manner (i.e., no external energy or added fuel input following ignition) provided a sufficient flux of oxygen is supplied. Active control of the combustion front is maintained by the oxygen supply. The above ground equipment used to implement the technology is similar to that used in Air Sparge/Soil Vapor Extraction systems and includes compressors for sub-surface air delivery, blowers for ground surface vapor collection, and vapor phase activated carbon or a thermal oxidizer for vapor treatment. The specialized equipment associated with the STAR process includes the use of 2-inch diameter, carbon steel direct push ignition wells with a stainless steel screen, temporary in-well heaters to initiate the process, and subsurface multi-level thermocouple bundles to track the combustion process.	Can effectively treat CVOC, PAH, Bunker C, and PCB contamination in soils. Not effective for metals. In situ methods may not be as effective due to shallow depth to groundwater.	Impractical to implement over a large area, and may be difficult to implement due to shallow groundwater.	Moderate-high capital, Negligible O&M	Not recommended.
	Ex Situ Smoldering Technology	Ex Situ (STARx) treatment systems use the same patented process as the in situ STAR technology: smoldering combustion. The STARx process also uses a lot of the same equipment as the STAR technology (compressors, blowers, vapor treatment), but is carried out in engineered soil piles placed on hot pad systems. Hot pads are fully scalable and can be sized depending on treatment volume, available footprint, and treatment time requirements. These systems are suitable for stockpiles of contaminated soils, sites where surficial soils are contaminated, or for waste oils and sludges.	Can effectively treat CVOC, PAH, Bunker C, and PCB contamination in soils. Not effective for metals. Ex situ methods may be more effective due to shallow depth to groundwater. Effective treatment of oil sludge.	Practical to implement as onsite treatment with excavation.	Moderate-high capital, Negligible O&M	Recommended in limited application only.
	Air Sparging	Installation of wells (horizontal or vertical) for injecting air into the vadose zone where high concentrations of CVOCs are present. Includes construction of aboveground infrastructure for distributing air to the subsurface.	Potentially effective for treating CVOCs in the vadose zone, but due to shallow depth to groundwater, short-circuiting will greatly impact its effectiveness. Not effective for metals, PCBs, or PAHs.	Impractical to implement due to shallow groundwater table	Moderate-high capital. High O&M	Not recommended.
	Soil Mixing	Use of a large diameter auger or similar technology to mix soil in situ with a chemical oxidant (for CVOC destruction) and/or clay (for COC sequestration).	Could reduce mass of CVOCs and reduce the toxicity and mobility of other COCs.	Impractical to implement over a large area and relatively low concentrations.	Very high capital. Low O&M	Not recommended.
	Dual-Phase Extraction	Extraction of soil vapor and groundwater containing CVOCs using wells, coupled with ex-situ treatment of extracted vapor/groundwater and off-site disposal. Would require installation of extraction wells.	Can be effective for CVOCs in the vadose zone and groundwater. Diffusion of CVOCs from low permeability units would require very long-term operation.	Impractical to implement due to extended timeframe for cleanup and land use requirements for aboveground treatment equipment.	Moderate-high capital. High O&M.	Not recommended.

Table 11: Remedial Technology Screening Matrix
Brisbane Baylands OU-2
Brisbane, California

Environmental Media	Remedial Technology	Description	Effectiveness	Implementability	Relative Cost	Recommended for Alternative Development
Groundwater	Groundwater Monitoring	Continued monitoring of CVOCs and metals to evaluate ongoing attenuation of CVOCs in groundwater due to ERD implementation at Schlage OU and UPC OU-SF. Also to confirm that metals in soil are not causing unacceptable levels of metals in groundwater. Monitoring would likely be conducted annually in all three water-bearing zones.	Effective, as attenuation of CVOCs in groundwater has been observed to date due to ERD remedy. Monitoring would allow for continued evaluation of attenuation in all groundwater zones.	Practical to implement. Will destroy existing wells and replace monitoring wells as appropriate to continue long-term monitoring.	Low capital. Low O&M.	Recommended.
	In Situ Chemical Oxidation (ISCO)	Injection of chemical oxidant solution into CVOC-impacted zone to enhance degradation. Would require closely-spaced injections, multiple injection events over time would be required. Performance monitoring would also be conducted to assess progress and need for additional injections.	Effective for creating oxidizing conditions in the subsurface and breaking down CVOCs, dissolved phase TPH in groundwater. Demonsrated effectiveness.	Practical to implement.	Moderate to high capital. Low O&M.	Recommended
	In Situ Biological or Chemical Reduction (ISBR or ISCR)	Injection of electron donor or chemical reductant solution or media into CVOC-impacted zone to enhance reductive dechlorination. Would require closely-spaced multiple injections. Performance monitoring would also be conducted to assess progress and need for additional injections.	Effective for creating reducing conditions in the subsurface in which dechlorinating bacteria, such as *Dehalococcoides* , can be delivered to enhance reductive dechlorination of TCE and its daughter products to ethene, a non-harmful end product. Demonstrated effectiveness.	Practical to implement.	Moderate capital. Low O&M.	Recommended
	Groundwater Extraction and Treatment	Installation of extraction wells near the upgradient boundary of the Site to remove CVOCs. Includes construction of groundwater extraction and treatment system (GETS) infrastructure, including conveyance piping and treatment system onsite. Treatment of water would likely be via GAC filtration with water discharged to the sanitary sewer. Treatment of other constituents in groundwater may be required. Performance monitoring would also be conducted to assess capture and progress toward remedial goals.	Effective with regard to removing COCs from groundwater. Less effective than in situ technologies with respect to mass removal, given low production rates in the Fill Water-Bearing Zone. Rate of CVOC mass removal may be slow relative to other technologies.	Practical to implement in localized areas to address COCs at levels greater than CULs. Enhanced reductive dechlorination (ERD) is effective at continuing to remove CVOC mass.	Moderate to high capital. High O&M.	Not recommended.
	Permeable Reactive Barrier (PRB)	Construction of a reactive barrier using zero valent iron (ZVI) or a comparable material near the upgradient boundary of the Site to prevent migration of COCs onto the Site. Construction techniques could include trenching and backfill with ZVI/sand mixtures or direct injection of ZVI through closely-spaced injection points. Performance monitoring within the barrier would be conducted to assess treatment efficacy.	Effective with regard to limiting migration of COCs in groundwater. Would not reduce COC mass that has already migrated to the Site.	Impractical to implement to treat very low COC concentrations over localized area.	Moderate to high capital. Low O&M.	Not recommended.
	Phytoremediation	Installing an engineered system of trees to take up groundwater to prevent migration of COCs. Performance monitoring within the phytoremediation system would be conducted to assess treatment efficacy.	Could limit further migration of COCs in groundwater. Could reduce mass where applied.	Impractical to implement to treat very low COC concentrations over a localized area.	Low to moderate capital. Low O&M.	Not recommended.

Notes:
BAAQMD - Bay Area Air Quality Management District
CVOC - chlorinated volatile organic compounds
CULs - cleanup levels
COC - Contaminants of Concern
ERD - enhanced reductive dechlorination
GAC - granular activated carbon
GETS - groundwater extraction and treatment system
ISBR - in situ biological reduction
ISCR - in situ chemical reduction
ISCO - in situ chemical oxidation
O&M - operation and maintenance
PAHs - polynuclear aromatic hydrocarbons
PCBs - polychlorinated biphenyls
PRB - permeable reactive barrier
STARx - Ex Situ treatment system
SVE - soil vapor extraction
TCE - trichloroethene
TPH - total petroleum hydrocarbons
ZVI - zero valent iron
-The remedial technologies screened in this table were based on commonly successful remediation technologies and the use of particular technologies that have been implemented at the Site to date.

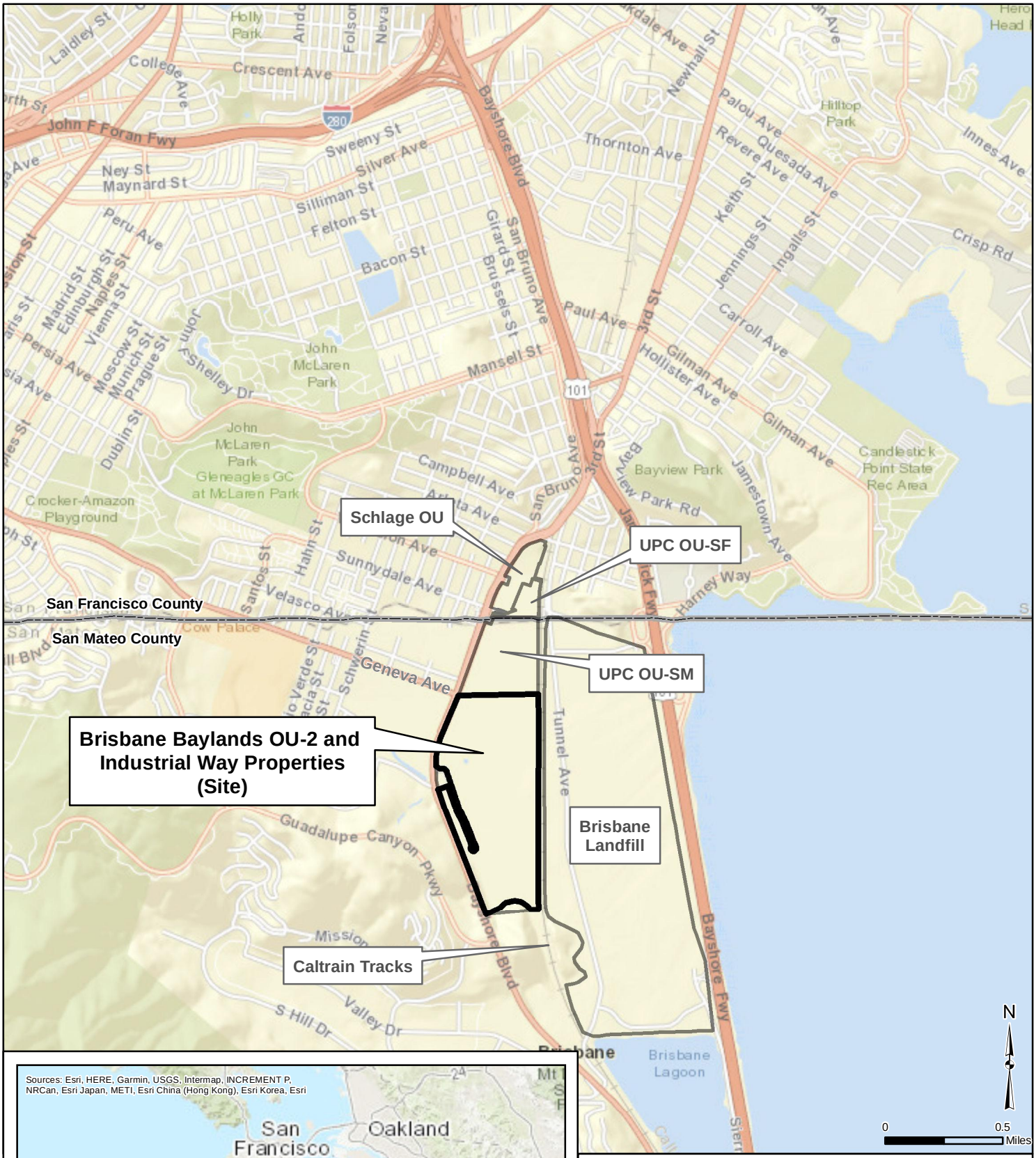
Table 12: Comparative Analysis of Remedial Alternatives
Brisbane Baylands OU-2
Brisbane, California

	Criteria	Alternative 1	Alternative 2	Alternative 3	Alternative 4
		No Action	**Land Use Restrictions / Engineering Controls / Monitored Natural Attenuation**	**Land Use Restrictions / Soil Capping / Excavation with Relocation and Containment / Excavation with Offsite Disposal / In Situ Groundwater Treatment and Monitoring**	**Excavation with Offsite Disposal / In Situ Groundwater Treatment and Monitoring / Restoring to Original Grade**
Threshold Criteria					
1	Overall Protection of Human Health and the Environment	Does not provide an adequate level of protection of human health and the environment.		Mitigates exposure to COCs sitewide.	
2	Compliance with ARARs	Does not comply with ARARs.		Complies with ARARs.	
Balancing Criteria					
3	Reduction of Toxicity, Mobility, and Volume through Treatment	Does not reduce toxicity, mobility, and volume through treatment.		Sitewide reduction in COC mobility by capping/backfilling excavations and in COC volume and toxicity by in situ groundwater treatment. Although there is reduction in onsite COC volume in soil by offsite disposal, the volume is merely transferred to an offsite landfill.	
4	Long-Term Effectiveness and Permanence	No mechanism to ensure long-term effectiveness and permanence.	Some long-term effectiveness, though not sitewide, through land use restrictions, engineering controls, and MNA.	Long-term effectiveness and permanence through land use restrictions and Site documents including a Soil Management Plan and Operations and Maintenance Plan.	
5	Short-Term Effectiveness	No sitewide short-term effectiveness.		Safe construction practices provide short-term effectiveness. Duration of possible exposure during implementation (excavation/offhaul) less than Alternative 4.	Extensive excavation and offhaul provides highest risk of exposure and greatest impacts to air quality, noise, and traffic during implementation.
6	Implementability	Readily implementable because no actions taken, but not likely acceptable to stakeholders because it does not meet threshold criteria.	Readily implementable, but not likely acceptable to stakeholders because it does not meet threshold criteria.	Readily implementable, likely acceptable to stakeholders, comparatively small environmental impact during implementation of remedy.	Readily implementable and likely acceptable to stakeholders, but greatest environmental impact during implementation of remedy due to vehicle exhaust, noise, and other factors. Greatest risk of accidents due to high traffic volumes. High local traffic volumes, exhaust, and noise will pose conflicts with local community.
7	Cost	$0	$8,100,000	$43,300,000	$201,500,000 - Cost is more than 4.6 times higher than all other alternatives and does not provide a commensurate level of protectiveness.
	Point Total	4	5	19	13
	Overall Comparative Ranking	4	3	1	2

Notes:
- Alternative meets/addresses criteria (3 points)
- Alternative mostly meets/addresses criteria (2 points)
- Alternative partially meets/addresses criteria (1 point)
- Alternative does not meet/address criteria (0 points)

Abbreviations:
ARARs = applicable or relevant and appropriate requirements
COCs = chemicals of concern
MNA = monitored natural attenuation

FIGURES



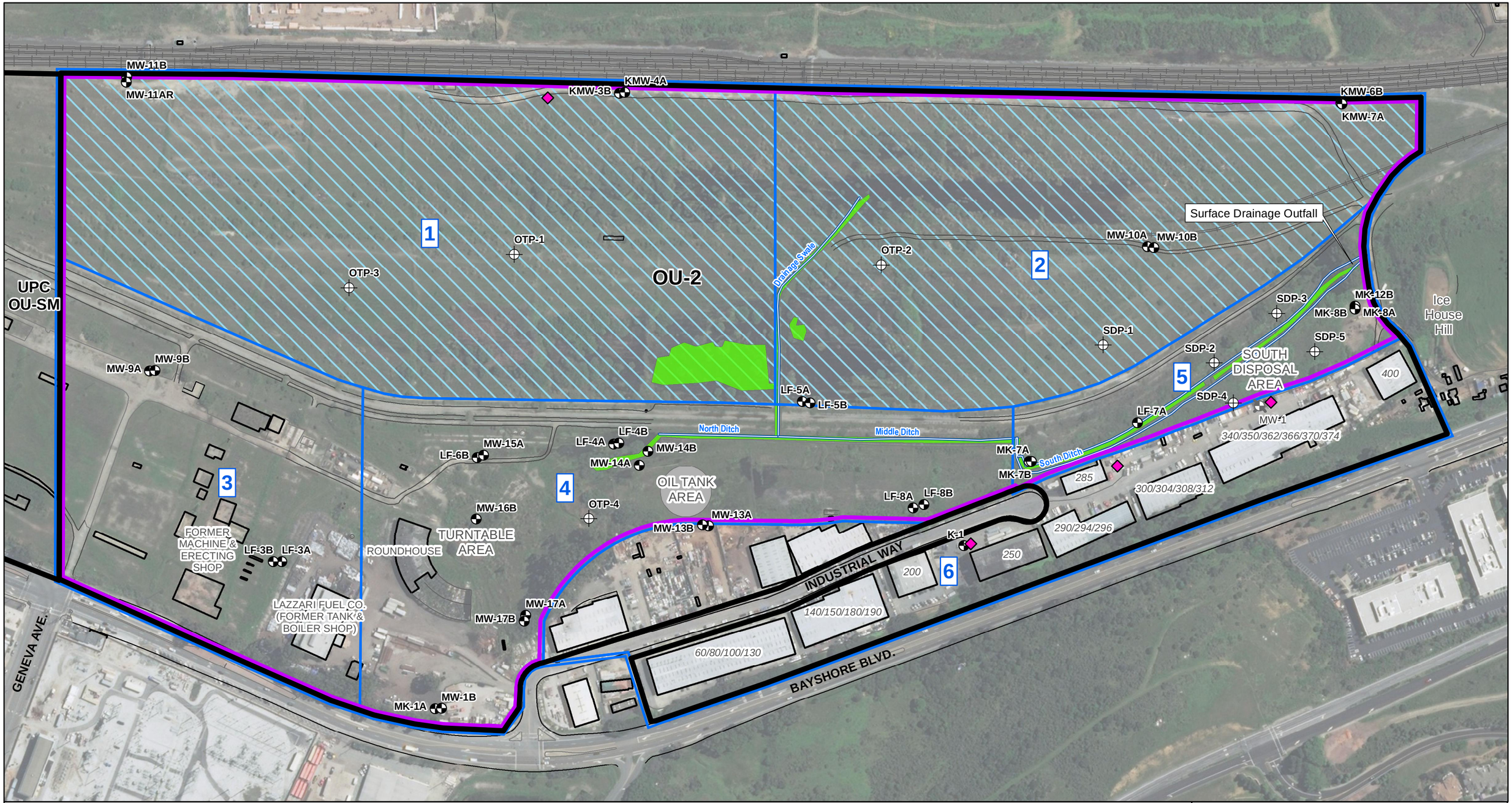
Site Location Map

Brisbane Baylands OU-2
Brisbane, California

Geosyntec consultants

WG2556	December 2021	Figure 1

\\Oakland-01\data\GIS\UPC\Brisbane\Project\2019_OU2_RAP\Fig01_SiteLocation_OU2.mxd 9/6/2019 11:55:54 AM



Legend

- Groundwater Monitoring Well
- Destroyed Groundwater Monitoring Well
- Piezometer Location
- Former UST Location
- Switching Yard
- Site Boundary
- OU2 Boundary
- Sampling Zone
- Railroad Tracks
- Current/Former Building Footprint

Industrial Way Properties
200 - historical address

- Drainage Ditch
- Wetlands (B&M, 2004)
- Approximate Former Oil Tank

Notes:
- All locations are approximate
- Basemap Source: Burns & McDonnell, 2006.
- Aerial Image Source: DigitalGlobe, 2017.

N

0 260 Feet

Site Plan and Well Locations

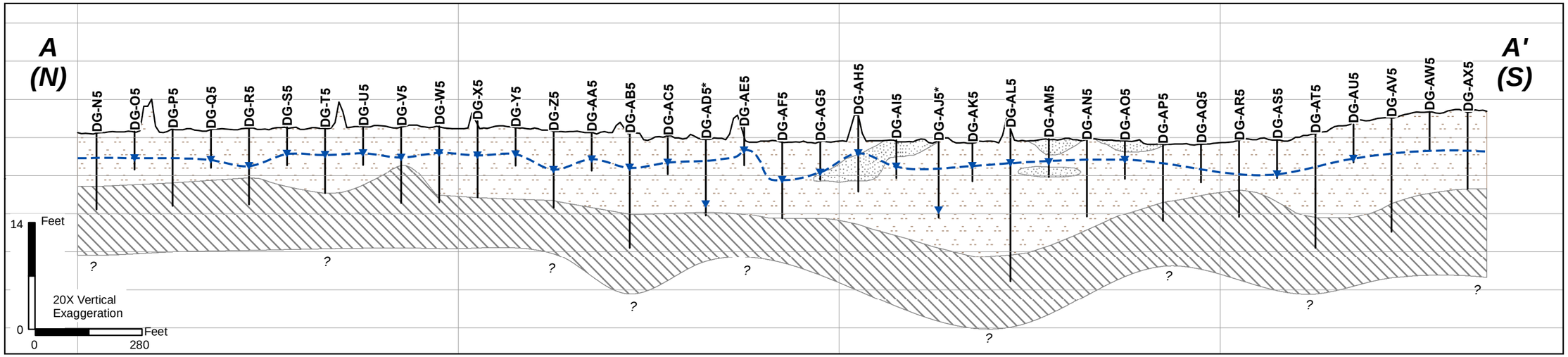
Brisbane Baylands OU-2
Brisbane, California

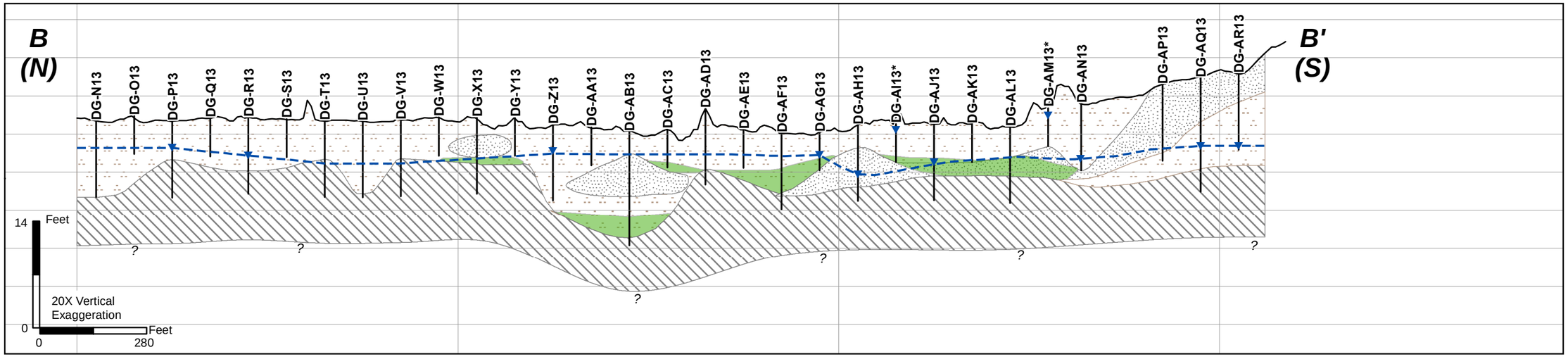
Geosyntec consultants

WG2556 | December 2021

Figure 2

D:\GIS\UPC\Brisbane\Project\2019_OU2_RAP\Fig02_SitePlanWellLocsV2.mxd 9/28/2020 4:45:29 PM



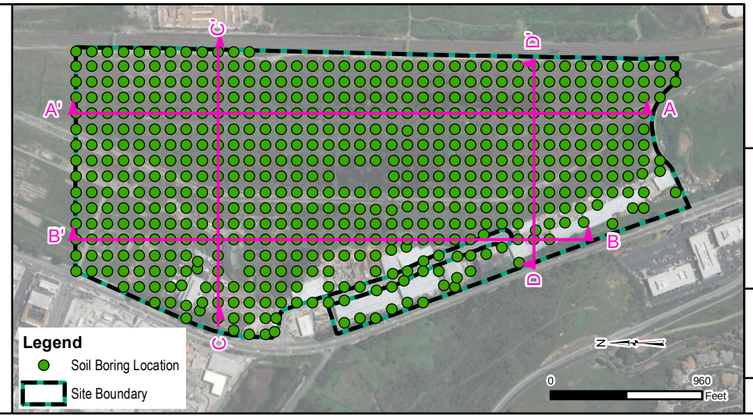


Legend

- Clay and/or Silt (Young Bay Mud)
- Coarse-Grained Fill
- Fine-Grained Fill
- Separate-Phase Hydrocarbons Observed
- Interpreted Water Table
- Ground Surface (NAVD88)

Notes:

* Water level may be anomalous due to drainage from coarse-grained material or stormwater infiltration during sampling.
ft = feet
ft MSL = feet above Mean Sea Level
NAVD88 = North American Vertical Datum of 1988



Geologic Cross-Sections A-A' and B-B'

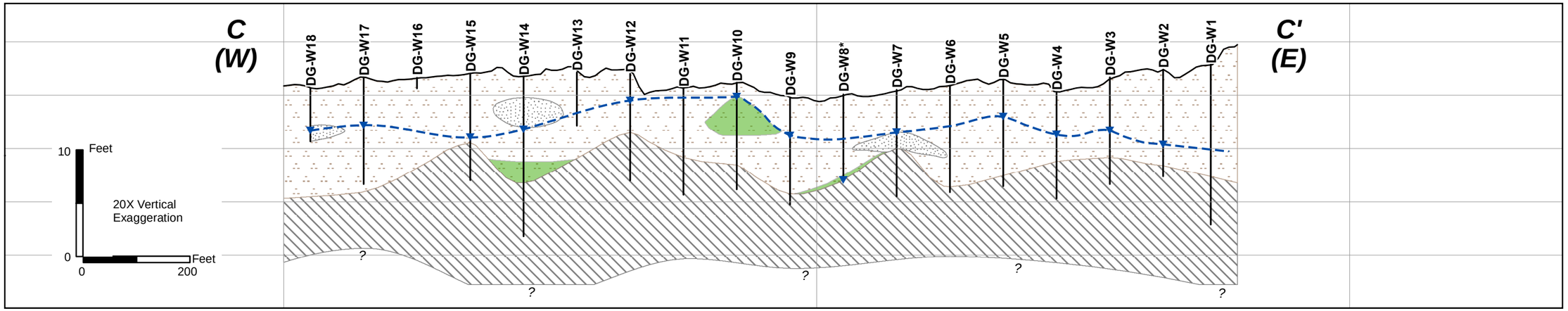
Brisbane Baylands OU-2
Brisbane, California

Geosyntec consultants

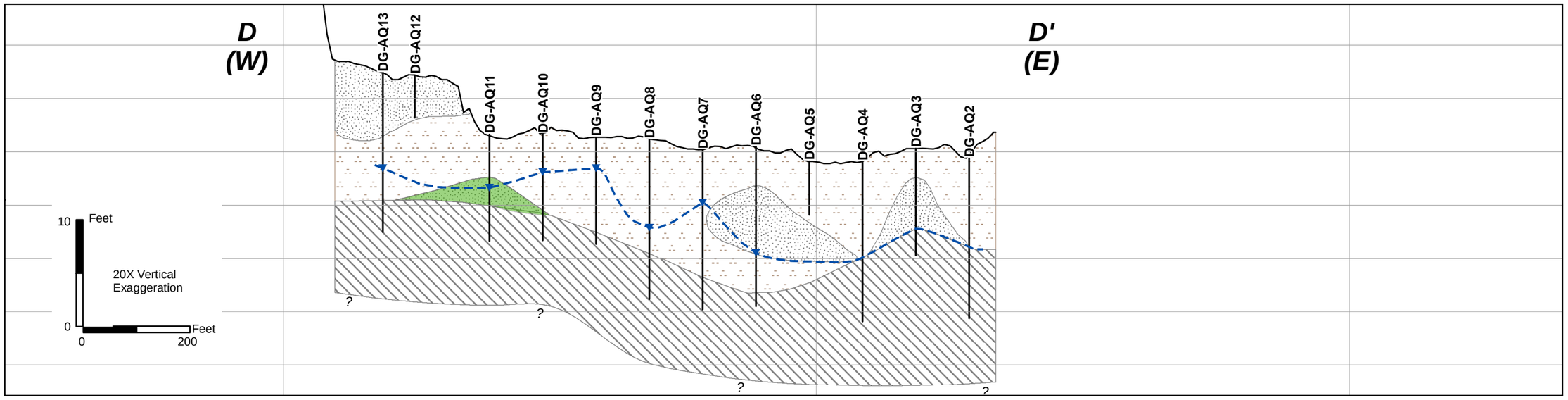
WG2556 | December 2021

Figure 3a

\\Oakland-01\data\GIS\UPC\Brisbane\Project\2019_OU2_RAP\Fig03a_CrossSectionsA_B.mxd



Distance (ft)



Distance (ft)

Legend

- Clay and/or Silt (Young Bay Mud)
- Coarse-Grained Fill
- Fine-Grained Fill
- Separate-Phase Hydrocarbons Observed
- Interpreted Water Table
- Ground Surface (NAVD88)

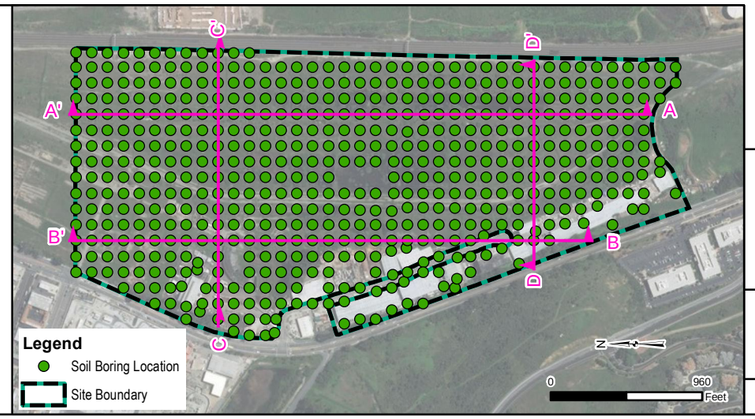
Notes:

* Water level may be anomalous due to drainage from coarse-grained material or stormwater infiltration during sampling

ft = feet

ft MSL = feet above Mean Sea Level

NAVD88 = North American Vertical Datum of 1988



Geologic Cross-Sections C-C' and D-D'

Brisbane Baylands OU-2
Brisbane, California

Geosyntec consultants

WG2556 | December 2021

Figure 3b

\\Oakland-01\data\GIS\UPC\Brisbane\Project\2019_OU2_RAP\Fig03b_CrossSectionsC_D.mxd

MW-11AR 4.40
MW-4A 4.79
KMW-4A 5.80
MW-15 8.11
MW-7A 4.72
KMW-7A 5.74
MW-10A 4.53
MK-8A 6.03
SDP-3
SDP-1
SDP-2
SOUTH DISPOSAL AREA
Ice House Hill
LF-5A 5.71
LF-4A 6.00
MW-15A 4.90
MW-1
LF-7A 5.20
MK-7A 5.14
OIL TANK AREA
MW-13A 4.42
LF-8A 5.33
K-1
FORMER MACHINE & ERECTING SHOP
LF-3A 5.93
TURNTABLE AREA
ROUNDHOUSE
LAZZARI FUEL CO. (FORMER TANK & BOILER SHOP)
MW-17A 5.89
MK-1A 5.77
4.5
5
5.5
6

Legend

- Groundwater Monitoring Well
- Destroyed Groundwater Monitoring Well
- Piezometer Location
- Former UST Location
- Groundwater Elevation Contour (ft MSL)
- Wetlands (B&M, 2004)
- Approximate Former Oil Tank Location
- Site Boundary
- Railroad Tracks
- Current/Former Building Footprint

Notes:
ft MSL = feet above mean sea level
All locations are approximate.

N

0 260 Feet

Fill Groundwater Elevation Contours (December 2018)

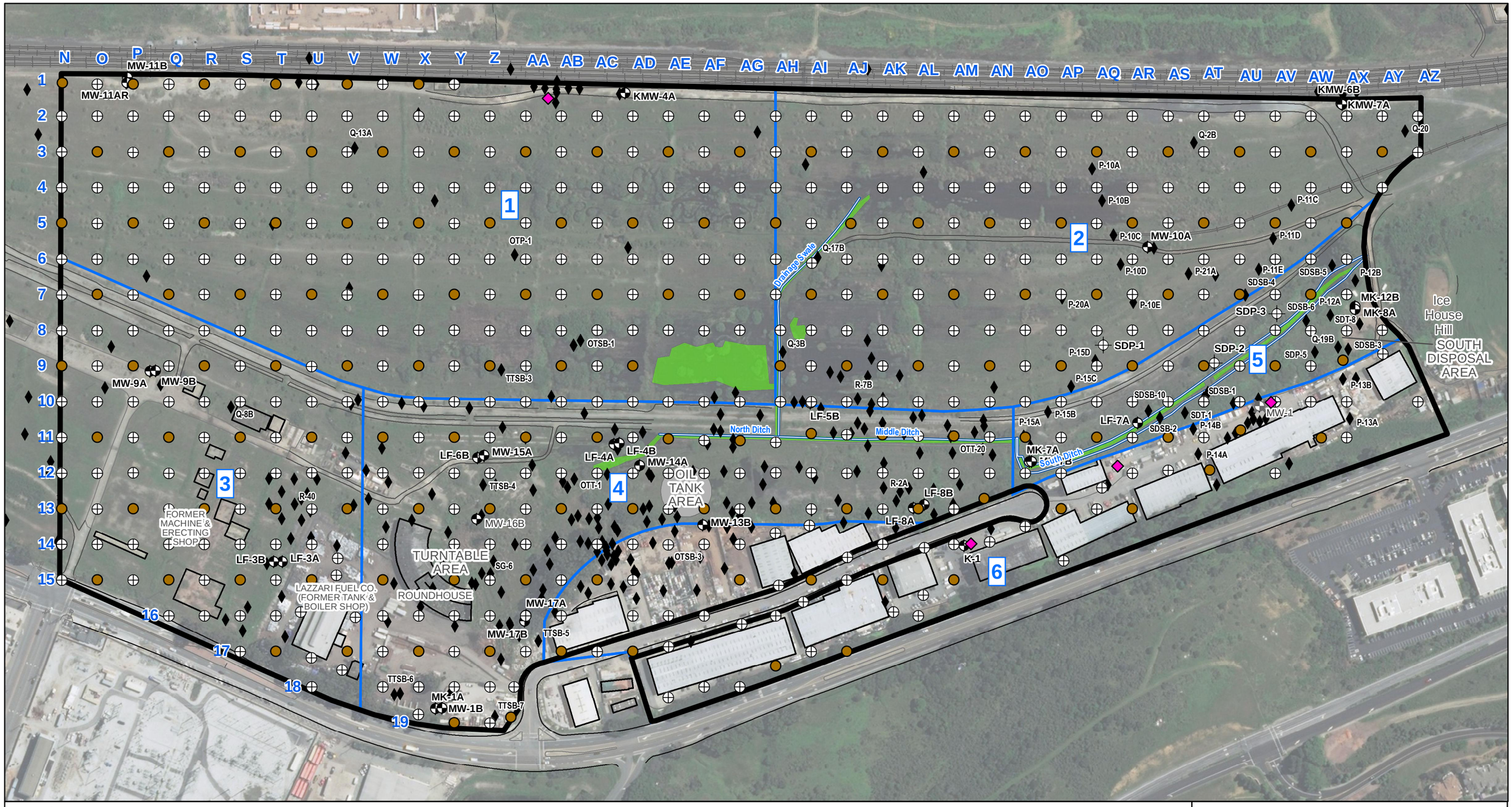
Brisbane Baylands OU-2
Brisbane, California

Geosyntec consultants

WG2556 | December 2021

Figure 4

D:\GIS\UPC\Brisbane\Project\2019_OU2_RAP\Fig04_GWE_Fill.mxd 5/6/2020 3:30:41 PM



Legend

Sample Location and Soil Analyses
- Metals
- Metals, VOCs, SVOCs, PCBs, OCPs, TPH, Asbestos
- Historical Sample Location
- Groundwater Monitoring Well
- Destroyed Groundwater Monitoring Well
- Piezometer Location
- Former UST Location
- Drainage Ditch
- Sampling Zone
- Wetlands (B&M, 2004)
- Approximate Former Oil Tank Location
- Site Boundary
- Railroad Tracks
- Current/Former Building Footprint

Notes:
OCPs = organochlorine pesticides
PCBs = polychlorinated biphenyls
TPH = total petroleum hydrocarbons
SVOCs = semivolatile organic compounds
VOCs = volatile organic compounds
All locations are approximate.

N

0 260 Feet

Soil Sample Locations

Brisbane Baylands OU-2
Brisbane, California

Geosyntec consultants

WG2556 | December 2021

Figure 5

D:\GIS\UPC\Brisbane\Project\2019_OU2_RAP\Fig05_SoilSampleLocations.mxd 10/4/2020 7:28:22 AM



Legend

- Sample Location, exceeds screening level at shallow depth (0.5-1 or 1-1.5 ft bgs)
- Sample Location, exceeds screening level at intermediate depth (3.5-4 ft bgs)
- Sample Location, exceeds screening level at deep depth (depth varies)
- Sample Location, does not exceed screening level at shallow depth (0.5-1 or 1-1.5 ft bgs)
- Sample Location, does not exceed screening level at intermediate depth (3.5-4 ft bgs)
- Sample Location, does not exceed screening level at deep depth (depth varies)

Arsenic concentrations shown in Table 2.

- Groundwater Monitoring Well
- Destroyed Groundwater Monitoring Well
- Former UST Location
- Drainage Ditch
- Sampling Zone
- Wetlands (B&M, 2004)
- Approximate Former Oil Tank Location
- Site Boundary
- Railroad Tracks
- Current/Former Building Footprint

N

0 260 Feet

Notes:
mg/kg = milligrams per kilogram
ft bgs = feet below ground surface
Arsenic screening level in soil = 19 mg/kg
All locations are approximate.
Well IDs not included due to space limitation; refer to Figure 2.

Arsenic Concentrations in Soil

Brisbane Baylands OU-2
Brisbane, California

Geosyntec consultants

WG2556 | December 2021

Figure 6

D:\GIS\UPC\Brisbane\Project\2019_OU2_RAP\Fig06_Arsenic_SO.mxd 9/28/2020 3:40:59 PM



Legend

- Sample Location, exceeds screening level at shallow depth (0.5-1 or 1-1.5 ft bgs)
- Sample Location, exceeds screening level at intermediate depth (3.5-4 ft bgs)
- Sample Location, exceeds screening level at deep depth (depth varies)

Lead concentrations shown in Table 2.

- Sample Location, does not exceed screening level at shallow depth (0.5-1 or 1-1.5 ft bgs)
- Sample Location, does not exceed screening level at intermediate depth (3.5-4 ft bgs)
- Sample Location, does not exceed screening level at deep depth (depth varies)

- Groundwater Monitoring Well
- Destroyed Groundwater Monitoring Well
- Former UST Location
- Drainage Ditch
- Sampling Zone
- Wetlands (B&M, 2004)
- Approximate Former Oil Tank Location
- Site Boundary
- Railroad Tracks
- Current/Former Building Footprint

N

0 260 Feet

Notes:
mg/kg = milligrams per kilogram
ft bgs = feet below ground surface.
Lead screening level in soil = 80 mg/kg
All locations are approximate.
Well IDs not included due to space limitation; refer to Figure 2.

Lead Concentrations in Soil

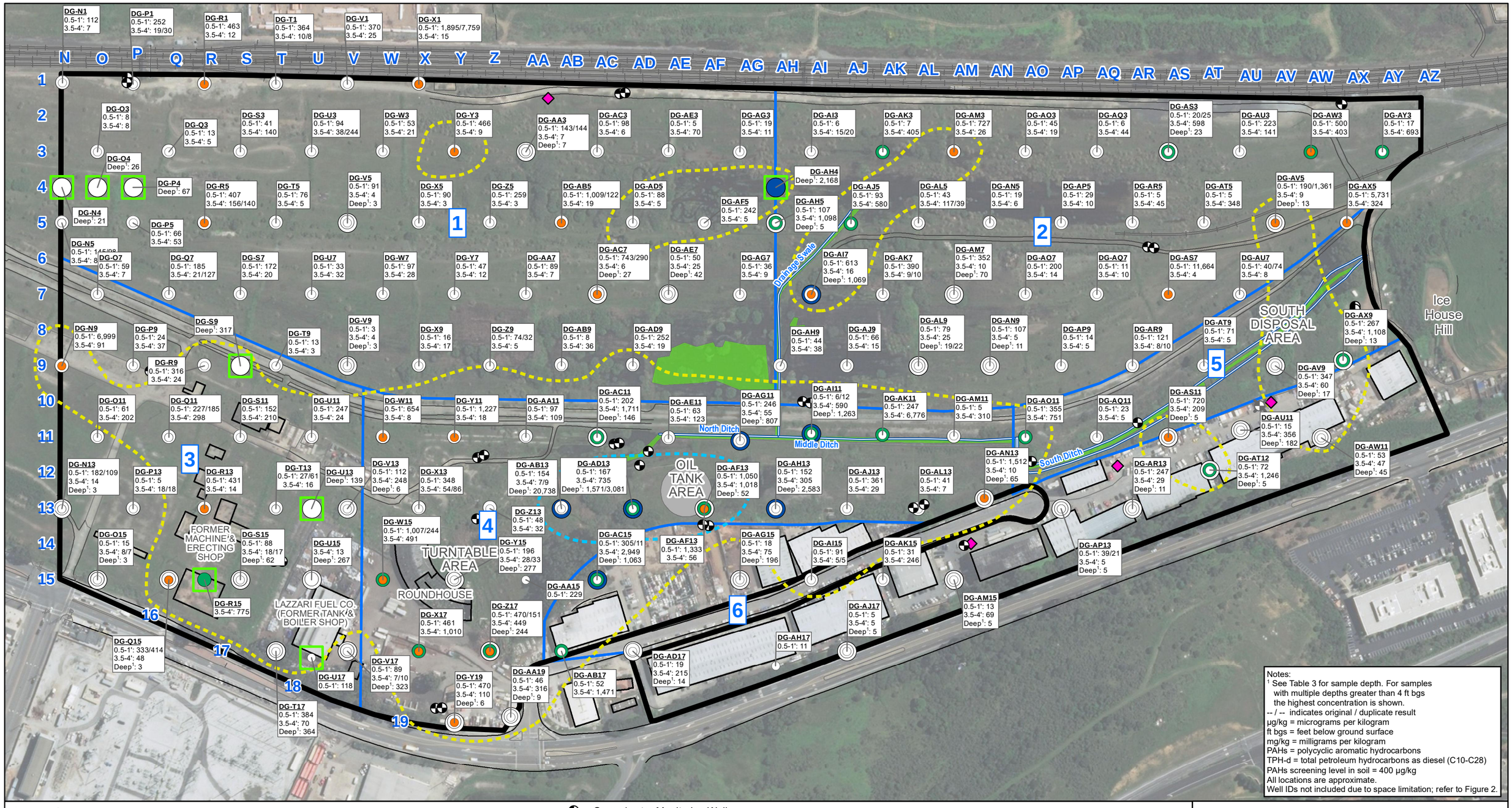
Brisbane Baylands OU-2
Brisbane, California

Geosyntec consultants

WG2556 | December 2021

Figure 7

\\Oakland-01\data\GIS\UPC\Brisbane\Project\2019_OU2_RAP\Fig07_Lead_SO.mxd 8/10/2020 3:13:56 PM



Notes:
[1] See Table 3 for sample depth. For samples with multiple depths greater than 4 ft bgs the highest concentration is shown.
-- / -- indicates original / duplicate result
µg/kg = micrograms per kilogram
ft bgs = feet below ground surface
mg/kg = milligrams per kilogram
PAHs = polycyclic aromatic hydrocarbons
TPH-d = total petroleum hydrocarbons as diesel (C10-C28)
PAHs screening level in soil = 400 µg/kg
All locations are approximate.
Well IDs not included due to space limitation; refer to Figure 2.

Legend

- Sample Location, exceeds screening level at shallow depth (0.5-1 or 1-1.5 ft bgs)
- Sample Location, exceeds screening level at intermediate depth (3.5-4 ft bgs)
- Sample Location, exceeds screening level at deep depth (depth varies)
- Locations added during investigation due to observation at neighboring boring(s) suggesting possible presence of separate-phase liquid
- Sample Location, does not exceed screening level at shallow depth (0.5-1 or 1-1.5 ft bgs)
- Sample Location, does not exceed screening level at intermediate depth (3.5-4 ft bgs)
- Sample Location, does not exceed screening level at deep depth (depth varies)

Benzo(a)pyrene equivalent total PAHs and TPH concentrations shown in Table 3.

- Groundwater Monitoring Well
- Destroyed Groundwater Monitoring Well
- Former UST Location
- Drainage Ditch
- Sampling Zone
- Wetlands (B&M, 2004)
- Approximate Former Oil Tank Location
- Site Boundary
- Railroad Tracks
- Current/Former Building Footprint

TPH-d Concentration Contours in Soil
- 50,000 mg/kg TPH-d
- 260 mg/kg TPH-d

N
0 260 Feet

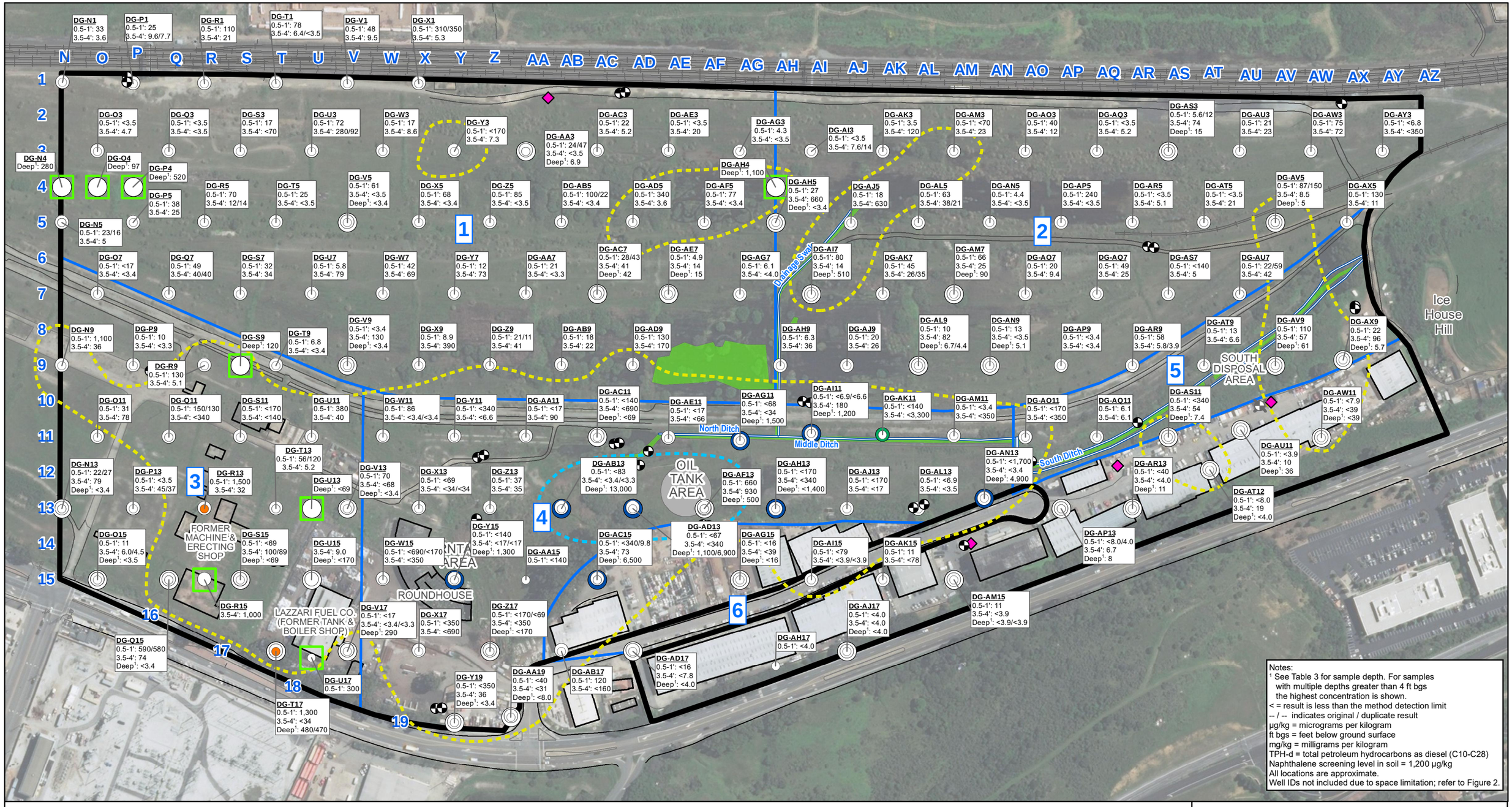
Benzo(a)pyrene Equivalent Total PAHs Concentrations in Soil

Brisbane Baylands OU-2
Brisbane, California

Geosyntec consultants

WG2556	December 2021	Figure 8

\\Oakland-01\data\GIS\UPC\Brisbane\Project\2019_OU2_RAP\Fig08_PAHs_SO.mxd 8/10/2020 2:59:38 PM



Legend

- Sample Location, exceeds screening level at shallow depth (0.5-1 or 1-1.5 ft bgs)
- Sample Location, exceeds screening level at intermediate depth (3.5-4 ft bgs)
- Sample Location, exceeds screening level at deep depth (depth varies)
- Locations added during investigation due to observation at neighboring boring(s) suggesting possible presence of separate-phase liquid
- Sample Location, does not exceed screening level at shallow depth (0.5-1 or 1-1.5 ft bgs)
- Sample Location, does not exceed screening level at intermediate depth (3.5-4 ft bgs)
- Sample Location, does not exceed screening level at deep depth (depth varies)

Naphthalene concentrations shown are the maximum between concentrations in Tables 3 and 5.

- Groundwater Monitoring Well
- Destroyed Groundwater Monitoring Well
- Former UST Location
- Drainage Ditch
- Sampling Zone
- Wetlands (B&M, 2004)
- Approximate Former Oil Tank Location
- Site Boundary
- Railroad Tracks
- Current/Former Building Footprint

TPH-d Concentration Contours in Soil
- 50,000 mg/kg TPH-d
- 260 mg/kg TPH-d

N

0 260 Feet

Naphthalene Concentrations in Soil

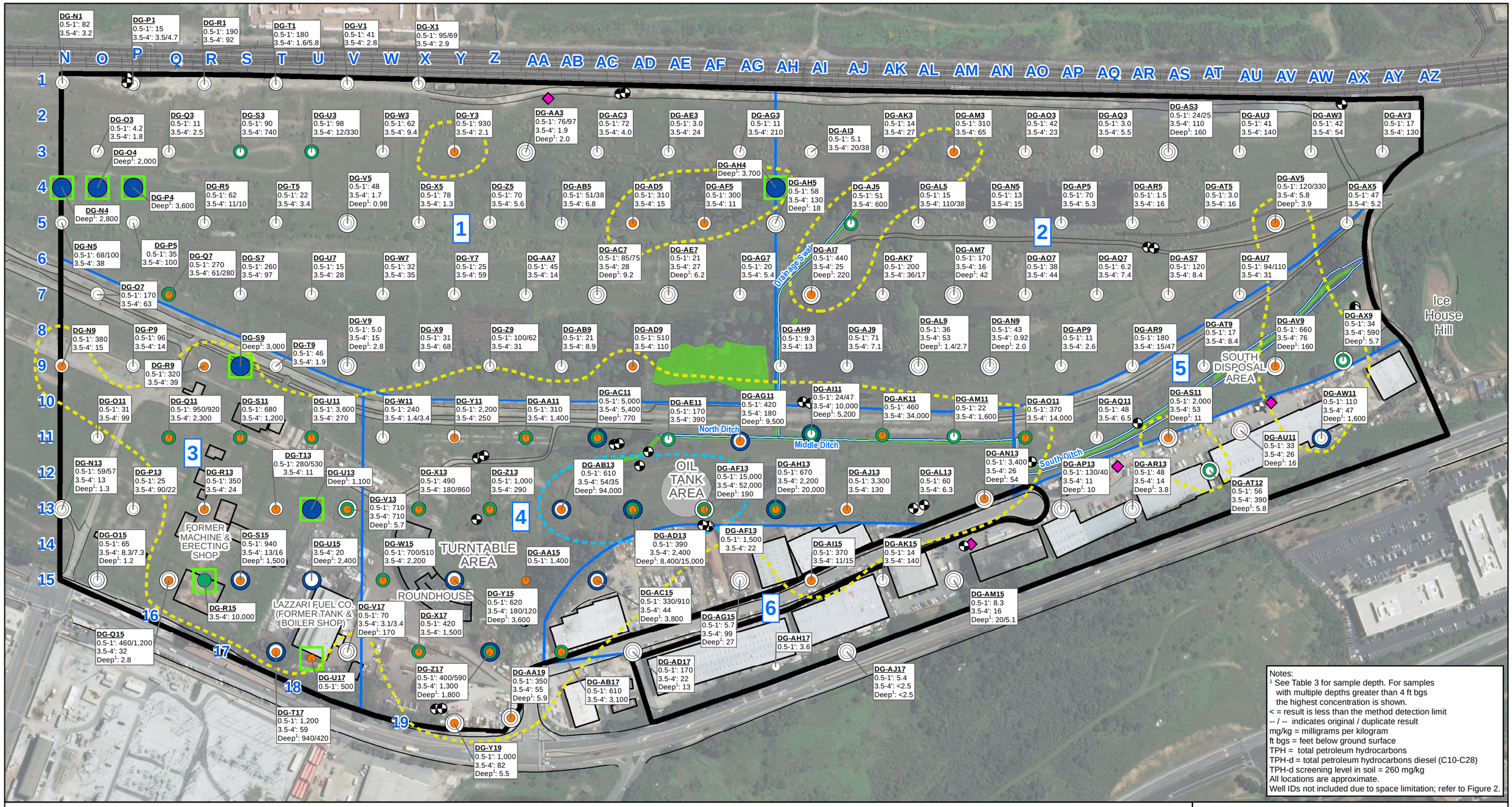
Brisbane Baylands OU-2
Brisbane, California

Geosyntec consultants

WG2556 | December 2021

Figure 9

\\Oakland-01\data\GIS\UPC\Brisbane\Project\2019_OU2_RAP\Fig09_Naphthalene_SO.mxd 8/10/2020 3:06:37 PM



Notes:
[1] See Table 3 for sample depth. For samples with multiple depths greater than 4 ft bgs the highest concentration is shown.
< = result is less than the method detection limit
-- / -- indicates original / duplicate result
mg/kg = milligrams per kilogram
ft bgs = feet below ground surface
TPH = total petroleum hydrocarbons
TPH-d = total petroleum hydrocarbons diesel (C10-C28)
TPH-d screening level in soil = 260 mg/kg
All locations are approximate.
Well IDs not included due to space limitation; refer to Figure 2.

Legend

- Sample Location, exceeds screening level at shallow depth (0.5-1 or 1-1.5 ft bgs)
- Sample Location, exceeds screening level at intermediate depth (3.5-4 ft bgs)
- Sample Location, exceeds screening level at deep depth (depth varies)
- Sample Location, does not exceed screening level at shallow depth (0.5-1 or 1-1.5 ft bgs)
- Sample Location, does not exceed screening level at intermediate depth (3.5-4 ft bgs)
- Sample Location, does not exceed screening level at deep depth (depth varies)
- Locations added during investigation due to observation at neighboring boring(s) suggesting possible presence of separate-phase liquid
- Groundwater Monitoring Well
- Destroyed Groundwater Monitoring Well
- Former UST Location
- Drainage Ditch
- Sampling Zone
- Wetlands (B&M, 2004)
- Approximate Former Oil Tank
- Site Boundary
- Railroad Tracks
- Current/Former Building Footprint

TPH-d Concentration Contours in Soil
- 50,000 mg/kg TPH-d
- 260 mg/kg TPH-d

N
0 260 Feet

Petroleum Hydrocarbon Concentrations in Soil (TPH-d)

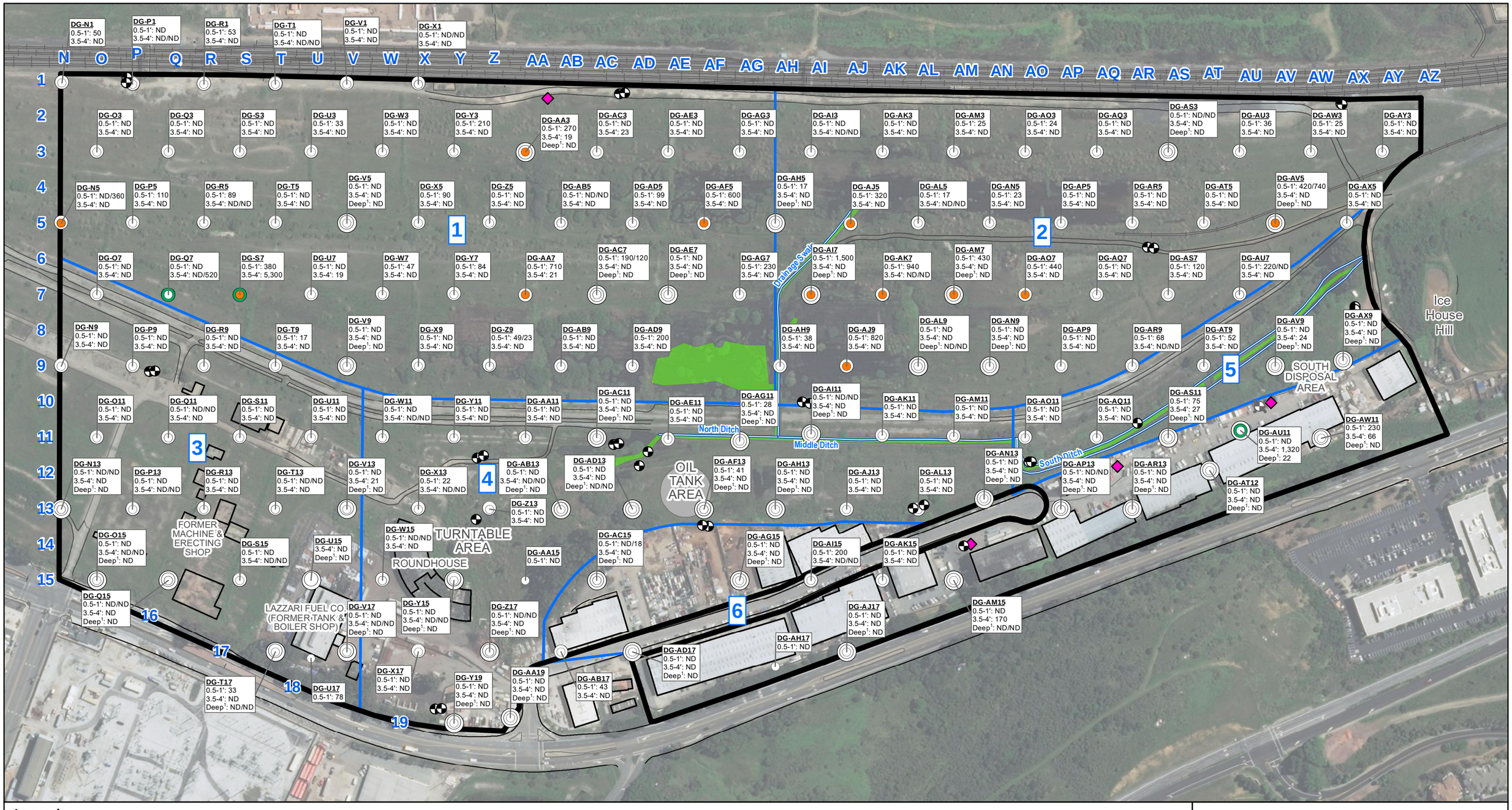
Brisbane Baylands OU-2
Brisbane, California

Geosyntec consultants

WG2556 | December 2021

Figure 10

\\Oakland-01\data\GIS\UPC\Brisbane\Project\2019_OU2_RAP\Fig10_TPHd_SO.mxd 8/10/2020 3:05:39 PM



Legend

- Sample Location, exceeds screening level at shallow depth (0.5-1 or 1-1.5 ft bgs)
- Sample Location, exceeds screening level at intermediate depth (3.5-4 ft bgs)
- Sample Location, does not exceed screening level at shallow depth (0.5-1 or 1-1.5 ft bgs)
- Sample Location, does not exceed screening level at intermediate depth (3.5-4 ft bgs)
- Sample Location, does not exceed screening level at deep depth (depth varies)

Posted values are sum of detected concentrations reported as Aroclors. PCB concentrations are shown in Table 4.

- Groundwater Monitoring Well
- Destroyed Groundwater Monitoring Well
- Former UST Location
- Drainage Ditch
- Sampling Zone
- Wetlands (B&M, 2004)
- Approximate Former Oil Tank Location
- Site Boundary
- Railroad Tracks
- Current/Former Building Footprint

Notes:
[1] See Table 3 for sample depth.
-- / -- indicates original / duplicate result
ND = not detected
µg/kg = micrograms per kilogram
ft bgs = feet below ground surface
PCB = polychlorinated biphenyl
PCB screening level in soil = 230 µg/kg
All locations are approximate.
Well IDs not included due to space limitation; refer to Figure 2.

N
0 260 Feet

PCB Concentrations in Soil

Brisbane Baylands OU-2
Brisbane, California

Geosyntec consultants

WG2556 | December 2021

Figure 11

\\Oakland-01\data\GIS\UPC\Brisbane\Project\2019_OU2_RAP\Fig11_TotalPCBs_SO.mxd 8/10/2020 3:04:08 PM



Notes:
µg/kg = micrograms per kilogram
ft bgs = feet below ground surface
VOC = Volatile Organic Compound
PCE = Tetrachloroethene
TCE = Trichloroethene
cDCE = cis-1,2-Dichloroethene
VC = Vinyl Chloride
PCE screening level in soil = 590 µg/kg
TCE screening level in soil = 950 µg/kg
cDCE screening level in soil = 19,000 µg/kg
VC screening level in soil = 8.3 µg/kg
- For samples with detections only the maximum result is presented.
- All locations are approximate.

Legend

2019 Soil Sample Location (only detections are labeled)

- Sample Location, does not exceed screening level at deep depth (depth varies)
- Sample Location, does not exceed screening level at intermediate depth (3.5-4 ft bgs)
- Sample Location, does not exceed screening level at shallow depth (0.5-1 or 1-1.5 ft bgs)

Historical Soil Sample Location (B&M, 2002, 2007)

- Sample Location, exceeds screening level at shallow depth (0.5-1 or 1-1.5 ft bgs)
- Sample Location, exceeds screening level at intermediate depth (3.5-4 ft bgs)
- Sample Location, exceeds screening level at deep depth (depth varies)

VOC concentrations shown in Table 5.

- Sample Location, does not exceed screening level at intermediate depth (3.5-4 ft bgs)
- Sample Location, does not exceed screening level at deep depth (depth varies)
- Locations added during investigation due to observation at neighboring boring(s) suggesting possible presence of separate-phase liquid

- Groundwater Monitoring Well
- Destroyed Groundwater Monitoring Well
- Former UST Location
- Drainage Ditch
- Wetlands (B&M, 2004)
- Approximate Former Oil Tank Location
- Site Boundary
- Sampling Zone
- Railroad Tracks
- Current/Former Building Footprint

N
0
260
Feet

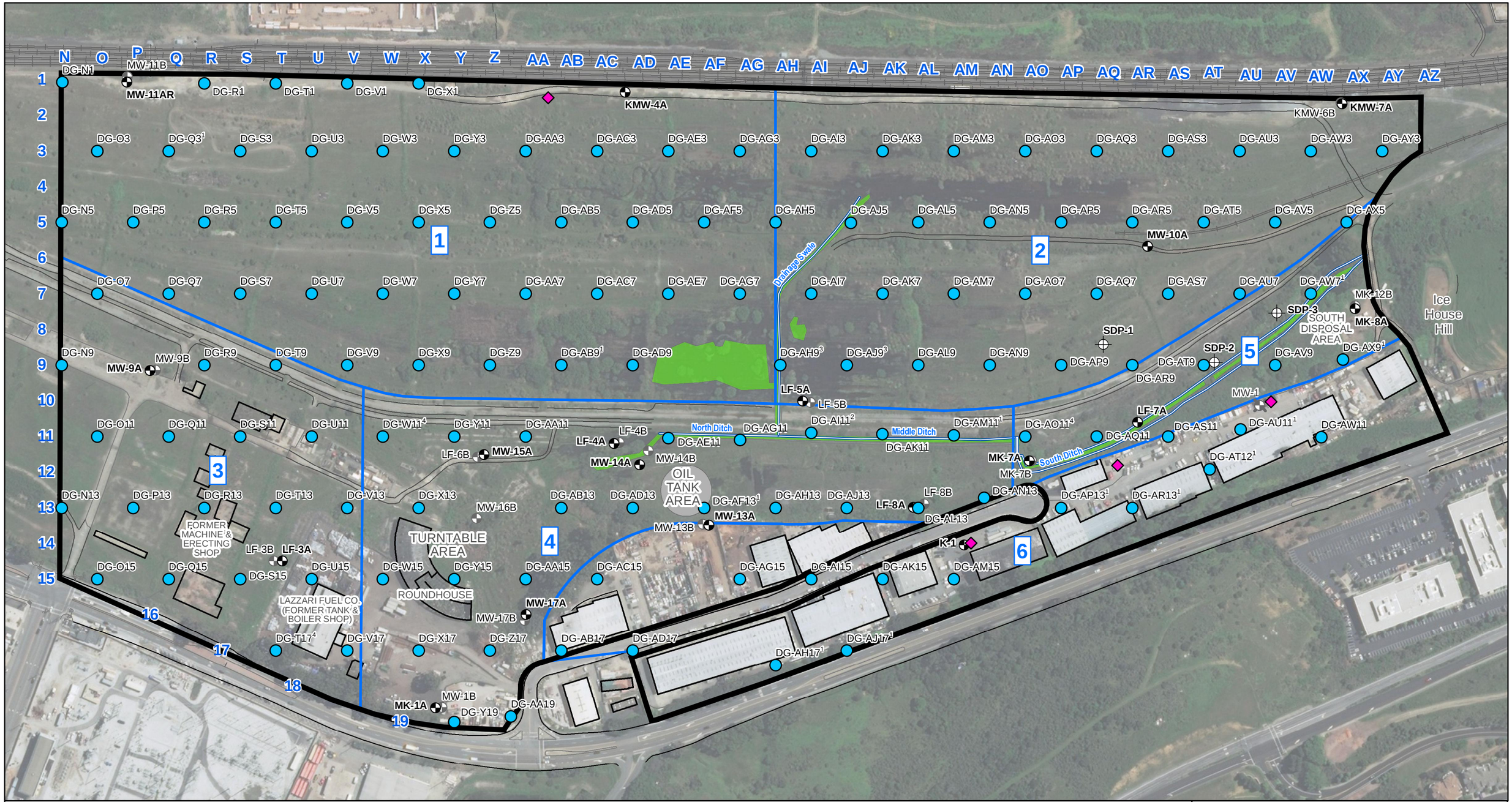
Maximum Chlorinated VOC Concentrations in Soil
Brisbane Baylands OU-2
Brisbane, California

Geosyntec consultants

WG2556 | December 2021

Figure 12

\\Oakland-01\data\GIS\UPC\Brisbane\Project\2019_OU2_RAP\Fig12_PCE_TCE_cDCE_VC_SO.mxd 8/10/2020 3:03:04 PM



Legend

- Grab Groundwater Sample Location
- Fill-zone Groundwater Monitoring Well
- Groundwater Monitoring Well Not Screened in Fill-zone (not sampled during data gap investigation)
- Destroyed Groundwater Monitoring Well
- Piezometer Location
- Former UST Location
- Drainage Ditch
- Sampling Zone
- Wetlands (B&M, 2004)
- Approximate Former Oil Tank
- Site Boundary
- Railroad Tracks
- Current/Former Building Footprint

Notes:
[1] Borehole was dry or well had no to low recharge. A sample could not be collected.
[2] Tar found in well.
[3] Location in standing water, unable to collect groundwater sample.
[4] Only sampled for VOCs due to low recharge.
VOCs = volatile organic compounds
All locations are approximate.

N

0 260 Feet

Groundwater Sample Locations

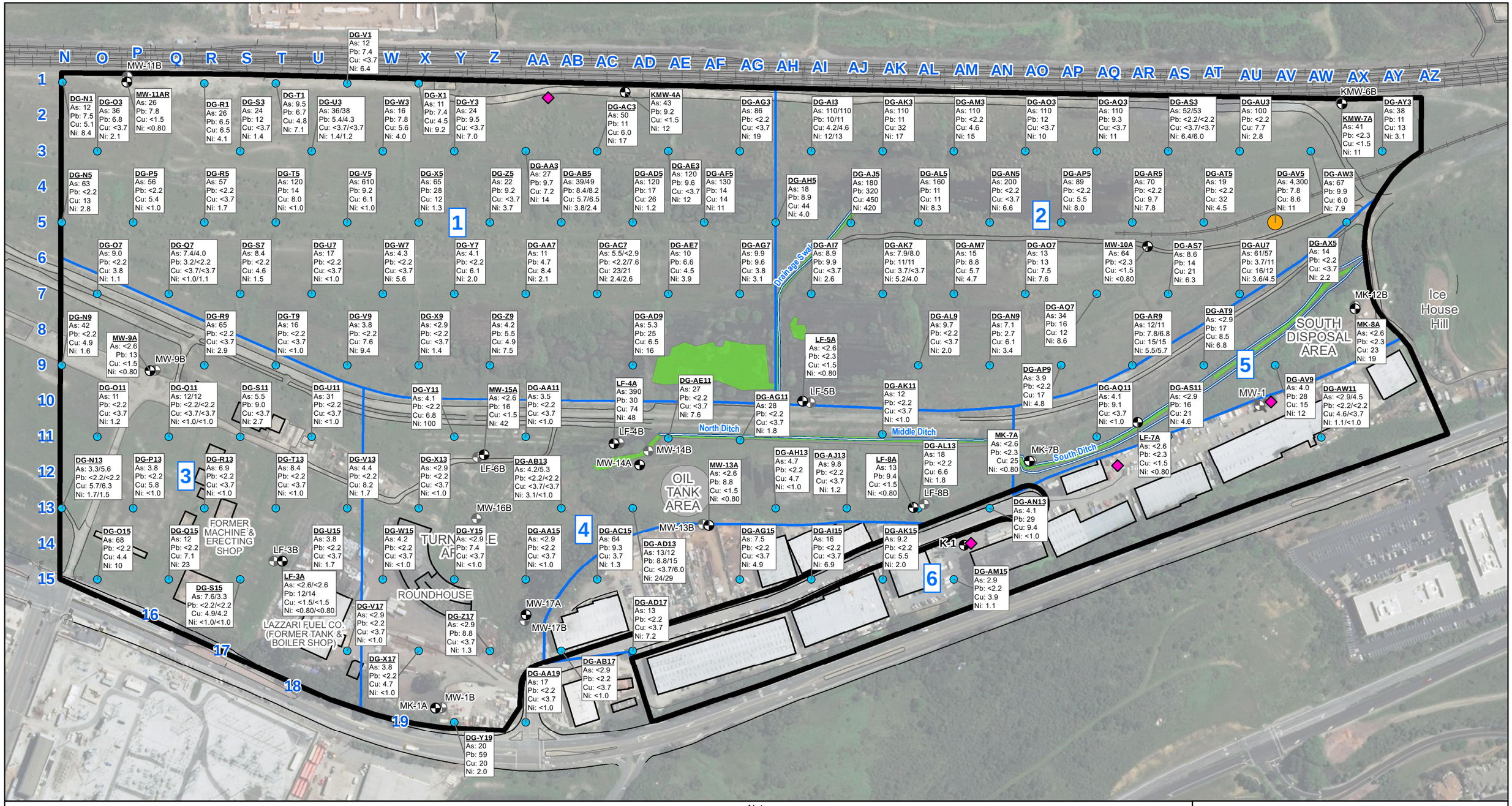
Brisbane Baylands OU-2
Brisbane, California

Geosyntec consultants

WG2556 | December 2021

Figure 13

D:\GIS\UPC\Brisbane\Project\2019_OU2_RAP\Fig13_GWSampleLocations.mxd 9/28/2020 3:55:39 PM



Legend

- Sample Location, Exceeds Screening Level for Arsenic
- Sample Location Without Exceedance
- Fill-zone Groundwater Monitoring Well
- Groundwater Monitoring Well Not Screened in Fill-zone (not sampled during data gap investigation)
- Destroyed Groundwater Monitoring Well
- Former UST Location
- Drainage Ditch
- Sampling Zone
- Wetlands (B&M, 2004)
- Approximate Former Oil Tank Location
- Site Boundary
- Railroad Tracks
- Current/Former Building Footprint

Notes:
< = result is less than the method detection limit
-- / -- indicates original / duplicate result
µg/L = microgram per liter
As = Arsenic
Pb = Lead
Cu = Copper
Ni = Nickel
Arsenic screening level in groundwater = 3,600 µg/L
Lead screening level in groundwater = 3,100 µg/L
Copper screening level in groundwater = 820 µg/L
Nickel screening level in groundwater = 8,200 µg/L
Results are reported in µg/L.
All locations are approximate.

N

0 260 Feet

Dissolved Arsenic, Lead, Copper, and Nickel Concentrations in Fill Groundwater

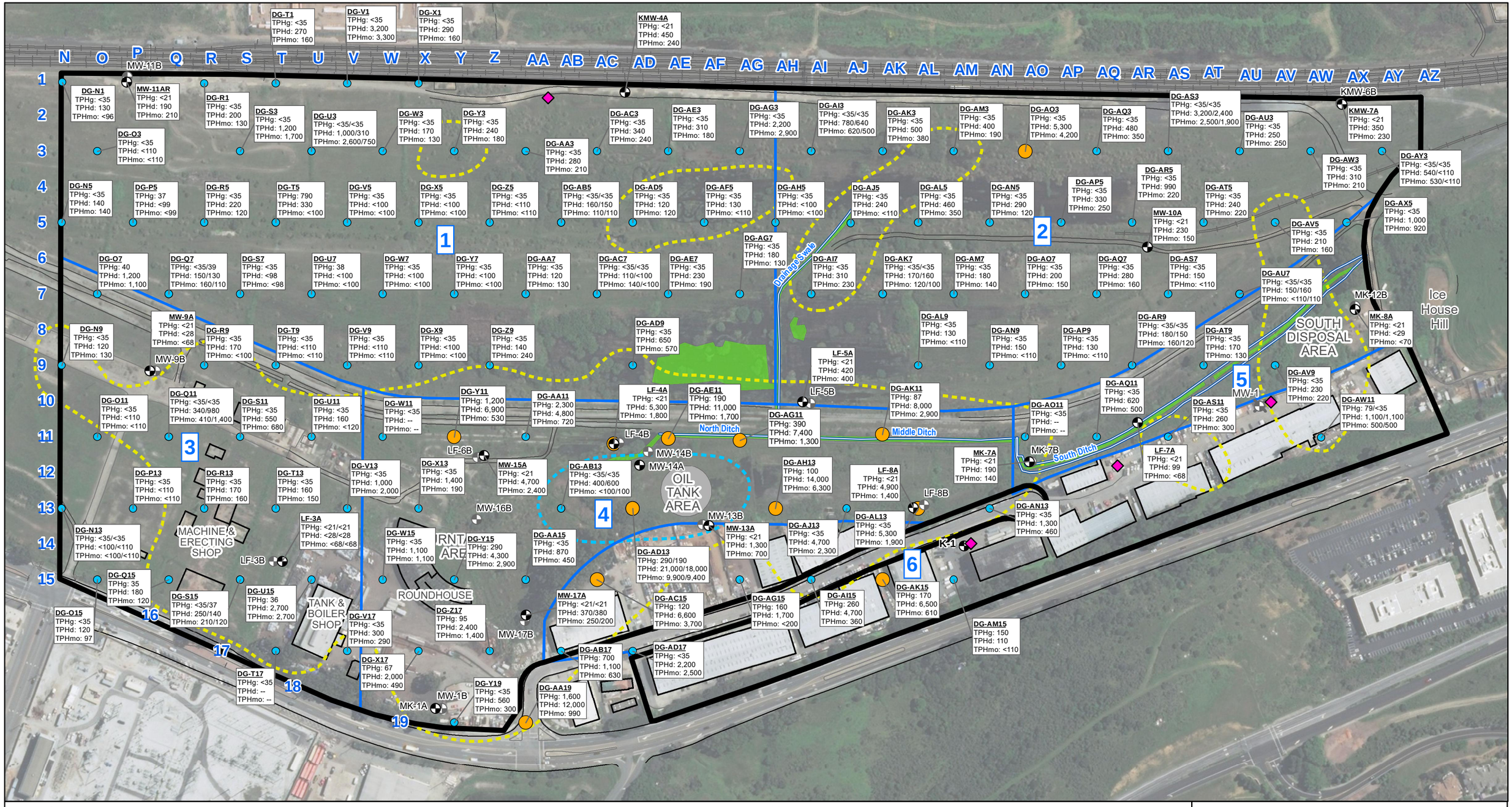
Brisbane Baylands OU-2
Brisbane, California

Geosyntec consultants

WG2556 | December 2021

Figure 14

\\Oakland-01\data\GIS\UPC\Brisbane\Project\2019_OU2_RAP\Fig14_As_Pb_Cu_Ni_GW.mxd 8/10/2020 4:19:10 PM



Legend

- TPH-d Screening Level Exceedance
- Sample Location Without TPH-d Exceedance
- Fill-zone Groundwater Monitoring Well
- Groundwater Monitoring Well Not Screened in Fill-zone (not sampled during data gap investigation)
- Destroyed Groundwater Monitoring Well

TPH-d and TPH-mo concentrations are in Table 8.

- Former UST Location
- Drainage Ditch
- Sampling Zone
- Wetlands (B&M, 2004)
- Approximate Former Oil Tank
- Site Boundary
- Railroad Tracks
- Current/Former Building Footprint

TPH-d Concentration Contours in Soil

- 50,000 mg/kg TPH-
- 260 mg/kg TPH-d

Notes:
< = result is less than the method detection limit
-- / -- indicates original / duplicate result
µg/L = microgram per liter
mg/kg = milligrams per kilogram
TPH = total petroleum hydrocarbons
TPH-g = total petroleum hydrocarbons in the gasoline range (C4-C12)
TPH-d = total petroleum hydrocarbons in the diesel range (C10-C28)
TPH-mo = total petroleum hydrocarbons in the motor oil range (C24-C36)
TPH-g screening level in groundwater = 3,700 µg/L (no exceedances)
TPH-d screening level in groundwater = 5,000 µg/L
No screening level for TPH-mo in groundwater.
Results are reported in µg/L.
All locations are approximate.

N

0 260 Feet

Petroleum Hydrocarbon Concentrations in Fill Groundwater

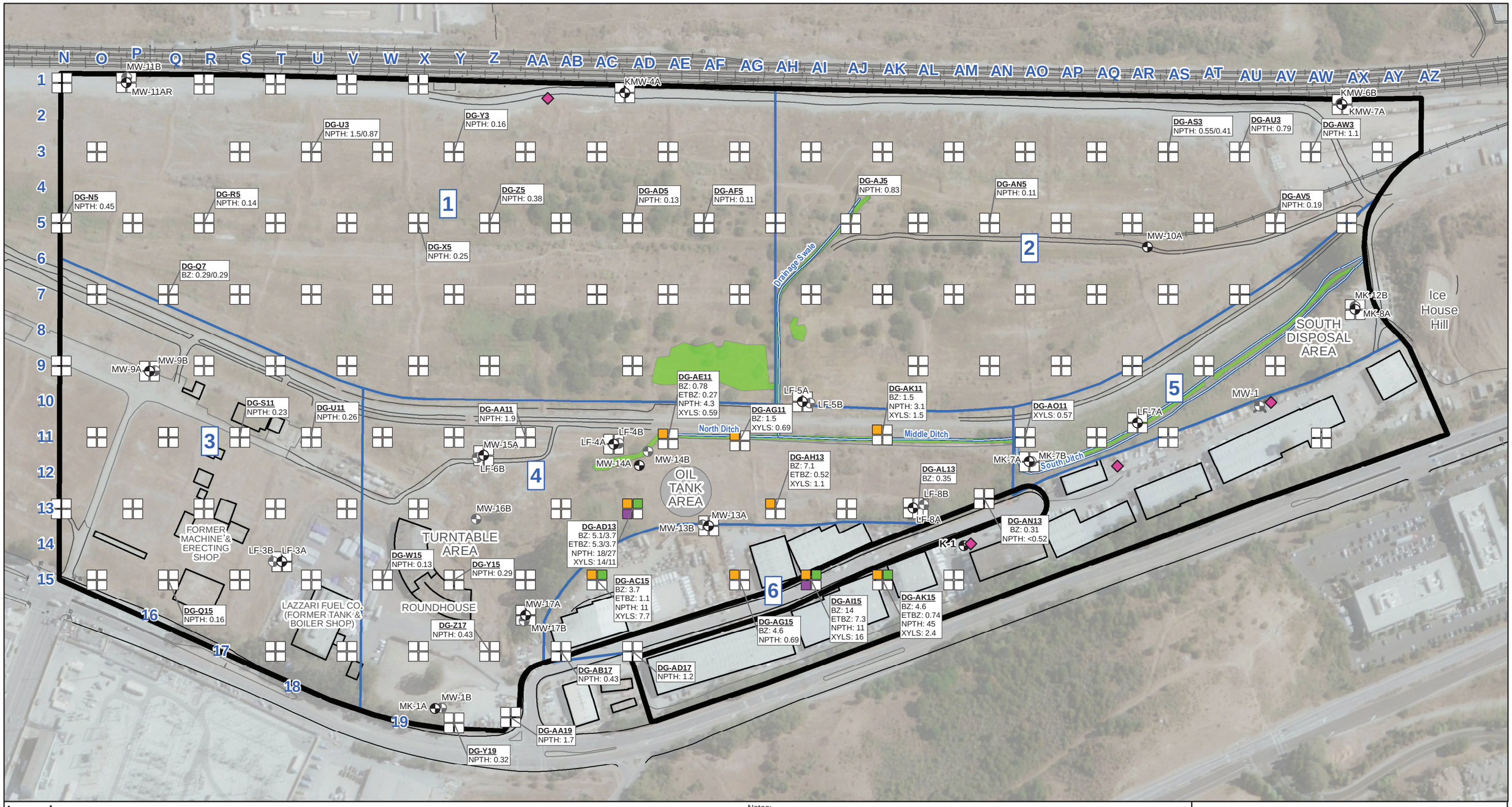
Brisbane Baylands OU-2
Brisbane, California

Geosyntec consultants

WG2556 | December 2021

Figure 15

D:\GIS\UPC\Brisbane\Project\2019_OU2_RAP\Fig15_TPH_GW.mxd 10/5/2020 9:53:30 AM



Legend

2019 Groundwater Sample Location
(only detections are labeled)

- Sample Location, Exceeds Screening Level for BZ
- Sample Location, Exceeds Screening Level for ETBZ
- Sample Location, Exceeds Screening Level for NPTH
- Sample Location, Exceeds Screening Level for XYLS

Benzene, ethylbenzene and total xylenes concentrations are shown in Table 9. The maximum naphthalene concentration is shown from Tables 8 and 9.

- Fill-zone Groundwater Monitoring Well
- Groundwater Monitoring Well Not Screened in Fill-zone (not sampled during data gap investigation)
- Destroyed Groundwater Monitoring Well
- Former UST Location

- Drainage Ditch
- Wetlands (B&M, 2004)
- Approximate Former Oil Tank Location
- Site Boundary
- Sampling Zone
- Railroad Tracks
- Current/Former Building Footprint

Notes:
< = result is less than the method detection limit
-- / -- indicates original / duplicate result
µg/L = microgram per liter
BZ = Benzene
ETBZ = Ethylbenzene
NPTH = Naphthalene
XYLS = Total xylenes
Benzene screening level in groundwater = 0.42 µg/L
Ethylbenzene screening level in groundwater = 3.5 µg/L
Naphthalene screening level in groundwater = 4.6 µg/L
Total xylenes screening level in groundwater = 390 µg/L
Results are reported in µg/L.
All locations are approximate.

N

0 260 Feet

Benzene, Ethylbenzene, Total Xylenes, and Naphthalene Concentrations in Fill Groundwater

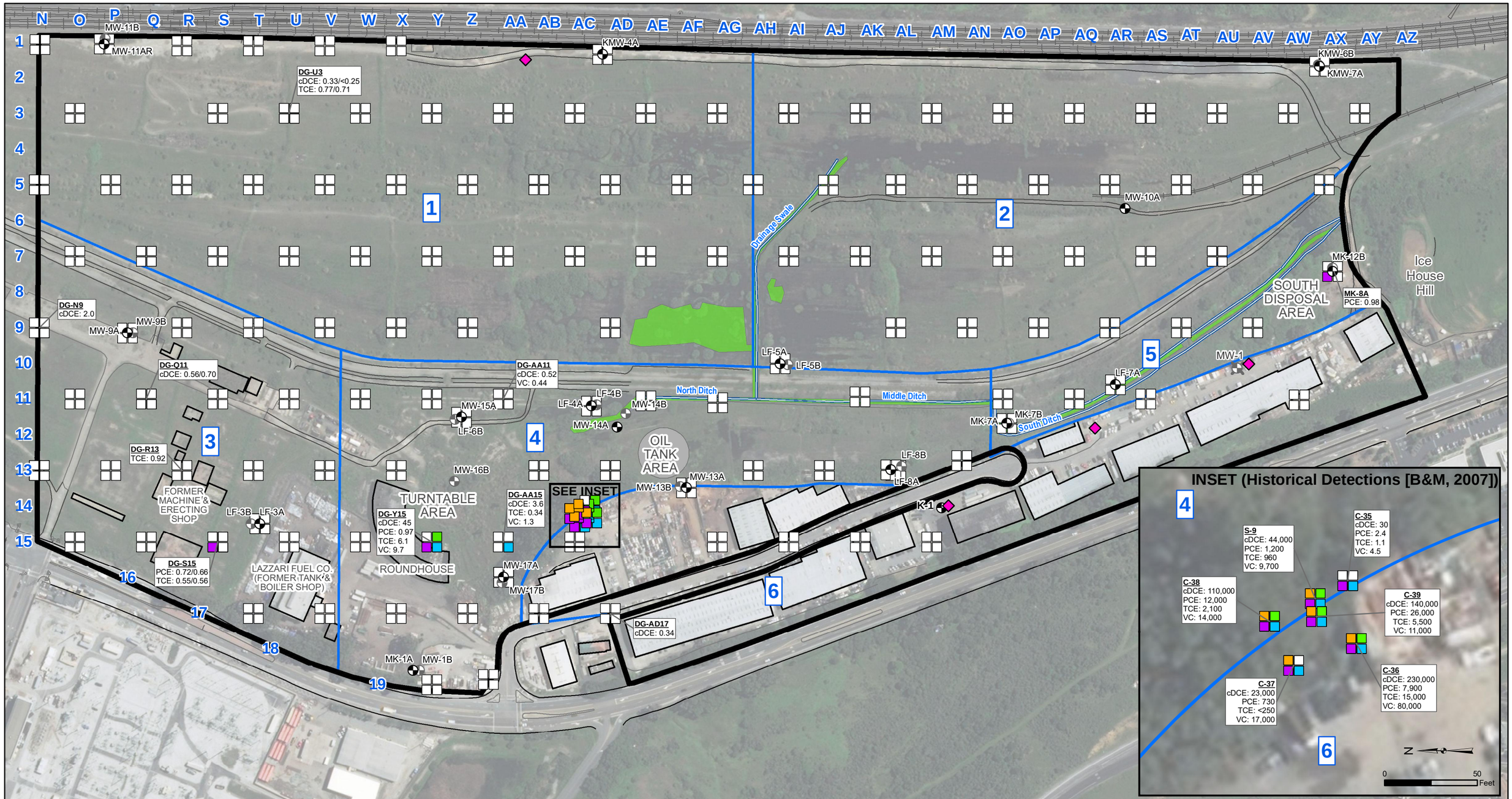
Brisbane Baylands OU-2
Brisbane, California

Geosyntec consultants

WG2556 | December 2021

Figure 16

D:\GIS\UPC\Brisbane\Project\2019_OU2_RAP\Fig16_BZ_EBZ_NAPH_XYL_GW.mxd 10/20/2020 2:41:41 PM



Legend

2019 Groundwater Sample Location
(only detections are labeled)

- Sample Location, Exceeds screening level for cDCE
- Sample Location, Exceeds screening level for PCE
- Sample Location, Exceeds screening level for TCE
- Sample Location, Exceeds screening level for VC

Chlorinated VOC concentrations are shown in Table 9.

- Fill-zone Groundwater Monitoring Well
- Groundwater Monitoring Well Not Screened in Fill-zone (not sampled during data gap investigation)
- Destroyed Groundwater Monitoring Well
- Former UST Location

- Drainage Ditch
- Wetlands (B&M, 2004)
- Approximate Former Oil Tank Location
- Site Boundary
- Sampling Zone
- Railroad Tracks
- Current/Former Building Footprint

Notes:
< = result is less than the method detection limit
-- / -- indicates original / duplicate result
µg/L = microgram per liter
VOC = Volatile Organic Compound
PCE = Tetrachloroethene
TCE = Trichloroethene
cDCE = cis-1,2-Dichloroethene
VC = Vinyl Chloride
PCE screening level in groundwater = 0.64 µg/L
TCE screening level in groundwater = 1.2 µg/L
cDCE screening level in groundwater = 49 µg/L
VC screening level in groundwater = 0.0086 µg/L,
but method detection limit = 0.20-0.25 µg/L
Results are reported in µg/L.
All locations are approximate.

N
0
260
Feet

Chlorinated VOC Concentrations in Fill Groundwater

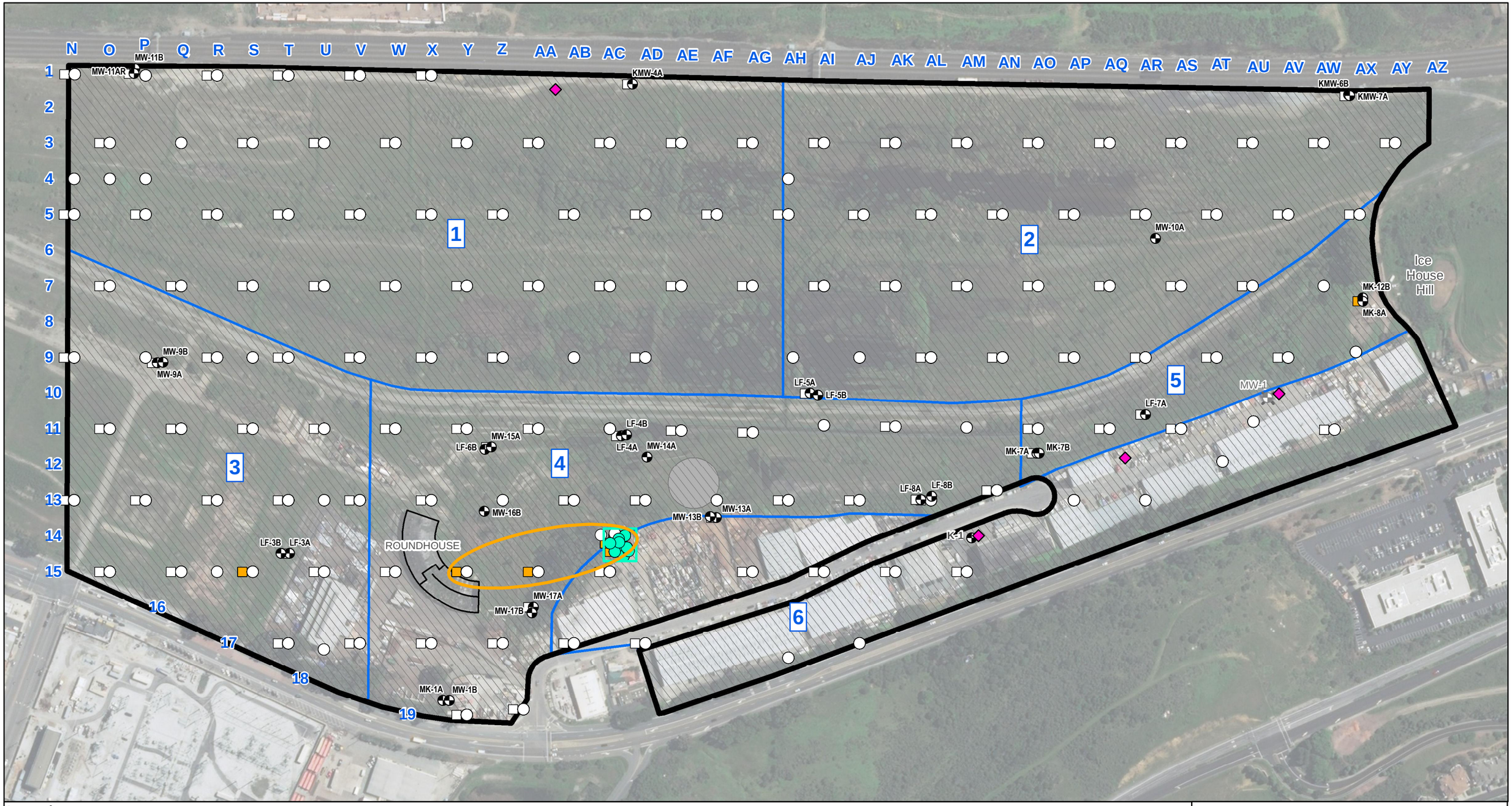
Brisbane Baylands OU-2
Brisbane, California

Geosyntec consultants

WG2556 | December 2021

Figure 17

D:\GIS\UPC\Brisbane\Project\2019_OU2_RAP\Fig17_PCE_TCE_cDCE_VC_GW.mxd 10/3/2020 7:45:52 AM



Legend

- Groundwater sample exceeds CUL for one or more CVOCs
- Soil sample exceeds CUL for one or more CVOCs
- Groundwater Sample Location Without CVOC CUL Exceedance
- Soil Sample Location Without CVOC CUL Exceedance
- Soil Excavation Area
- In Situ Groundwater Remediation Area
- Cap of Clean Soil or Hardscape (roads, building foundations, etc.)
- Groundwater Monitoring Well
- Former UST Location
- Approximate Former Oil Tank Location
- Site Boundary
- Sampling Zone
- Preserved Historical Building Footprint

Notes:
CUL = cleanup level
CVOC = chlorinated volatile organic compound
Existing buildings within the site boundary will be demolished excluding the former Roundhouse.
All locations are approximate.

N

0 260 Feet

Elements of Alternative 3

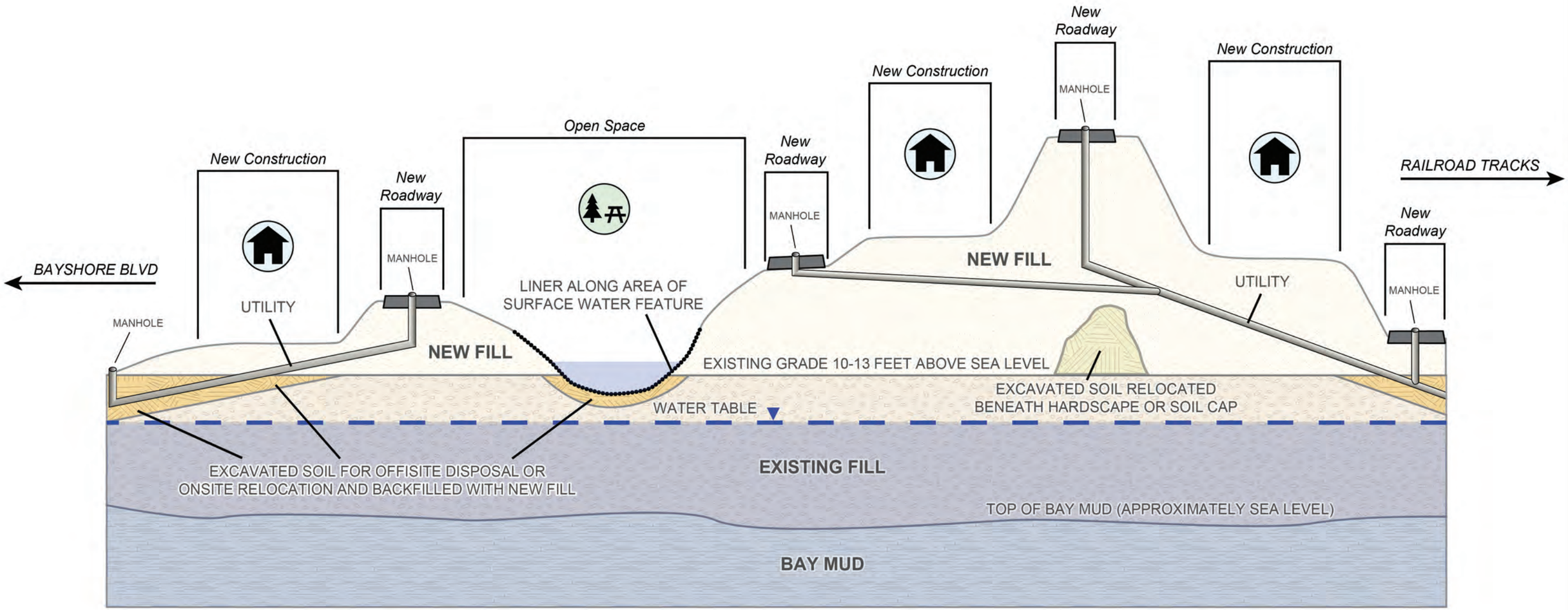
Brisbane Baylands OU-2
Brisbane, California

Geosyntec consultants

WG2556 | December 2021

Figure 18

D:\GIS\UPC\Brisbane\Project\2019_OU2_RAP\Fig18_Alternative_3.mxd 9/28/2020 4:27:32 PM



Not to Scale

Legend

Note:
Conceptual cross-section intended to illustrate elements of preferred remedy with generalized Site grading following redevelopment; final grade, site uses, and roadway and utility layout are not currently known.
Up to 30 feet of new fill will be added above the existing grade.

Conceptual Cross-Section of Redevelopment with Alternative 3

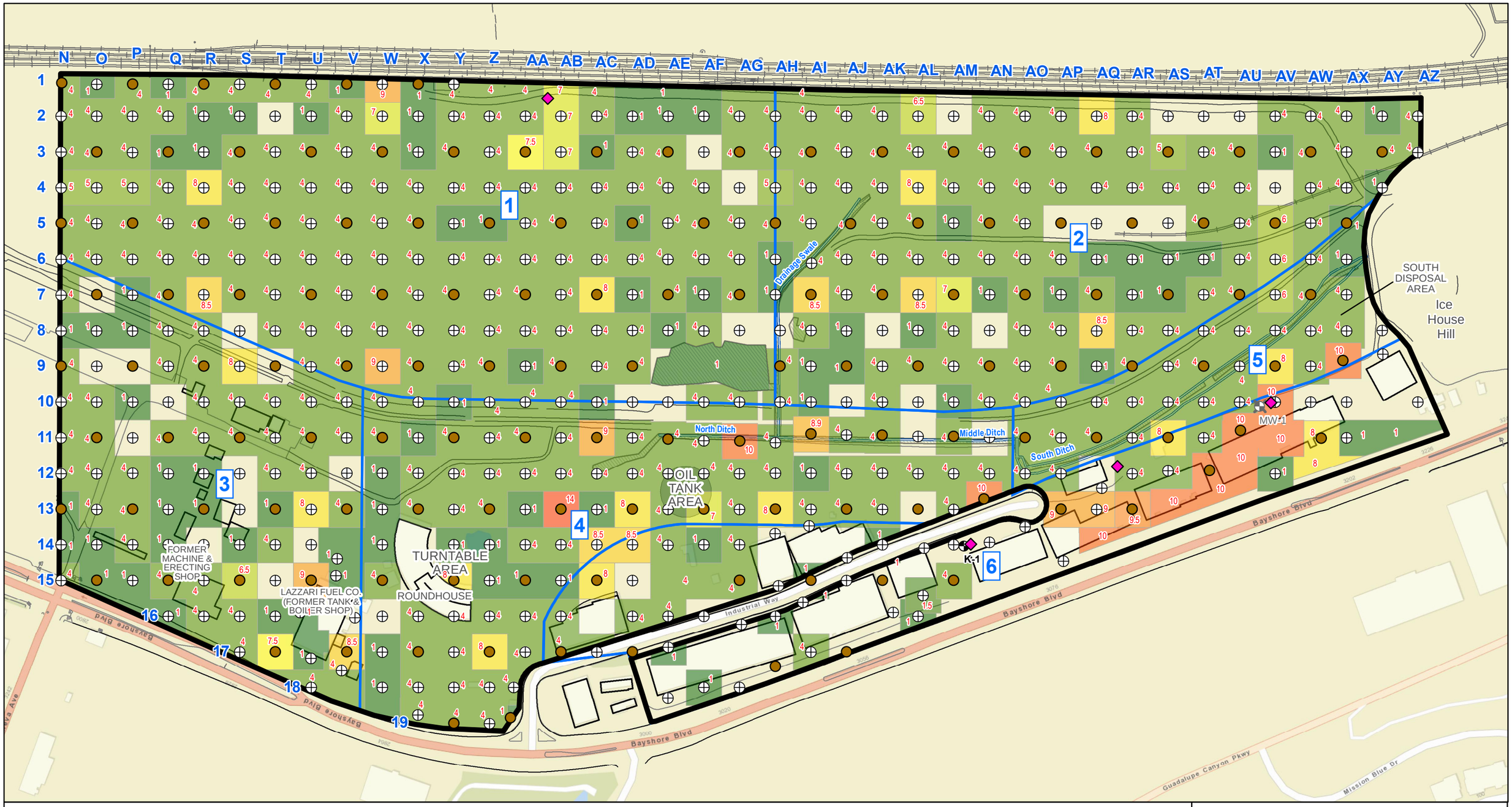
Brisbane Baylands OU-2
Brisbane, California

Geosyntec consultants

WG2556 | December 2021

Figure 19

P:\GIS\UPC\Brisbane\Project\2020_04\Fig19_Cut-Fill_Cross-Section.ai



Legend

Sample Location and Soil Analyses
- Metals
- Metals, VOCs, SVOCs, PCBs, OCPs, TPH, Asbestos
- Groundwater Monitoring Well
- Destroyed Groundwater Monitoring
- Former UST

Proposed Excavation Depth (ft bgs)

1	7.5
1.5	8
4	8.5
5	8.9
6	9
6.5	9.5
7	10
	14

4 - *Proposed Excavation Depth (ft bgs)*

- Drainage
- Sampling
- Wetlands (B&M,
- Approximate Former Oil Tank
- Site Boundary
- Railroad Tracks
- Current/Former Building Footprint

Notes:
ft bgs = feet below ground surface
OCPs = organochlorine pesticides
PCBs = polychlorinated biphenyls
TPH = total petroleum hydrocarbons
SVOCs = semivolatile organic compounds
VOCs = volatile organic compounds
All locations are approximate.

N

0 260 Feet

Soil Excavation Plan – Alternative 4

Brisbane Baylands OU-2
Brisbane, California

Geosyntec consultants

WG2556 | December 2021

Figure 20

D:\GIS\UPC\Brisbane\Project\2019_OU2_RAP\Fig20_ExcavationPlan.mxd 9/28/2020 4:26:22 PM

APPENDIX A
Information Submittal, Industrial Way Properties

14

INFORMATION SUBMITTAL
Industrial Way Properties
Brisbane, California

Kessler & Kessler
Alameda, California

9 June 1993
Project 1398.02

TREADWELL & ROLLO, INC.
Consulting Engineers and Scientists
San Francisco, California

TREADWELL & ROLLO, INC.
Consulting Engineers and Scientists
353 Sacramento Street, Suite 800
San Francisco, California 94111
(415) 955-9040

SAN MATEO COUNTY
ENVIRONMENTAL HEALTH
JUN 11 1993
RECEIVED

9 June 1993
Project 1398.02

14

Ms. Barbara J. Cook, P.E., Chief
Site Mitigation Branch
State of California Environmental Protection Agency
Department of Toxic Substances Control, Region 2
700 Heinz Avenue, Suite 200
Berkeley, California 94710-2737

Subject: Information Submittal
Industrial Way Properties
Brisbane, California

Dear Ms. Cook:

In response to your request of 29 January 1993, Treadwell & Rollo, Inc. submits the enclosed information on behalf of our client, Kessler & Kessler. This submittal complies with your 29 January letter as completely and accurately as possible with the available information.

The information included herein was compiled from a variety of sources, such as regulatory agency files, Kessler & Kessler files, Treadwell & Rollo site files, historical chain-of-title documents, aerial photographs, site visits and tenant interviews. We have attempted to address each item identified in your request; however, because of the length of time since the initial development of the Industrial Way properties, and the diverse nature of tenant operations, other historical information and documentation regarding site operations may exist. Accordingly, we will provide you with additional pertinent information, if any, when it becomes available.

We trust the enclosed submittal satisfies your request for information. If you have any questions, please call Sharon Eckard or either of the undersigned at the number above.

Sincerely yours,
TREADWELL & ROLLO, INC.

Philip T. Tringale, Ph.D., P.E.
Associate Engineer

Donald D. Treadwell, Ph.D., P.E..
Principal Engineer

PTT:DDT:gmc
13980211.SPE

Enclosure

cc: Leslie M. Kessler, Esq.
Rex Scatena, Esq.
Diane Mims, RWQCB
Elizabeth Rouan, SMCDEH

TABLE OF CONTENTS

1.0	INTRODUCTION	1
2.0	SCOPE OF WORK	1
3.0	CHEMICAL USE HISTORY REPORT	2
	3.1 History of Site Ownership	2
	3.2 History of Tenants	3
	3.3 Facility Information and As-built Drawings	3
	3.3.1 Historical Aerial Photograph Review	4
	3.3.2 Sanborn Map Review	4
	3.3.3 As-Built and Utility Drawings	5
	3.3.4 Summary of Site Reconnaissance and Regulatory Agency File Review	5
4.0	HISTORY OF ON-SITE CHEMICAL USE	23
5.0	SUMMARY OF PREVIOUS ON-SITE INVESTIGATIONS	24
	5.1 Soil Quality Assessment	24
	5.2 Groundwater Investigations	25
	5.3 Underground Storage Tank Investigations	25
6.0	SUMMARY OF OFF-SITE INVESTIGATIONS	25
7.0	SUMMARY OF INSURANCE INFORMATION	26

FIGURES

TABLES

APPENDICES

LIST OF FIGURES

Figure	
1	Site Location Map
2	Site Plan
3	Transfer of Ownership Map - 1929
4	Map of Current Tenants
5	Historical Aerial Photograph - 1935
6	Historical Aerial Photograph - 1948
7	Historical Aerial Photograph - 20 June 1961
8	Historical Aerial Photograph - 10 May 1972
9	Historical Aerial Photograph - 2 July 1991
10	Wilsey & Ham, Brisbane Industrial District, Revised Tentative Map, June 1968
11	Map of Former Underground Storage Tank Locations and Current Chemical Storage Areas
12	Map of Sampling Locations
13	Total Petroleum Hydrocarbons as Bunker C or Waste Oil in Soil (1 to 7 feet)
14	Total Petroleum Hydrocarbons as Bunker C or Waste Oil in Soil (8 to 12 feet)
15	Total Petroleum Hydrocarbons as Diesel in Soil (2 to 6.5 feet)
16	Total Petroleum Hydrocarbons as Diesel in Soil (7 to 14 feet)
17	Lead in Soil (0 to 7 feet)
18	Lead in Soil (7.5 to 16 feet)
19	Copper in Soil (0 to 16 feet)
20	Copper in Soil (7 to 16 feet)
21	Chromium in Soil (0 to 9 feet)

LIST OF TABLES

Table No.	
1	Summary of Recorded Ownership Documents
2	Summary of Current Tenants
3	Summary of Previous Tenants
4	Summary of Historical Aerial Photographs
5	List of Personal Contacts
6	Summary of Underground Storage Tank Removal
7	List of Chemicals Used On Site
8	References - Bayshore Railyard Investigations
9	Summary of Insurance

LIST OF APPENDICES

A	VISTA Certification Letter - 28 February 1993
B	Underground Storage Tank Removal Reports: o 250 Industrial Way o 285 Industrial Way o 350 Industrial Way
C	Characteristics of Chemicals Used On Site
D	Treadwell & Rollo, Inc., 15 October 1992 Soil Quality Assessment
E	Treadwell & Rollo, Inc., 24 February 1993 Groundwater Monitoring Results Monitoring Wells K-1 and MW-1

INFORMATION SUBMITTAL
INDUSTRIAL WAY PROPERTIES
Brisbane, California

1.0 INTRODUCTION

Treadwell & Rollo, Inc. prepared this information submittal in response to the State of California Department of Toxic Substances Control (DTSC) 29 January 1993 request for information pertaining to the Industrial Way properties (the site) in Brisbane, California, as shown in Figure 1. In their 29 January 1993 letter, the DTSC requested information on site activities pertaining to current and historical uses, current and historical ownership, chemical use history, and any information regarding the subsurface conditions of the site, including soil and groundwater analytical results.

This information submittal was prepared on behalf of Kessler & Kessler, representatives of the current owners, Leslie M. Kessler, Albert H. Kessler, Edward S. Ageno, and Kay Enterprises, a partnership (consisting of Randall E., Gary A., Donald B., and Leland E. Kessler), (the Kesslers) of properties at 21 through 27, and 55 through 400 Industrial Way in Brisbane, California. A site plan is presented in Figure 2. The properties at 10, 11, 36, and 40 Industrial Way are not owned by the Kesslers.

2.0 SCOPE OF WORK

To prepare this submittal, Treadwell & Rollo performed the following tasks:

- reviewed file material provided by the DTSC in their 29 January 1993 information request
- reviewed regulatory and local agency files at the California Regional Water Quality Control Board (RWQCB), San Mateo County Department of Environmental Health (SMCDEH), City of Brisbane Planning Department (CBPD), and the City of Brisbane Fire Department (CBFD)
- reviewed historical aerial photographs of the site and vicinity
- compiled available information from Treadwell & Rollo files

- prepared maps illustrating the location of known chemical storage and use areas, including the locations of former underground fuel storage tanks
- compiled available information regarding the physical state and characteristics of chemicals known to have been historically or currently used on site
- conducted site visits and interviews with tenants that were known to use or store chemicals during their course of business.

In addition, Kessler & Kessler conducted a review of their files regarding the history of tenants since their ownership began in 1977, and conducted tenant interviews regarding on-site operations and chemical use.

3.0 CHEMICAL USE HISTORY REPORT

The results of this investigation are presented below. Some information specifically requested by the DTSC is not readily available due to the lack of historical documentation and is so noted.

3.1 History of Site Ownership

The site is currently owned by the Kesslers. The site was purchased in September 1977 by Albert H. Kessler, Leslie M. Kessler, Edward S. Ageno, and Statewide Security Company from R.G., S.D., and J.P. Tuck, and J.T. and P. Stanley, the property developers. The site was developed into the Brisbane Industrial Park in the early 1960s during the time the Tucks and Stanleys owned the property. Subsequent to the 1977 purchase, Statewide Security Company was dissolved and the property distributed to the stockholders, Randall E., Gary A., Donald B., and Leland E. Kessler.

Kessler & Kessler performed a chain-of-title search for the site through First American Title Company the search dated back to 1895. A summary of the title report information is presented in Table 1. A copy of the chain-of-title report was previously provided to the DTSC by Kessler & Kessler under separate cover. As indicated on the

title report, there are numerous conveyances of the site property between individuals, Partridge Realty Company, and three industrial interests: Pacific Bone, Coal and Fertilizing Company, Southern Pacific Railroad Co. (also Southern Pacific Co.), and Consolidated Chemical Industries, Inc. (also Stauffer Chemical Co.). We understand Stauffer Chemical Co. has been acquired by Rhone-Poulenc.

Kessler & Kessler provided the DTSC with historical maps illustrating the areas of the site once owned by Southern Pacific Company and Pacific Bone, Coal, & Fertilizing Company. A copy of one of these maps showing the property parcels transferred from Southern Pacific to Pacific, Bone, Coal, and Fertilizing Company in 1929 is presented in Figure 3. We understand from the turn of the century until approximately 1962, a hide and glue plant operated in the northern portion of the site. During this time, the hide and glue plant was owned successively by Pacific Bone, Coal, and Fertilizing Company, Consolidated Chemical Industries, Inc., and Stauffer Chemical Co. We have no documentation as to the use of the property by Southern Pacific.

3.2 History of Tenants

The site is currently used in a light industrial, warehousing, and distribution capacity. A summary of the current tenants and their dates of tenancy is presented on Table 2 and Figure 4.

A summary of available information regarding previous tenants from Kessler & Kessler's files dating to 1977 is presented on Table 3. Information on tenancy earlier than 1977 is not available.

3.3 Facility Information and As-built Drawings

To evaluate the use of chemicals on site and to obtain historical facility information, Treadwell & Rollo conducted a review of historical aerial photographs, requested a review of Sanborn Maps (fire insurance maps), reviewed pertinent regulatory agency

files, and conducted a site reconnaissance and tenant interviews. The results of these tasks are discussed below.

3.3.1 Historical Aerial Photograph Review

Treadwell & Rollo reviewed fourteen aerial photographs of the site spanning the time period from 1935 through 1991. A list of the aerial photographs including reference numbers and photograph dates is presented on Table 4. Copies of 1935, 1948, 1961, 1972, and 1991 aerial photographs depicting changes in property development are presented in Figures 5 through 9. The aerial photographs were obtained from Pacific Aerial Surveys in Oakland, California.

In their 29 January 1993 letter, the DTSC specifically requested copies of aerial photographs of the site dating from 1943 and 1957. We understand the DTSC is interested in this time period due to a reference in DTSC files regarding the presence of three on-site ponds. The reference was contained in a handwritten interpretation of 1943 and 1957 aerial photographs allegedly depicting the site. Apparently, the photographs are not included in the DTSC files. Treadwell & Rollo contacted several sources of aerial photographs in the Bay Area, including Pacific Aerial Surveys in Oakland, the United States Geological Survey in Menlo Park, Towill, Inc. in San Francisco, and American Aerial and Geonics in Sacramento. Photographs from 1943 and 1957 were unavailable from these sources.

We have included a photograph from 1948, which is within the time period the DTSC specified. There are no features in the 1948 aerial photograph that indicate the presence of ponds.

3.3.2 Sanborn Map Review

Treadwell & Rollo requested a Sanborn Map review of the site for historical ownership, tenant, chemical usage and utility information through VISTA Environmental

Information, Inc. The Sanborn Map Co. certifies there is no fire insurance map coverage for the site. VISTA's confirmation letter is presented in Appendix A.

3.3.3 As-Built and Utility Drawings

To obtain information regarding as-built and utility drawings, Treadwell & Rollo reviewed the available files at the City of Brisbane Planning Department (CBPD) and contacted Wilsey & Ham of San Mateo, California, the civil engineering contractor for development of the site in the 1960s. Wilsey & Ham indicated they did not keep files dating back to that time period. One drawing dated June 1968 was found at the CBPD. A reproduction of the drawing is presented in Figure 10.

This map illustrates the configuration of the existing buildings and concrete pads in 1968, the location of utilities such as the brick-arch combined sewer, power and gas lines, and storm drains. An existing above-ground concrete tank is present on the map in the vicinity of the current building at 151 Industrial Way. Usage of this tank is unknown. No other utility or as-built drawings were found during our search.

3.3.4 Summary of Site Reconnaissance and Regulatory Agency File Review

To obtain information regarding current and historical facility uses, Treadwell & Rollo reviewed files concerning the Industrial Way properties at the State of California Regional Water Quality Control Board (RWQCB), the San Mateo County Department of Environmental Health (SMCDEH), the City of Brisbane Planning Department (CBPD) and the City of Brisbane Fire Department (CBFD). In addition, we reviewed the information from DTSC files provided by the DTSC in their 29 January 1993 information request, and conducted site reconnaissance surveys and tenant interviews of the premises of those businesses which store or use chemicals on site. Treadwell & Rollo performed the reconnaissance survey and tenant interviews on 18 March 1993. The results of the agency file reviews and site reconnaissance surveys are presented below.

The agency files for the site indicated:

- underground storage tanks (USTs) were formerly located at 250, 285, and 350 Industrial Way
- documented chemical storage and use at 25, 55, 60, 80, 180, 304, 285, and 374 Industrial Way
- documented waste oil generation/temporary storage at 21, 171, 304, 366, and 374 Industrial Way
- documented generators of greater than 1,000 kilograms of hazardous substances stored or generated on a monthly basis at 23 and 180 Industrial Way.

The agency files concerning properties adjacent to the site along Industrial Way indicated:

- the presence of an above-ground 500-gallon gasoline tank and Occupational Safety and Health Administration (OSHA) violations at 11 Industrial Way
- the removal of a UST believed to contain diesel fuel from under the driveway at 36 Industrial Way in 1991, and replacement with an above-ground diesel tank.

The locations of former USTs and current chemical storage on the site are presented in Figure 11. The current use, storage, and disposal of chemicals and the generation of hazardous wastes at each address where chemicals are used is discussed below. This information is based on agency file reviews, tenant interviews, and site visits. A list of the personal contacts interviewed by Treadwell & Rollo is presented on Table 5.

21 Industrial Way

Current tenant: PSG Management

The space at 21 Industrial Way comprises a warehouse and office space. Agency file information indicates a spray booth was operated on site and a "gravity-fed", above-ground tank is located behind the warehouse for waste oil storage. Treadwell & Rollo did not observe a spray booth on site at the time of the site visit.

Wastes generated at this facility are limited to oil generated during vehicle maintenance. Wastes are stored in three 55-gallon drums located next to the front garage door. The covered drums are placed on the concrete flooring and are equipped with funnels to transfer the waste oil into the drums. We assume this system is what was referred to as the "gravity-fed system" in agency files. The waste oil is reportedly removed by a recycler every 90 days. New oil is stored on site on shelving.

We did not observe improper use, storage, or disposal of hazardous materials or wastes during the site visit. Regulatory agency files have no records of spills, leaks, or violations for operations conducted at this address. Available historical information indicates this unit was used for auto body and detailing operations from at least 1977.

23 Industrial Way

Current tenant: Tiger's Auto Body

The space at 23 Industrial Way consists of a workspace/warehouse area with two booths: one spray booth and one vented, fireproof, welded paint storage booth. Concrete flooring is present in this space. Site operations consist of auto body work. Engine maintenance is not conducted at this facility. Hazardous materials used during site operations include paints and paint thinners. The paint and thinner products are stored on shelves in the storage booth described above. Hazardous wastes include waste paint and thinners stored in two 55-gallon drums inside the storage booth. The wastes are reportedly removed by Romie Disposal every 90 days.

Available regulatory agency file information on 23 Industrial Way indicates conflicting evidence of the status of a previous tenant, Hernandez Automotive. Hernandez Automotive operated at 23 Industrial Way from approximately 1983 through 1988. CBFD files indicate this business is a major generator of hazardous substances, generating more than 1,000 kilograms of hazardous substances on a monthly basis; however, SMCDEH files indicate Hernandez Automotive generated less than one ton

(1,016 kilograms) of waste per year.

We did not observe improper use, storage, or disposal of hazardous materials or wastes during the site visit. Regulatory agency files have no records of spills, leaks, or violations for operations conducted at this address. Available historical information indicates similar operations have been conducted here since before 1977.

25 Industrial Way

Current tenant: Gonzalez Roofing

The current tenant operates a roofing company. Engine maintenance is not performed on site. Hazardous materials used in site operations are limited to approximately 30 to 60 gallons of gasoline in two mobile drums and nine cylinders of propane. The gasoline is used to fill their engine tanks. Hazardous wastes are not generated from site operations.

The CBFD files indicate small amounts of paint, thinners, and solvents are appropriately stored inside this unit in a flammables storage cabinet. We did not observe these materials or storage cabinet during our site reconnaissance.

We did not observe improper use, storage, or disposal of hazardous materials or wastes during the site visit. Regulatory agency files have no records of spills, leaks, or violations for operations conducted at this address.

Available historical information indicates this unit was previously occupied by a metal fabrication and distribution business.

27 Industrial Way

Current tenant: Bayporter Express

The facility at 27 Industrial Way comprises warehouse space, an auto maintenance area,

small office, and storage room. Hazardous materials used at this facility include oil, transmission fluid, and other automotive products. The oil and transmission fluid are stored inside on concrete flooring in 240-gallon and 85-gallon rectangular containers, respectively. General auto cleaning products are stored in the back storage room on shelves. Hazardous wastes generated from site operations include used batteries, approximately four 55-gallon drums of waste oil every 2 to 3 months, approximately one 55-gallon drum of waste oil filters every three months, and approximately one 55-gallon drum of antifreeze every year. In addition, waste brake cleaner/machine solvent is generated at the site. The brake cleaner and solvent wastes are discharged into a Safety-Kleen wash basin and drum system that is reportedly replaced every two months by Safety-Kleen. The batteries and waste oil are recycled periodically.

The CBPD files indicate that Nickell Precision Manufacturing, a light sheet metal fabrication business, applied for a business license at this address in 1979 and 1987. We believe the CBFD files are in error, as the Kesslers have no information regarding Nickell Precision Manufacturing. According to the Kesslers, Nickell Precision Manufacturing never occupied these premises as a tenant or a lessee.

We did not observe improper use, storage, or disposal of hazardous materials or wastes during the site visit. Regulatory agency files have no records of spills, leaks, or violations for operations conducted at this address.

Available historical information indicates this unit was previously used for sheet metal product assembly and distribution. According to Mr. David Sutton, the owner of the former tenant, Mil-Spec, only small quantities (five gallons) of lacquer thinner were used at the facility. Scrap metal (stainless steel and aluminum) were picked up by recyclers.

55 Industrial Way

The building at 55 Industrial Way is currently vacant and is commonly referred to as the Moore Building. The CBPD files indicate that Stauffer Chemical formerly owned this property, but the dates of ownership were not available. The Moore Manufacturing Company operated at this address from the mid-1960s to November 1986. The Moore Manufacturing Company manufactured plastic hoses.

CBFD file information indicates the Moore Manufacturing Company produced and stored plastic materials on site. There was no indication of a spill or accidental release of chemicals from this facility in the file. The CBFD file also contained a Material Safety Data Sheet (MSDS) for a homopolymer resin which was used on site, which indicated it to be a low hazard material.

During 1977, 55 Industrial Way was subdivided into 55A and 55 Industrial Way. After the Moore Co. vacated the premises, 55 Industrial Way was leased to T.C. Transportation, Inc. (Thomas Cala) and 55A leased to Hornung Trucking. In addition, Guam Cargo Consolidators, Inc., Guest Transportation Systems, and Amer/Indo International were sub-tenants to T.C. Transportation. We understand they utilized only office space.

The CBFD files indicate that in July 1989, waste oil had been dumped into a rainwater tank adjacent to the front steps of the building at 55 Industrial Way. The owners hired a contractor to investigate and the contractor concluded the volume of waste oil was negligible. The tank contents were subsequently pumped out and removed. No other violations or indications of spills or releases of chemicals were noted in the files for operations conducted at this address.

60 Industrial Way

Current tenant: Friendship Printing

The space at 60 Industrial Way is occupied by several rooms of offices, warehouse space, and workspace. The floor is concrete. Each month, Friendship Printing generates approximately 1.5 gallons of photochemical wastes including solvents, residual inks, and fixer and approximately nine gallons of ink waste. The solvent wastes are disposed of into a Safety-Kleen solvent wash basin and storage drum system, and periodically removed from the site by Safety-Kleen. The residual inks and fixer wastes are temporarily stored in a covered 55-gallon drum and later recycled.

We did not observe improper use, storage, or disposal of hazardous materials or wastes during the site visit. Regulatory agency files have no records of spills, leaks, or violations for operations conducted at this address.

CBPD files include a February 1992 business license application for Anpra, Inc., Botanical Research & Consulting at this address. The Kesslers indicate Anpra, Inc. was never a tenant of these premises, and they have no information regarding Anpra, Inc. Available historical information indicates former tenants included first aid equipment sales company and a fluorescent lighting fixture manufacturer.

80 Industrial Way

Current tenant: Vacant

The available information for this site in CBFD files indicated that in January 1988, five drums of non-hazardous fluorescent light fixture cleaner labeled "Synthetic Surfactants" were present on site. CBPD files include a business license application for Maximum Technology Sales & Service at this address. Maximum Technology Sales & Service operated under Maximum Technology, Inc. Maximum Technology, Inc. operated at 80 Industrial Way from September 1983 to about May 1991. There is no additional information regarding historical tenancy.

100 Industrial Way

Current tenant: Acme Scenery

Acme Scenery builds and paints wooden and metal stage sets. Acme Scenery uses latex and water-based paints for the majority of their work. Hazardous materials used on site are limited to paints and small quantities (1-2 gallons) of acetone/paint thinner. Hazardous waste is not generated at this facility. Leftover paint is mixed and used for other jobs. Acme Scenery also stores stage sets at 312 and 370 Industrial Way. No pertinent information for this address was available in agency files.

We did not observe improper use, storage, or disposal of hazardous materials or wastes during the site visit. Regulatory agency files have no records of spills, leaks, or violations for operations conducted at this address. Available historical information indicates former tenants have included a food and furniture importer.

151 Industrial Way

Current tenant: Tri-R-Steel

Tri-R-Steel constructs steel products such as boxes, conveyors, and sinks. Hazardous materials are not used or generated in site operations. We did not observe improper use, storage, or disposal of hazardous materials or wastes during the site visit. Regulatory agency files have no records of spills, leaks, or violations for operations conducted at this address. Available historical information indicates former tenants have included a food and furniture importer.

161 Industrial Way

Current tenant: R&H Repair

The current tenant operates an appliance, small machine and engine repair shop, repairing items such as vacuum cleaners, floor polishers, jigsaws, and lawn mowers. Hazardous materials observed at the time of the site visit were limited to one can of WD-40 lubricating oil. Reportedly, no hazardous wastes are generated during site

operations.

We did not observe improper use, storage, or disposal of hazardous materials or wastes during the site visit. Regulatory agency files have no record of spills, leaks, or violations for operations conducted at this address. Available historical information indicates similar operations have been conducted here since prior to 1977.

171 Industrial Way

Current tenant: Advanced Carbon Products

Advanced Carbon Products manufactures carbon and graphite products for machines and computers. Based on information obtained during the site visit, Advanced Carbon previously conducted vehicle maintenance on site, but has discontinued this practice. SMCDEH files indicate approximately 30 to 40 gallons per year of waste oil were generated at this facility as recently as July 1992. The waste oil was apparently recycled.

Hazardous material use on site is currently limited to use of an adhesive at a rate of approximately one quart per year. The adhesive is stored in an on-site refrigerator. Reportedly, hazardous wastes are not generated during site operations.

We did not observe improper use, storage, or disposal of hazardous materials or wastes during the site visit. Regulatory agency files have no record of spills, leaks, or violations for operations conducted at this address. No information is available regarding previous tenants in this space.

180 Industrial Way

Current tenant: Hueline, Inc.

Hueline, Inc., a textile dyeing business, has operated at the site since 1987. Hazardous materials observed at the time of the site reconnaissance include hydrogen peroxide, acetic acid, bleach, sodium hydroxide, and sodium hydrosulfite. These chemicals are

stored in 55-gallon drums contained in plastic basins. The basins are contained within welded steel bins elevated from the concrete floor. Reportedly, hazardous wastes are not stored on site. Wastes are limited to liquid wastes that are reportedly discharged to the storm water sewer under permit. Hueline, Inc. has two industrial wastewater permits, a five-year wastewater discharge permit (No. 1-1165) from the Bayshore Sanitary District issued 9 January 1992, and a four-year Class I permit (No. 16-11-49) from the City and County of San Francisco Department of Public Works which expires 19 June 1995. The water is analyzed quarterly for metals, pH, and other parameters.

SMCDEH records included wastewater analysis results of dye plant effluent originating from this operation. The analytical results are dated September 1990. They indicated the presence of 192 parts per billion (ppb) copper, 119 ppb zinc, 38 parts per million (ppm) Biological Oxygen Demand (BOD), 280 ppm Chemical Oxygen Demand (COD), 0.02 ppm total cyanides, 0.14 ppm total phenols, <2.0 ppm sulfide, 110 ppm total suspended solids, and a pH of 9.68. There is no indication in the regulatory agency files that these concentrations exceed the permit limits. According to Mr. Craig Magline of Hueline, Inc., the effluent concentrations have never exceeded their permit limits.

A 1988 CBFD safety report lists the following chemicals being used at this address: Sani-Fresh Waterless Cleaner containing dipentene, triethanolamine sodium, hydrosulfite, sodium formaldehydesulfoxylate, sodium hexametaphosphate, and dyes. According to CBFD records, no hazardous waste is generated during these operations.

We did not observe improper use, storage, or disposal of hazardous materials or wastes during the site visit. Regulatory agency files have no record of spills, leaks, or violations for operations conducted at this address. Available historical information indicates similar operations have been conducted at the facility since before 1977.

190 Industrial Way

Current tenant: Hung Cheung Rattan

Hung Cheung Rattan operates a dry goods shipping and receiving business at this address. Reportedly, no hazardous materials are used during site operations. Hazardous wastes on site are limited to three, half-full five-gallon cans of paint thinner left over from a previous painting job. Painting is reportedly no longer performed on the premises.

We did not observe improper use, storage, or disposal of hazardous materials or wastes during the site visit. Regulatory agency files have no record of spills, leaks, or violations for operations conducted at this address. Available historical information indicates previous tenants included a zipper sales and distribution company, a delivery service, and the same textile dyeing business which operated at 180 Industrial Way.

200 Industrial Way

Current tenant: MF Bank Restoration Co.

MF Bank Restoration Co. operates a cleaning company that generally contracts with insurance companies to perform industrial cleaning at off-site locations after accidents/disasters. Hazardous materials include numerous cleaning supplies and maintenance products which are stored within a concrete-lined, bermed area. MSDSs are available for the products stored on site. These products include, but are not limited to the following: 1- to 3-gallon containers of solvent, gasoline, wood stains, turpentine, carpet cleaners stored in a locked cabinet; isopropyl alcohol, rust and scale remover, LPS3 lubricating anti-rust agent, non-petroleum based degreaser in drums within the secondary containment area described above; and various cleaning products stored on shelves. Hazardous wastes are not generated on site. Fourteen open drums were observed behind the building at the time of the site visit. They appeared to be partially filled with rainwater.

We did not observe improper use, storage, or disposal of hazardous materials or wastes during the site visit. Regulatory agency files have no record of spills, leaks, or violations for operations conducted at this address. Available historical information indicates former tenants have included a scaffolding company, a printing press, and the textile dyeing company which operated at 180 and 190 Industrial Way.

250 Industrial Way

Current tenant: Granny Goose

Granny Goose operates a dry goods warehouse at this facility. Reportedly, hazardous materials are not used and hazardous wastes are not generated during site operations. Automotive work is not conducted on the premises. We did not observe improper use, storage, or disposal of hazardous materials or wastes during the site visit.

A gasoline UST was removed from this property in April 1988. The tank had been originally installed in the 1970s prior to the Kesslers' purchase of the property in September 1977. The party originally responsible for tank installation is unknown. A groundwater monitoring well, originally identified as well W-1, later designated well K-1, was installed at this location. The available information regarding the tank excavation and well installation is presented in Appendix B. Other than the information concerning the former UST, regulatory agency files have no records of spills, leaks, or violations for operations conducted at this address.

Available historical information indicates former tenants included a moving and storage company and a paper and grocery business.

285 Industrial Way

Current tenant: C&J Forklift

C&J Forklift stores and repairs forklifts on the property. Hazardous materials used in site operations are oil, transmission fluid, hydraulic fluid, and solvents. These materials

are stored in 55-gallon drums inside the building on pallets above a concrete floor. The drums are sealed and are equipped with pumps to dispense the product. Hazardous wastes generated from site operations are waste oil and solvents; these wastes are recycled. The waste oil is stored in a 55-gallon drum which is contained within a separate drum behind the main building on a concrete pad. This area is also covered with an awning. Four empty waste oil drums are stored next to the waste oil drum on site. Waste solvents are discharged into a Safety-Kleen wash basin and drum system which is replaced once a month by Safety-Kleen. We did not observe improper use, storage, or disposal of hazardous materials or wastes at this site during the site visit.

A gasoline UST was removed from this property in March 1991. The tank had been originally installed prior to the Kesslers' purchase of the property in September 1977. The party originally responsible for tank installation is unknown. The available information regarding the tank excavation is presented in Appendix B.

Other than the information concerning the former UST, regulatory agency files have no records of spills, leaks, or violations for operations conducted at this address. There is no available information regarding previous tenants at this facility.

290 Industrial Way

Current tenant: Sound on Stage

Sound on Stage operates a storage facility for electronic sound equipment. Hazardous materials used on site are limited to small amounts of adhesives and thinners which are stored in a locked cabinet. Hazardous wastes are not generated as a result of site operations.

We did not observe improper use, storage, or disposal of hazardous materials or wastes during the site visit. Regulatory agency files have no records of spills, leaks, or violations for operations conducted at this address.

294 Industrial Way

Current tenant: Circle Bay Trucking

Circle Bay Trucking operates a light trucking business. At the time of the site visit, this facility was locked and Treadwell & Rollo could not gain access to the space. We understand vehicle maintenance is not performed on site and chemical use is limited to a one-gallon container of paint thinner which is stored in a metal cabinet.

Regulatory agency files have no records of any spills, leaks, or violations for operations conducted at this address. Available historical information indicates this space was used for storing office partition walls from 1976 to 1989.

296 Industrial Way

Current tenant: Maximum Technology

The site is currently subleased to Young's Generator. Young's Generator stores mobile generator rental units for bands and parties. Hazardous materials were limited to a propane tank and fresh quarts of oil stored on shelves. Hazardous wastes are limited to waste oil generated on site from changing the oil in the generators. Waste oil is kept in a 30-gallon drum on site and recycled periodically. The drum was empty at the time of the site visit. Oily rags are stored in a covered trash can and disposed of by a linen service contractor.

We did not observe improper use, storage, or disposal of hazardous materials or wastes during the site visit. Regulatory agency files have no records of spills, leaks, or violations for operations conducted at this address. Available historical information indicates that former tenants included Mother's Cookies (which now occupies 400 Industrial Way) and a commercial scenery and stage set company.

304 Industrial Way

Current tenant: Simonds Machinery

Simonds Machinery Co. is a pump distributor which sells and services pumps. Hazardous materials used during site operations are oil and solvents which are stored in closed 55-gallon drums on the concrete floor, and acetylene gas, argon gas, and spray paints which are stored in cabinets. Hazardous wastes include waste solvents that are discharged into a Safety-Kleen wash basin and drum system; the system is serviced every 60 days by Safety-Kleen.

According to SMCDEH files, Simonds Machinery Co. generates approximately five gallons of waste oil per month, and approximately one gallon of waste solvents per month. The wastes are recycled by Safety-Kleen. The CBFD files contain a reference to the presence of one 55-gallon drum of solvent on site at the time. We did not observe this drum during our site visit.

We did not observe improper use, storage, or disposal of hazardous materials or wastes during the site visit. Regulatory agency files have no records of spills, leaks, or violations for operations conducted at this address. Available historical information indicates Simonds Machinery has operated at this facility since 1973.

308 Industrial Way

Current tenant: R&S Erection

R&S Erection stores small quantities of WD-40, hydraulic fluid for an on-site forklift, and paint thinner. Hazardous wastes are not generated from site operations.

Evidence of improper use, storage, or disposal of hazardous materials or wastes was not identified during the site visit. Regulatory agency files have no records of spills, leaks, or violations for operations conducted at this address. Available historical information indicates former tenants included a wine and beer importer.

340 Industrial Way

Current tenant: Li Chung Sang Enterprises

Li Chung Sang Enterprises operates a dry goods storage facility at this location. Some furniture painting is performed on site using water-based paints. In addition, minor automotive maintenance such as oil changes is performed on site. Reportedly, the waste motor oil is discharged into old paint cans, sealed, and disposed of off site. Hazardous wastes are not generated from site operations.

We did not observe improper use, storage, or disposal of hazardous materials or wastes during the site visit. Regulatory agency files have no records of spills, leaks, or violations for operations conducted at this address. Available historical information indicates that former tenants included a gift import and warehousing company, a manufacturer of corrugated paper products, a food importer, and a light fixture distributor.

350 Industrial Way

Current tenant: Dee Engineering

Dee Engineering operates a fire brick sales and installation company on the premises. Hazardous materials are not used on site. Consequently, hazardous wastes are not generated on site. We did not observe improper use, storage, or disposal of hazardous materials or wastes during the site visit.

A gasoline UST was removed from this property in February 1991. The tank had been originally installed prior to the Kesslers' purchase of the property in September 1977. The party originally responsible for tank installation is unknown. The available information regarding the tank excavation is presented in Appendix B. Other than the information regarding the UST, regulatory agency files have no record of spills, leaks, or violations for operations conducted at this address.

366 Industrial Way

Current tenant: Regency House

Regency House operates a classic automobile restoration facility, primarily performing body work and a limited number of oil changes. Waste oil is temporarily stored on site in a covered 55-gallon drum; the oil is recycled periodically. Quarts of oil are stored on shelves. Waste solvents are disposed of in a Safety-Kleen solvent sink and catch drum and recycled once per month. Batteries are recycled immediately. No gasoline or other fuels are stored on the premises.

The CBFD records contain a letter dated August 1986 from the SMCDEH regarding the storage of waste oil in open drums on site. Regulatory agency files have no records of spills, leaks, or violations for operations conducted at this address.

Available historical information indicates previous tenants included a car storage business similar to the current tenant, a giftware importer, warehousing, and United Fleet, which operated a repair garage on the premises.

374 Industrial Way

Current tenant: L&D Trucking

L&D Trucking performs automotive repair at this facility. Hazardous materials used during site operations are oil, lubricants, transmission fluid, and propane. The oil is stored in two portable, 105-gallon sealed drums equipped with a pump dispenser. The lubricant and transmission fluid is stored in four 20-gallon, portable, sealed drums equipped with a pump dispenser. Hazardous wastes generated from these operations include four 55-gallon drums of waste oil located within a steel secondary container in a concrete-bermed area inside a shed attached to the rear of the building. The waste oil is reportedly picked up by a recycler every month. Waste solvents are discharged to a Safety-Kleen wash basin and drum system which is replaced every month. Waste battery cores are temporarily stored on the floor and on shelves near the front door; the cores

are reportedly picked up by a recycler every two weeks.

We did not observe improper use, storage, or disposal of hazardous materials or wastes during the site visit. Available regulatory agency files indicate that L&D Truck & Repair does not store more than 100 kilograms waste on site for more than 90 days and that wastes are not treated or disposed of on site. In June 1992, SMCDEH records indicate approximately 100 gallons per month of waste oil and approximately eight gallons per month of waste solvent are generated by the operations. From 1986 through 1990, the quantities of waste oil and waste solvent generated from operations were 220 gallons per three-month period and 55 gallons per year, respectively.

In August 1986 and August 1988, SMCDEH inspection reports include comments regarding on-site storage of open drums of waste oil for more than 90 days. Regulatory agency files have no records of spills, leaks, or violations for operations conducted at this address. There is no information available on previous tenants at this site.

400 Industrial Way

Current tenant: Mother's Cookies

Mother's Cookies operates office space and dry goods storage at this facility. Automotive maintenance is not conducted on site. No hazardous materials or wastes are reportedly used, stored, or disposed of at this facility.

We did not observe improper use, storage, or disposal of hazardous materials or wastes during the site visit. Regulatory agency files have no records of spills, leaks, or violations for operations conducted at this address. Available historical information indicates that previous tenants included Granny Goose.

4.0 HISTORY OF ON-SITE CHEMICAL USE

Based on the tenant interviews discussed above, the site visit, and a review of available regulatory agency files, present on-site chemical use in the Industrial Way properties includes automotive maintenance products such as motor oil, transmission fluid, and small amounts of chemical solvents; products used in the textile industry such as dyes and bleaching agents; and photochemicals. Currently, there are no known underground storage tanks at the site, although diesel and gasoline were once contained in USTs at the site. A summary of information available on the USTs is provided in Table 6. A list of chemicals known to be used on site currently and historically is presented on Table 7. Available information regarding the characteristics of these chemicals is presented in Appendix C.

Information on previous chemical use is limited. To the best of our knowledge, previous chemical use included chemicals commonly used in the hide and glue industry. The names of these chemicals (which were reportedly used by Stauffer Chemical) were obtained from the DTSC files. We understand similar operations were conducted on site from the early 1900s to about 1962. Therefore, it seems likely that similar chemicals were used on site by Pacific Bone, Coal & Fertilizer and Consolidated Chemical Co.

The list of historical chemicals presented in Table 7 includes Santobrite, which was formerly a Monsanto product. Santobrite was reportedly used by Stauffer Chemical. Treadwell & Rollo contacted Monsanto Chemical Co. in St. Louis, Missouri regarding this product. According to Dr. Robert Kaley of Monsanto Chemical Co., Santobrite is a sodium salt of pentachlorophenol and contains trace quantities of hexa-, hepta-, and octachlorodibenzo-p-dioxins. Santobrite was recommended as a preservative for wood and glue products. Monsanto Chemical ceased manufacture of this product in 1973, but referred us to the firm, Vulcan Chemicals, which manufactures pure pentachlorophenol. An MSDS for pentachlorophenol was obtained from Vulcan Chemical and is provided in

Appendix C. Treadwell & Rollo does not have access to information regarding the storage, use, or disposal of Santobrite when it was in use on site.

5.0 SUMMARY OF PREVIOUS ON-SITE INVESTIGATIONS

Several subsurface investigations have been performed on site. Treadwell & Rollo conducted a subsurface investigation and quarterly monitoring of groundwater at the site. Previous investigations have also been performed by others. The Treadwell & Rollo and UST investigations are summarized below. The location of borings, trenches and piezometers sampled for on- and off-site investigations is presented on Figure 12. The distribution of hydrocarbons and metals in site soil at the Industrial Way Properties from on-site investigations and available information from off-site investigations discussed in Section 6 are presented in Figures 13 through 21.

5.1 Soil Quality Assessment

Treadwell & Rollo, Inc. conducted a subsurface investigation at the site in August 1992. The purpose of the investigation was to: 1) assess the possible presence of Bunker C oil, lead, and copper in the soil at the site resulting from the known contamination at the adjacent Bayshore Railyard site; and 2) to characterize the lateral and vertical extent of these constituents, if present.

The investigation included continuously coring 11 soil borings (B-1 through B-11) at the site and obtaining soil samples for chemical analysis of Bunker C oil, lead and copper. A report on this investigation was previously submitted to the DTSC, RWQCB, and the San Mateo County Department of Environmental Health (SMCDEH). For your convenience, a copy of this report is included in Appendix D. Chromium analyses were subsequently performed on the samples collected in August 1992 to provide additional information regarding metals in on-site soil. The results are presented on Figure 21.

5.2 Groundwater Investigations

Since June 1992, Treadwell & Rollo, Inc. has performed quarterly monitoring of two on-site wells, K-1 and MW-1. A summary of the quarterly monitoring results was submitted to the SMCDEH and the RWQCB. A copy of the latest quarterly monitoring report (which includes a summary of groundwater sampling rounds conducted by previous consultants) is provided in Appendix E.

5.3 Underground Storage Tank Investigations

Underground storage tanks formerly at 250, 285, and 350 Industrial Way have been removed from the site by others. The removal of the tanks was discussed above in Section 3.3.4. Available information regarding the tank removal activities is provided in Appendix B.

6.0 SUMMARY OF OFF-SITE INVESTIGATIONS

Numerous investigations have been conducted at the Bayshore Railyard site regarding known contamination of soil and groundwater stemming from historical activities at the railyard by various technical consultants. A list of references from these off-site investigations is presented in Table 8.

Information from these investigations has been used to evaluate the effect of the historical activities on the Industrial Way properties site. Analytical results from both the on- and off-site investigations have been compiled on Figures 13 through 21. These figures exclude data collected from the Bayshore Railroad site prior to 1990 to simplify the data presentation. A review of these figures indicates the Industrial Way properties site has been affected by the historical activities conducted at the Bayshore Railyard site, either by migration of contaminants such as the Bunker C oil, or historical use of portions of the site, including the South Disposal Area.

7.0 SUMMARY OF INSURANCE INFORMATION

Available insurance information is summarized on Table 9. The Kesslers have maintained blanket insurance policies including general comprehensive and property damage coverage on the Industrial Way Properties. The amount of coverage at times has exceeded $10 million. The Kesslers do not have documents for insurance coverage available in the years 1977 to 1978, although the Kesslers believe the original broker was Albert Bender and that the insurance coverage was placed with Great American. No additional information regarding insurance coverage prior to the Kesslers' ownership of the property, or that of past and present tenants, is available.

FIGURES



Base Map: The Thomas Guide
San Mateo County
1990

0 1/2 Mile

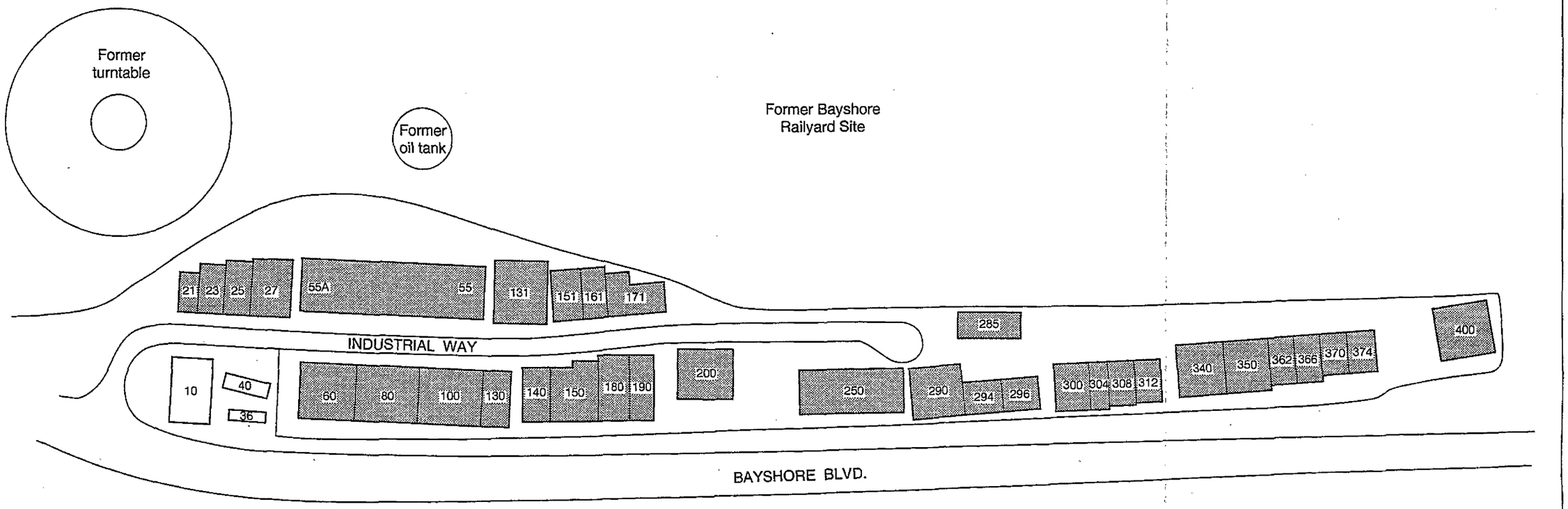
Approximate scale

INDUSTRIAL WAY PROPERTIES
Brisbane, California

SITE LOCATION MAP

TREADWELL & ROLLO, INC.
Consulting Engineers and Scientists

Project No. 1398.02 | Figure 1



0 200 Feet

Approximate scale

KEY

21 Property owned by Kessler and Kessler

Notes: 1. Industrial Way Properties includes 21 through 27, and 55 through 400 Industrial Way.

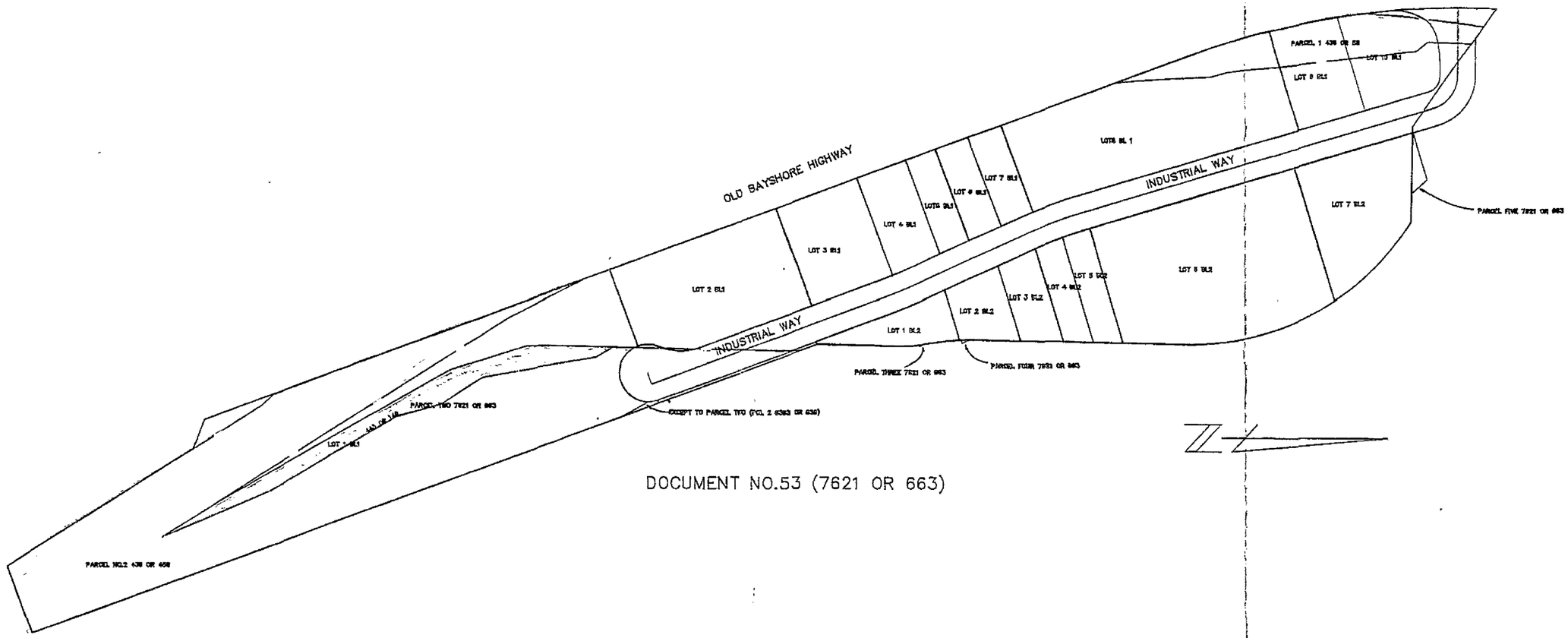
2. Map is based on Pacific Aerial Surveys photograph no. AV-4075-6-14 dated 2 July 1991.

INDUSTRIAL WAY PROPERTIES
Brisbane, California

SITE PLAN

Project No. 1398.02 | Figure 2

TREADWELL & ROLLO, INC.
Consulting Engineers and Scientists



DOCUMENT NO.53 (7621 OR 663)

DOCUMENT NO. 31 (445 OR 149) SOUTHERN PACIFIC TO PACIFIC BONE COAL AND FERT. CØ/1929
DOCUMENT NO. 30 (436 OR 58) SOUTHERN PACIFIC TO PACIFIC BONE COAL AND FERT. CO/1929

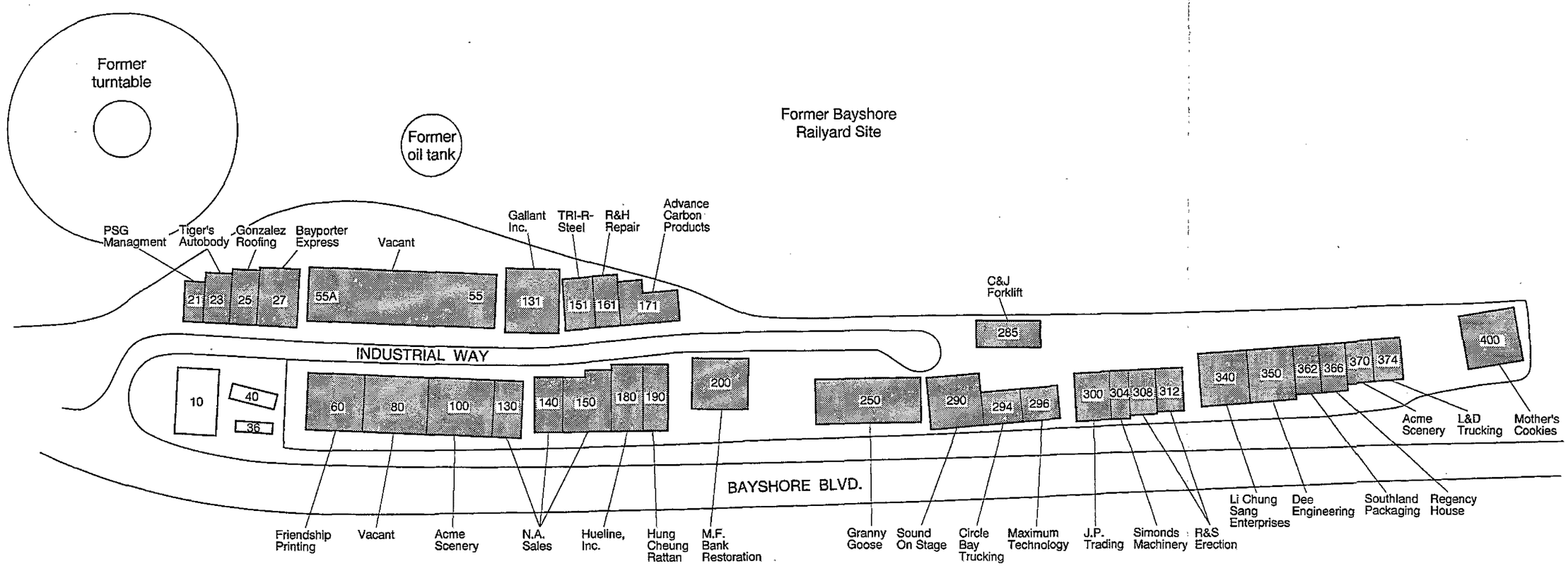
Not to scale

INDUSTRIAL WAY PROPERTIES
Brisbane, California

TRANSFER OF OWNERSHIP MAP
1929

Project No. 1398.02	Figure 3

TREADWELL & ROLLO, INC.
Consulting Engineers and Scientists



KEY

21 Property owned by Kessler and Kessler

Notes: 1. Industrial Way Properties includes 21 through 27, and 55 through 400 Industrial Way.

2. Map is based on Pacific Aerial Surveys photograph no. AV-4075-6-14 dated 2 July 1991.

INDUSTRIAL WAY PROPERTIES
Brisbane, California

MAP OF CURRENT TENANTS

Project No. 1398.02 | Figure 4

TREADWELL & ROLLO, INC.
Consulting Engineers and Scientists



Photograph source: Pacific Aerial Surveys
photograph no. AV-248-8-2
dated 1935

0 200 Feet

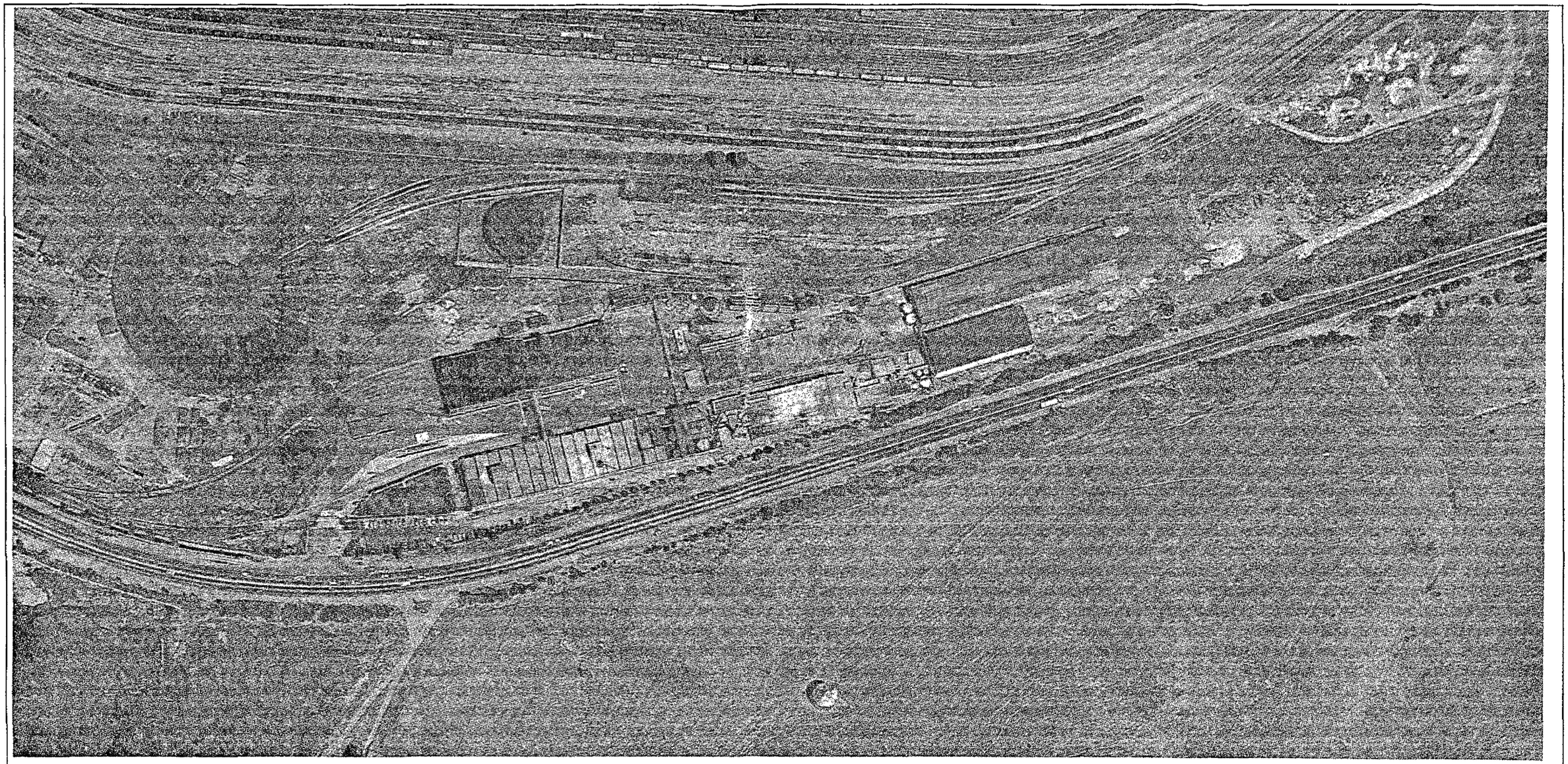
Approximate scale

INDUSTRIAL WAY PROPERTIES
Brisbane, California

HISTORICAL AERIAL PHOTOGRAPH
1935

Project No. 1398.02 | Figure 5

TREADWELL & ROLLO, INC.
Consulting Engineers and Scientists



Photograph source: Pacific Aerial Surveys
photograph no. AV-17-10-19
dated 1948

0 200 Feet
Approximate scale

INDUSTRIAL WAY PROPERTIES
Brisbane, California

HISTORICAL AERIAL PHOTOGRAPH
1948

Project No. 1398.02 | Figure 6

TREADWELL & ROLLO, INC.
Consulting Engineers and Scientists



Photograph source: Pacific Aerial Surveys
photograph no. AV-432-16-12
dated 20 June 1961

0 200 Feet
Approximate scale

INDUSTRIAL WAY PROPERTIES
Brisbane, California

HISTORICAL AERIAL PHOTOGRAPH
20 JUNE 1961

Project No. 1398.02 | Figure 7

TREADWELL & ROLLO, INC.
Consulting Engineers and Scientists



Photograph source: Pacific Aerial Surveys
photograph no. AV-1045-7-14
dated 10 May 1972

0 200 Feet

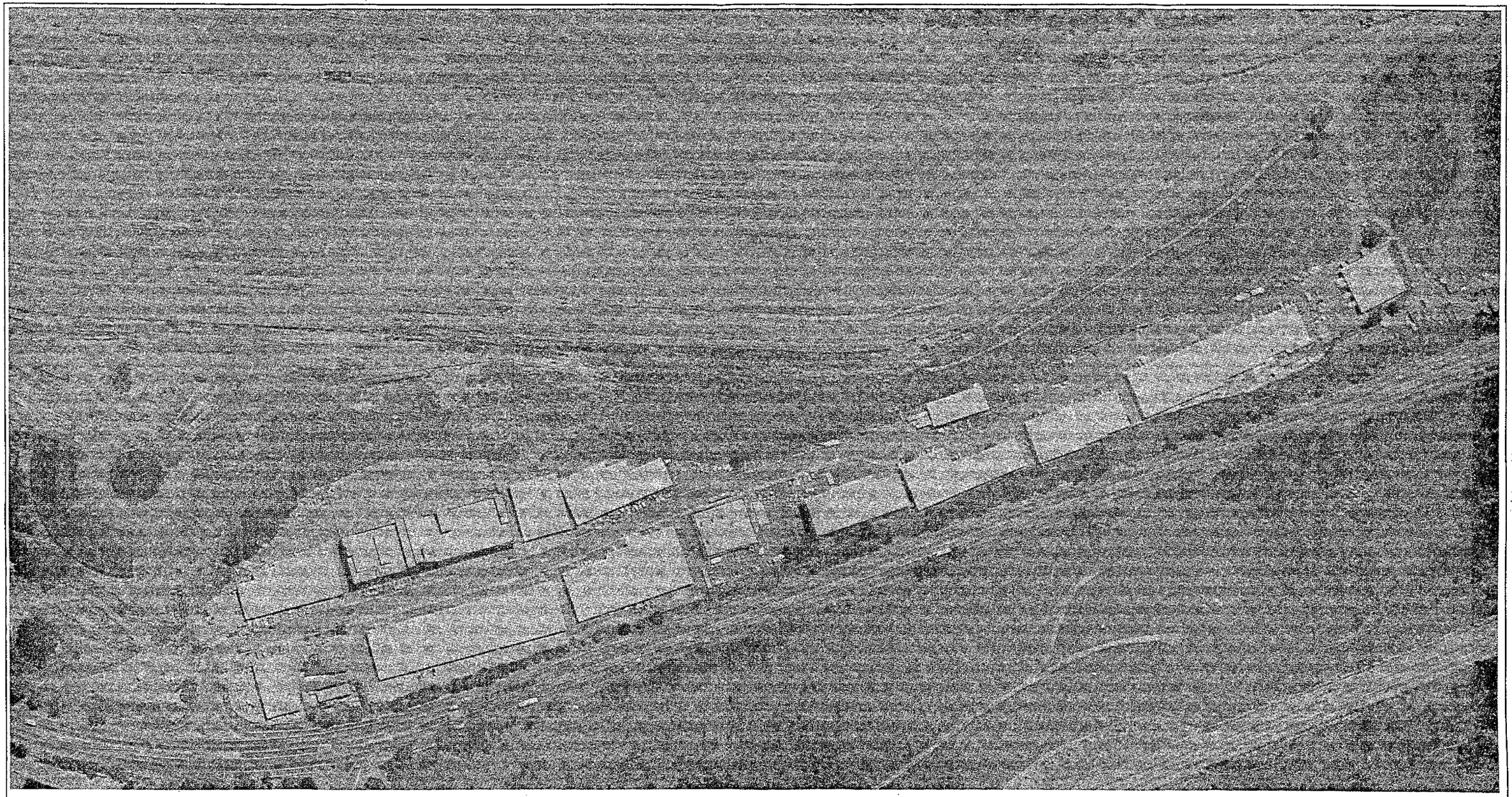
Approximate scale

INDUSTRIAL WAY PROPERTIES
Brisbane, California

HISTORICAL AERIAL PHOTOGRAPH
10 MAY 1972

Project No. 1398.02 | Figure 8

TREADWELL & ROLLO, INC.
Consulting Engineers and Scientists



Photograph source: Pacific Aerial Surveys
photograph no. AV-4075-6-14
dated 2 July 1991

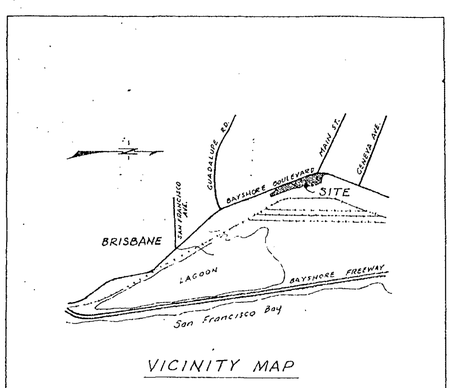
0 200 Feet
Approximate scale

INDUSTRIAL WAY PROPERTIES
Brisbane, California

HISTORICAL AERIAL PHOTOGRAPH
2 JULY 1991

Project No. 1398.02 | Figure 9

TREADWELL & ROLLO, INC.
Consulting Engineers and Scientists



VICINITY MAP

LEGEND:

- Tract Boundary
- Existing Building
- Existing Asphaltic Pavement
- Existing Concrete Slab
- Existing Cyclone Fence
- Existing Trees
- Existing Ground Elevation
- Existing Railroad Tracks
- Existing Fire Hydrant
- Existing Storm Sewer & Manhole
- Existing Sanitary Sewer
- Existing Gas Line
- Proposed Water Line, Fire Hydrant & Gate Valve
- Proposed Sanitary Sewer, Manhole & Cleanout
- Proposed Storm Sewer & Catch Basin
- Proposed Easement
- Lot Number
- Block Number
- Street Grade
- Electrolier
- Shaded Area to be acquired from S.P.R.R.
- Boundary to be determined but a rt. angle (approx.) intersection is proposed as shown.

SECTION INDUSTRIAL WAY
NO SCALE

NOTES:

1. Owner of record: Stauffer Chemical Co., 636 California St, S.F.
2. Developer, and Owner by Option: Atlas Heating & Ventilating Co., Ltd., 557 Fourth St., San Francisco. (Mr. James Tuck)
3. Assessor's Parcel Number of area to be subdivided: 05-142-010.
4. Storm sewers and sanitary sewers to connect into existing brick arch sewer running along the Easterly side of Bayshore Blvd.
5. All sanitary sewers to be 8" V.C.P. at 0.30% slope, unless noted otherwise, and will be connected in accordance with Bayshore Sanitary Dist. criteria.
6. Storm drain lines designed for a slope of 0.30% approximately.
7. Water supply from the proposed new line along the Westerly side of Bayshore Blvd. In the event the proposed off-site line is constructed later, this project will be served by means of connection to existing lines and present water source from tank West of Bayshore Blvd.
8. All improvements will be constructed in accordance with the recommendations of a Soils Engineer. Design criteria will be established before completion of improvement plans.
9. Site grading requirements are to be established according to individual lot needs, determined by building type and location on lot. Grading will take place at time of building construction. However, at the northernmost portion of the project a potential flooding condition may exist. This condition will be verified before final plans are completed, and before the final map is recorded. If a problem does exist, it will be corrected during construction.
10. Two sewer lines have been shown on previous maps to cross the site at the Northerly end (Lots 3, 16 & 17) and connect to the existing line. (Two 24" V.C.P. sanitary lines). The existence or use of these has not been presently verified. In the event they are found to be of use, easements will be provided for them on the final map.
11. Existing sanitary sewers, storm sewers, water lines and fire hydrants within the site area and presently serving the site, to be abandoned before being abandoned and replaced by new improvements.
12. The existing P.G.&E. Co. pole line to be relocated on the site as necessary to service the development.
13. Design calculations for all improvements will be submitted to the City Engineer for approval, prior to the completion of improvement Plans.
14. Lot dimensions shown hereon are approximate.
15. This site contains approximately 18 acres of land within the boundary. The proposed street rights of way, as shown, occupy approximately 2.2 acres. The remaining approximately 15.8 acres is shown hereon subdivided into 24 lot's. The average lot area is approximately 0.63 acres, or 27,550 sq. ft.
16. All lots having double frontage, will be forbidden access to and from Bayshore Blvd., by dedication of a 1' non-access easement to City of Brisbane.
17. Where existing easements have no width of record, specific width will be determined from the requirements of the public agency involved, and will be shown on the final map.
- ⑤ 18. The design and feasibility of construction of sewer, water, storm drain and street connection of Industrial Way with Bayshore Blvd. will require additional study and decisions or actions by others, which may result in design based on more detailed information, may result in alternate storm and sanitary sewer connections or locations, alternate water system, revised street grades, sewer pump stations, or other revisions.

⑥	S.R.	6/17/68	Industrial Way Re-alignment
⑤	J.T.	6/12/68	Addition of note 18.
④	J.T.	6/12/68	General revision to Industrial Way alignment
	"	"	drainage & sewer and water vacinity lots 13-17
③	J.T.	6/11/68	Remove SAVOY-STREET SECTION & REVISION ⚠
②	R.M.	11/9/67	street & existing Plan shown and note 18
⚠	R.M.	11/1/67	Water Sewer & new street Section
BY	DATE	REVISIONS	

BENCH MARK NOTE:

Bench Mark for elevations shown hereon is a U.S.C. & G.S. bronze disk set in the top of the East end of the South concrete abutment of a 15' x 8' concrete culvert located 0.2 mile North along the S.P.R.R. from the Brisbane Tower, having an elevation of 10.443 feet. (July 1956)

INDUSTRIAL WAY PROPERTIES
Brisbane, California
Project No: 1398.02 | Figure 10
TREADWELL & ROLLO, INC.
Consulting Engineers and Scientists

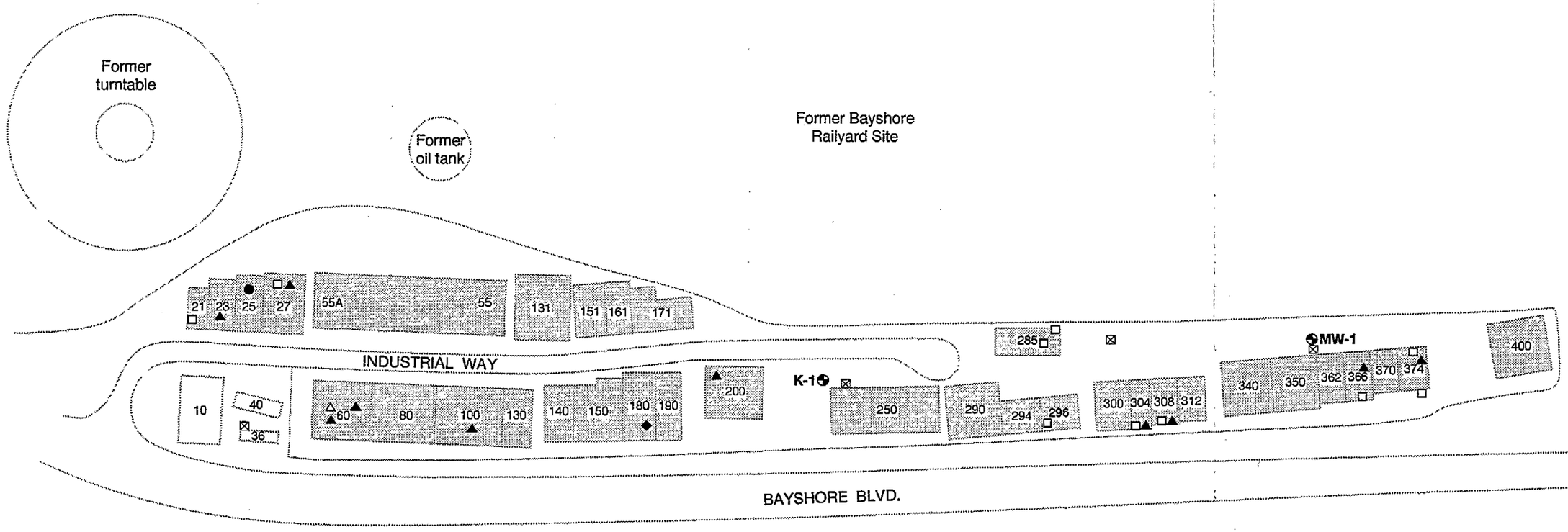
REGISTERED PROFESSIONAL ENGINEER
RONALD E. CALHOUN
No. 15503
CIVIL
REGISTERED
11-30-67

	BY.	DATE
Design	W.C.N.	Oct. 67
Drawn	M.R.H.	10/17/67
Ck'd.		
Ck'd/Const.		
Proj. Eng.		
Div. Eng.		
Pd. M. No.		

1035 E. HILLSDALE BOULEVARD
WILSEY & HAM
SAN MATEO CALIFORNIA

BRISBANE INDUSTRIAL DISTRICT
REVISED TENTATIVE MAP
BRISBANE CALIFORNIA

DWG. NO. 53-0101-30 D1
SCALE 1" = 100'
JUNE 1968



KEY

- Location of groundwater monitoring well
- Location of former underground storage tank
- Location of automotive fluids/oils storage area observed during March 1993 site visit
- Location of gasoline (stored in portable drums) observed during March 1993 site visit
- Location of paints and/or solvents storage area observed during March 1993 site visit
- Location of photochemicals storage area observed during March 1993 site visit
- Location of textile dyeing chemicals storage area observed during March 1993 site visit
- 21 Property owned by Kessler and Kessler

Notes:
1. Industrial Way Properties includes 21 through 27, and 55 through 400 Industrial Way.
2. Map is based on Pacific Aerial Surveys photograph no. AV-4075-6-14 dated 2 July 1991.
3. Locations of monitoring wells, former underground storage tanks, and chemical storage areas are approximate.

0 200 Feet

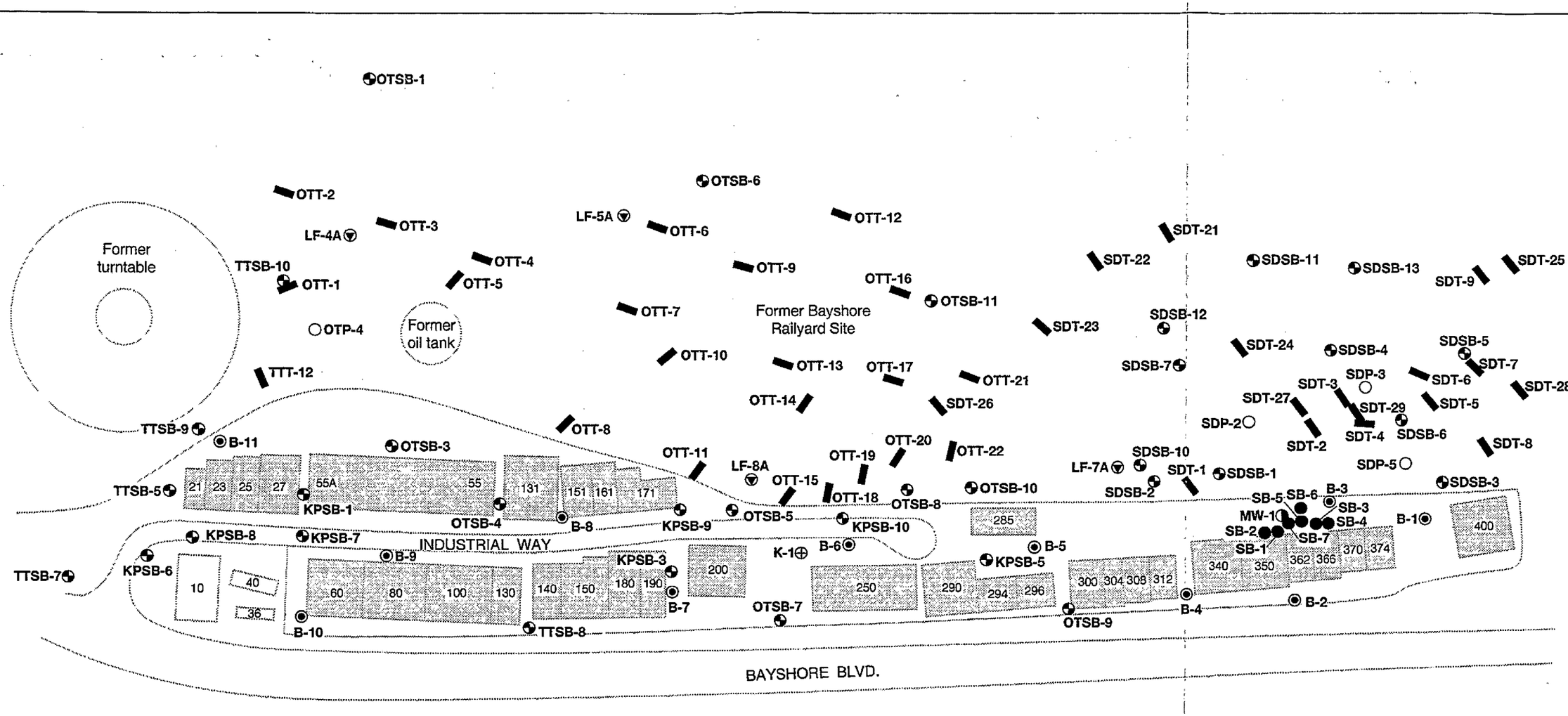
Approximate scale

INDUSTRIAL WAY PROPERTIES
Brisbane, California

MAP OF FORMER UNDERGROUND STORAGE TANK LOCATIONS AND CURRENT CHEMICAL STORAGE AREAS

Project No. 1398.02 | Figure 11

TREADWELL & ROLLO, INC.
Consulting Engineers and Scientists



KEY

- ◉ Soil boring, B- series (Treadwell & Rollo, Inc., 15 October 1992)
- ⊕ Groundwater monitoring well, K-1 (Aqua Resources, 30 September 1988)
- ◑ Groundwater monitoring well, MW-1 (Geomatrix Consultants, November 1991)
- ● Soil boring, SB- series (Geomatrix Consultants, November 1991)
- ◓ Soil boring, TTSB-; KPSB-; OTSB-; and SDSB- series (Levine•Fricke, 31 July 1990 and 16 October 1992)
- ▽ Groundwater monitoring well, LF-series (Levine• Fricke, 16 October 1992)
- ○ Piezometer, SDP- and OTP- series (Levine•Fricke, 16 October 1992)
- ▬ Trench, OTT-; TTT-; and SDT- series (Levine•Fricke, 31 July 1990 and 16 October 1992)

Notes:
1. Industrial Way Properties includes 21 through 27, and 55 through 400 Industrial Way.
2. Map is based on Pacific Aerial Surveys photograph no. AV-4075-6-14 dated 2 July 1991.
3. Locations of borings, wells, trenches, and piezometers are approximate.
4. The sampling locations presented exclude data points for the former Bayshore Railyard site prior to 1990.

0 200 Feet

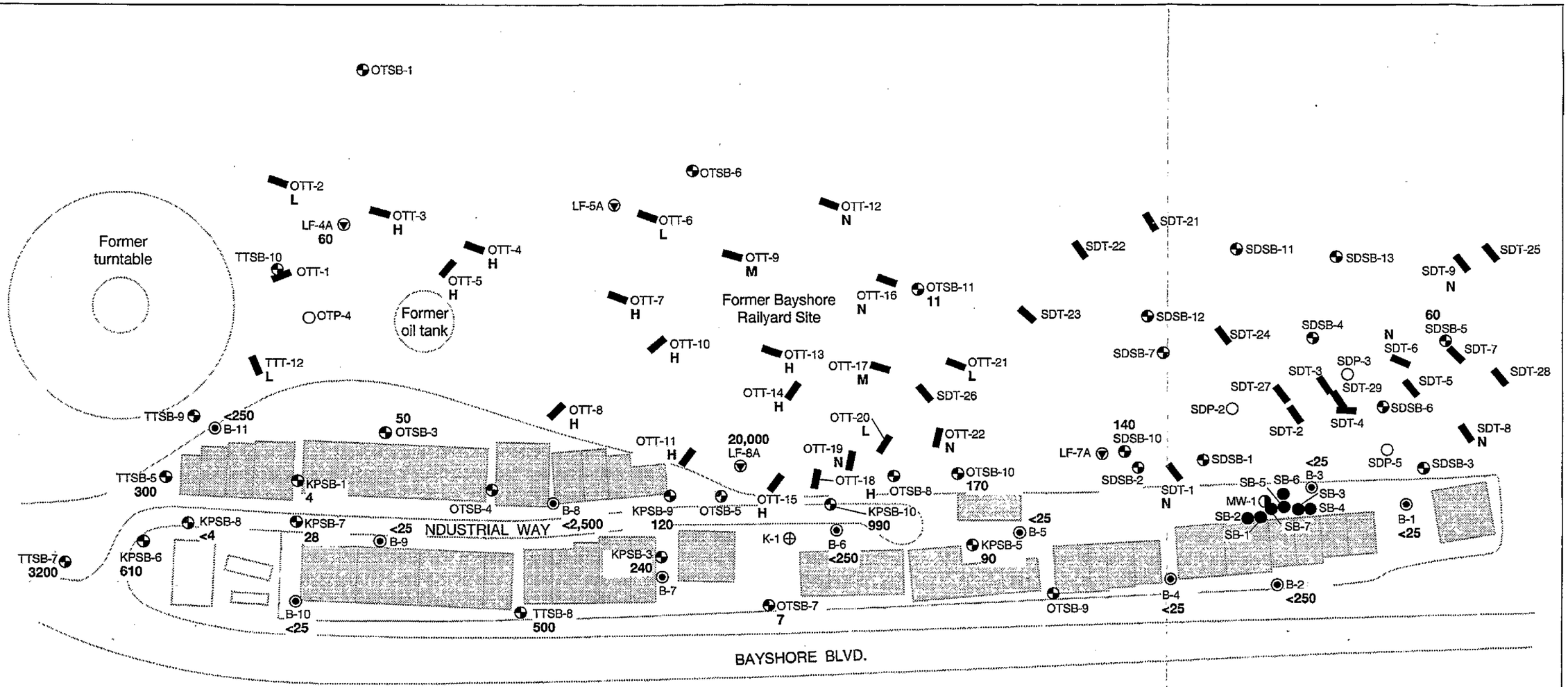
Approximate scale

INDUSTRIAL WAY PROPERTIES
Brisbane, California

MAP OF SAMPLING LOCATIONS

Project No. 1398.02 | Figure 12

TREADWELL & ROLLO, INC.
Consulting Engineers and Scientists



KEY

- ◉ Soil boring, B- series (Treadwell & Rollo, Inc., 15 October 1992)
- ⊕ Groundwater monitoring well, K-1 (Aqua Resources, 30 September 1988)
- ◑ Groundwater monitoring well, MW-1 (Geomatrix Consultants, November 1991)
- ● Soil boring, SB- series (Geomatrix Consultants, November 1991)
- ◓ Soil boring, TTSB-; KPSB-; OTSB-; and SDSB- series (Levine•Fricke, 31 July 1990 and 16 October 1992)
- ▽ Groundwater monitoring well, LF-series (Levine• Fricke, 16 October 1992)
- ○ Piezometer, SDP- and OTP- series (Levine•Fricke, 16 October 1992)
- ◢ Trench, OTT-; TTT-; and SDT- series (Levine•Fricke, 31 July 1990 and 16 October 1992)
- N No Bunker C oil observed in trench
- L Light Bunker C oil observed in trench
- M Moderate Bunker C oil observed in trench
- H Heavy Bunker C oil observed in trench

Notes:
1. Industrial Way Properties includes 21 through 27, and 55 through 400 Industrial Way.
2. Map is based on Pacific Aerial Surveys photograph no. AV-4075-6-14 dated 2 July 1991.
3. Locations of borings, wells, trenches, and piezometers are approximate.
4. The sampling locations presented exclude data points for the former Bayshore Railyard site prior to 1990.
5. Concentrations are presented in milligrams per kilogram.
6. Chemical data presented on this map is based on various reports referenced in the text and reflects chemical analysis at different points in time. Lack of a value for a particular sampling location indicates that the soil was not tested for this constituent at this depth interval or that the data is not available in the sources referenced in the text.
7. If more than one value is available for this depth interval, the maximum concentration is presented.
8. Soil samples from borings B-1 through B-11 analyzed for total petroleum hydrocarbons as Bunker C oil using California DHS LUFT method.
9. Soil samples from the KPSB-, OTSB-, SDSB-series borings analyzed for total petroleum hydrocarbons as waste oil by modified EPA method 8015.
10. The presence of Bunker C oil in the Bayshore Railroad trenches was evaluated visually by Levine•Fricke.

0 200 Feet

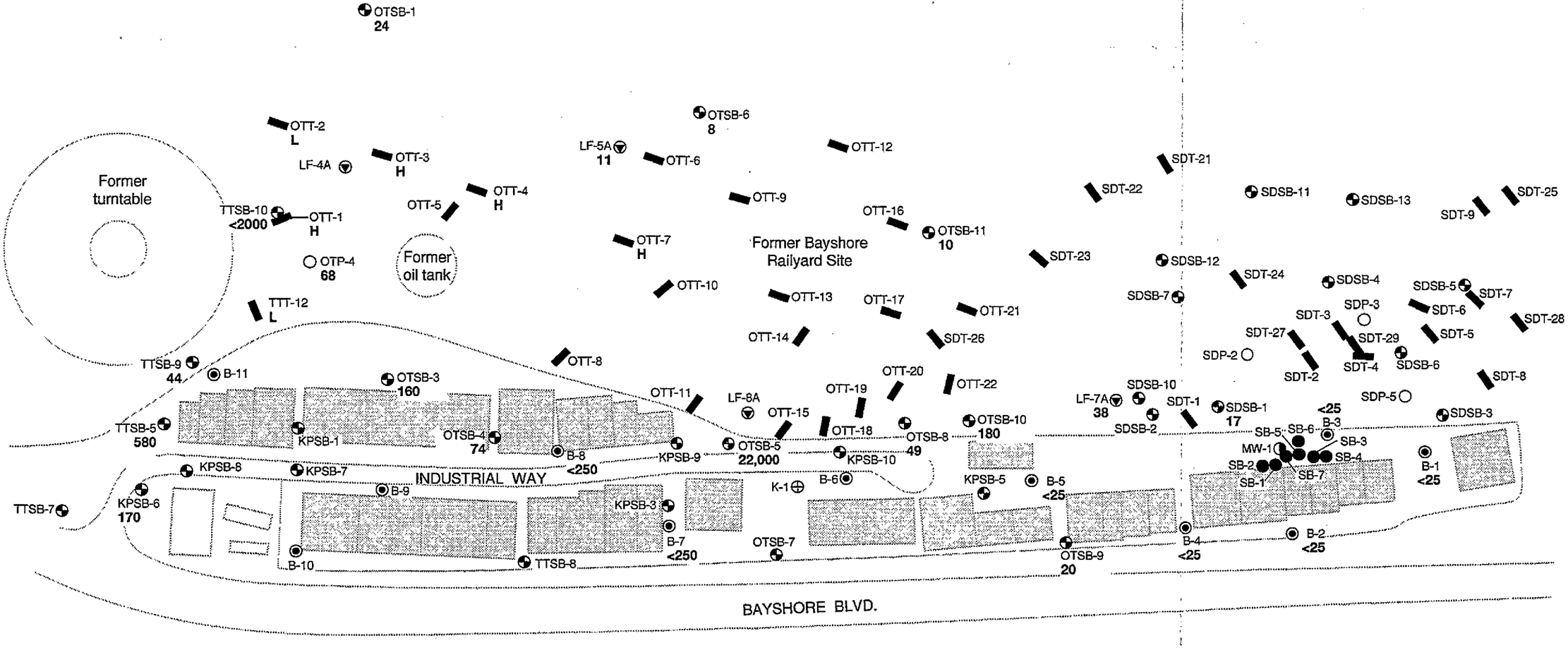
Approximate scale

INDUSTRIAL WAY PROPERTIES
Brisbane, California

TOTAL PETROLEUM HYDROCARBONS AS BUNKER C OR WASTE OIL IN SOIL (1 TO 7 FEET)

Project No. 1398.02 | Figure 13

TREADWELL & ROLLO, INC.
Consulting Engineers and Scientists



KEY

- Soil boring, B- series (Treadwell & Rollo, Inc., 15 October 1992)
- Groundwater monitoring well, K-1 (Aqua Resources, 30 September 1988)
- Groundwater monitoring well, MW-1 (Geomatrix Consultants, November 1991)
- Soil boring, SB- series (Geomatrix Consultants, November 1991)
- Soil boring, TTSB-; KPSB-; OTSB-; and SDSB- series (Levine•Fricke, 31 July 1990 and 16 October 1992)
- Groundwater monitoring well, LF-series (Levine• Fricke, 16 October 1992)
- Piezometer, SDP- and OTP- series (Levine•Fricke, 16 October 1992)
- Trench, OTT-; TTT-; and SDT- series (Levine•Fricke, 31 July 1990 and 16 October 1992)
- N No Bunker C oil observed in trench
- L Light Bunker C oil observed in trench
- M Moderate Bunker C oil observed in trench
- H Heavy Bunker C oil observed in trench

Notes:

1. Industrial Way Properties includes 21 through 27, and 55 through 400 Industrial Way.
2. Map is based on Pacific Aerial Surveys photograph no. AV-4075-6-14 dated 2 July 1991.
3. Locations of borings, wells, trenches, and piezometers are approximate.
4. The sampling locations presented exclude data points for the former Bayshore Railyard site prior to 1990.
5. Concentrations are presented in milligrams per kilogram.
6. Chemical data presented on this map is based on various reports referenced in the text and reflect chemical analysis at different points in time. Lack of a value for a particular sampling location indicates that the soil was not tested for this constituent at this depth interval or that the data is not available in the sources referenced in the text.
7. If more than one value is available for this depth interval, the maximum concentration is presented.
8. Soil samples from borings B-1 through B-11 analyzed for total petroleum hydrocarbons as Bunker C oil using California DHS LUFT method.
9. Soil samples from the KPSB-, OTSB-, SDSB-series borings analyzed for total petroleum hydrocarbons as waste oil by modified EPA method 8015.
10. The presence of Bunker C oil in the Bayshore Railroad trenches was evaluated visually by Levine•Fricke.

0 200 Feet

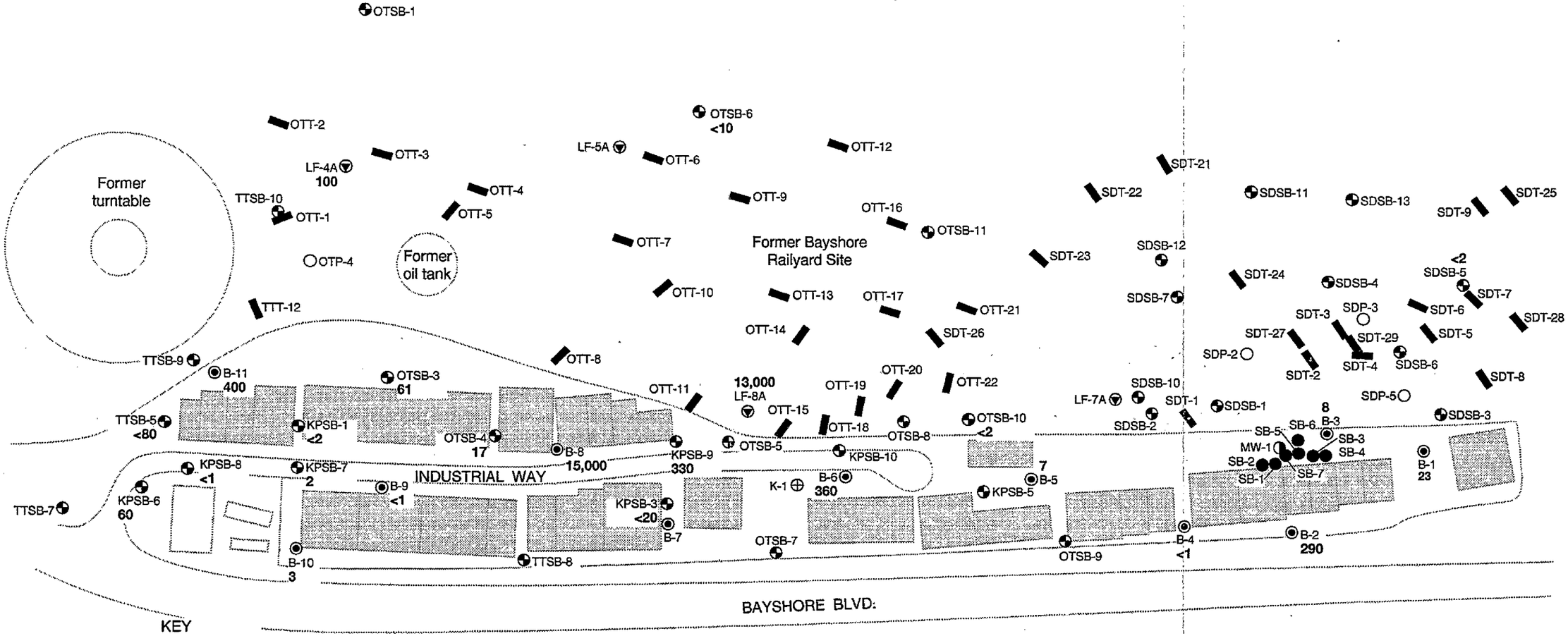
Approximate scale

INDUSTRIAL WAY PROPERTIES
Brisbane, California

TOTAL PETROLEUM HYDROCARBONS AS BUNKER C OR WASTE OIL IN SOIL (8 TO12 FEET)

Project No. 1398.02 | Figure 14

TREADWELL & ROLLO, INC.
Consulting Engineers and Scientists



- ◉ Soil boring, B- series (Treadwell & Rollo, Inc., 15 October 1992)
- ⊕ Groundwater monitoring well, K-1 (Aqua Resources, 30 September 1988)
- ◑ Groundwater monitoring well, MW-1 (Geomatrix Consultants, November 1991)
- ● Soil boring, SB- series (Geomatrix Consultants, November 1991)
- ◓ Soil boring, TTSB-; KPSB-; OTSB-; and SDSB- series (Levine•Fricke, 31 July 1990 and 16 October 1992)
- ▽ Groundwater monitoring well, LF-series (Levine• Fricke, 16 October 1992)
- ○ Piezometer, SDP- and OTP- series (Levine•Fricke, 16 October 1992)
- ▬ Trench, OTT-; TTT-; and SDT- series (Levine•Fricke, 31 July 1990 and 16 October 1992)

Notes:

1. Industrial Way Properties includes 21 through 27, and 55 through 400 Industrial Way.
2. Map is based on Pacific Aerial Surveys photograph no. AV-4075-6-14 dated 2 July 1991.
3. Locations of borings, wells, trenches, and piezometers are approximate.
4. The sampling locations presented exclude data points for the former Bayshore Railyard site prior to 1990.
5. Concentrations are presented in milligrams per kilogram.
6. Chemical data presented on this map is based on various reports referenced in the text and reflect chemical analysis at different points in time. Lack of a value for a particular sampling location indicates that the soil was not tested for this constituent at this depth interval or that the data is not available in the sources referenced in the text.
7. If more than one value is available for this depth interval, the maximum concentration is presented.
8. Soil samples analyzed from borings B-1 through B-11 for total hydrocarbons as diesel by California DHS LUFT method.
9. Soil samples from the TTSB-, KPSB-, OTSB-, and SDSB- series borings analyzed for total petroleum hydrocarbons as diesel by modified EPA Method 8015. Levine•Fricke notes that hydrocarbons present in diesel range may be part of waste oil present in samples.

0 200 Feet

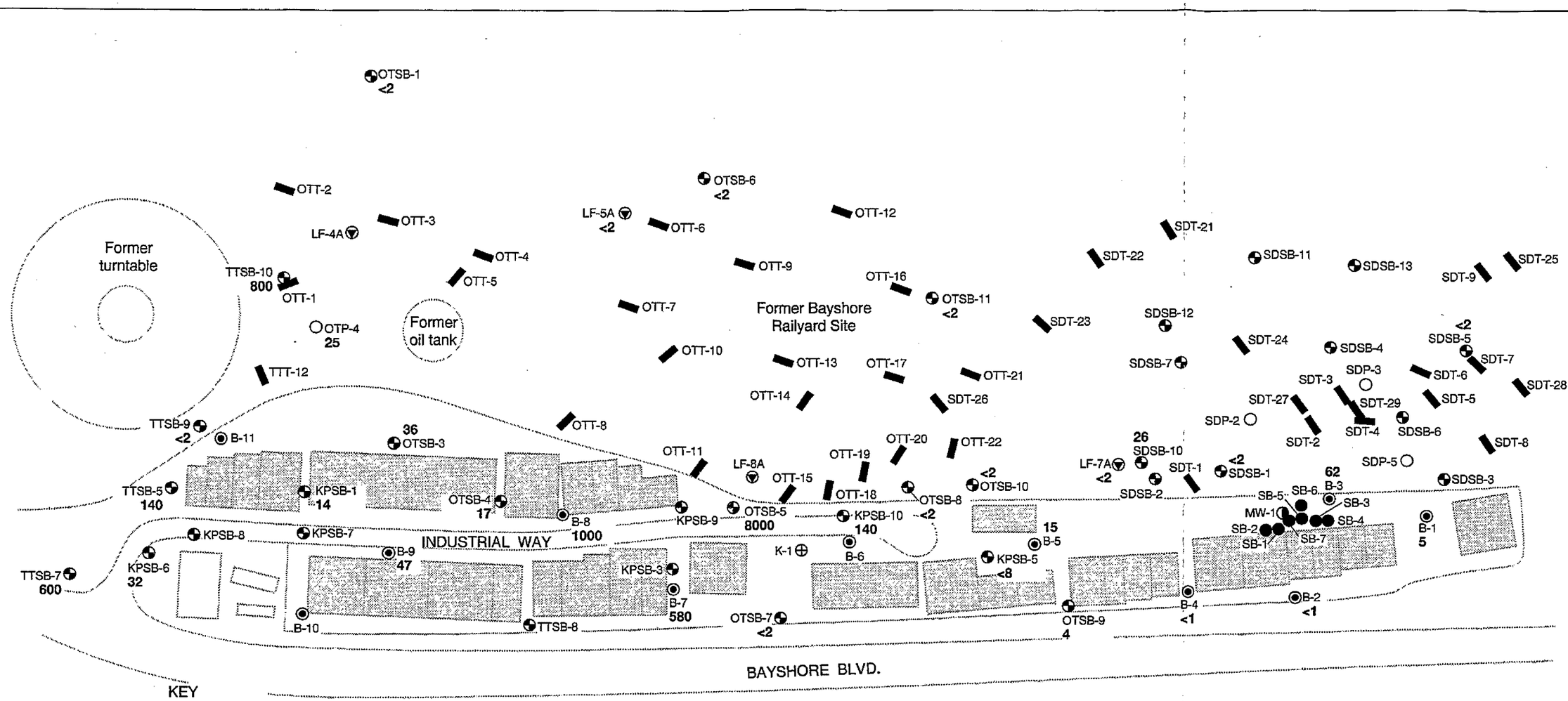
Approximate scale

INDUSTRIAL WAY PROPERTIES
Brisbane, California

TOTAL PETROLEUM HYDROCARBONS AS DIESEL IN SOIL (2 TO 6.5 FEET)

Project No. 1398.02 | Figure 15

TREADWELL & ROLLO, INC.
Consulting Engineers and Scientists



- ◉ Soil boring, B- series (Treadwell & Rollo, Inc., 15 October 1992)
- ⊕ Groundwater monitoring well, K-1 (Aqua Resources, 30 September 1988)
- ◑ Groundwater monitoring well, MW-1 (Geomatrix Consultants, November 1991)
- ● Soil boring, SB- series (Geomatrix Consultants, November 1991)
- ◓ Soil boring, TTSB-; KPSB-; OTSB-; and SDSB- series (Levine•Fricke, 31 July 1990 and 16 October 1992)
- ▽ Groundwater monitoring well, LF-series (Levine• Fricke, 16 October 1992)
- ○ Piezometer, SDP- and OTP- series (Levine•Fricke, 16 October 1992)
- ◢ Trench, OTT-; TTT-; and SDT- series (Levine•Fricke, 31 July 1990 and 16 October 1992)

Notes:

1. Industrial Way Properties includes 21 through 27, and 55 through 400 Industrial Way.
2. Map is based on Pacific Aerial Surveys photograph no. AV-4075-6-14 dated 2 July 1991.
3. Locations of borings, wells, trenches, and piezometers are approximate.
4. The sampling locations presented exclude data points for the former Bayshore Railyard site prior to 1990.
5. Concentrations are presented in milligrams per kilogram.
6. Chemical data presented on this map is based on various reports referenced in the text and reflect chemical analysis at different points in time. Lack of a value for a particular sampling location indicates that the soil was not tested for this constituent at this depth interval or that the data is not available in the sources referenced in the text.
7. If more than one value is available for this depth interval, the maximum concentration is presented.
8. Soil samples analyzed from borings B-1 through B-11 for total hydrocarbons as diesel by California DHS LUFT method.
9. Soil samples from the TTSB-, KPSB-, OTSB-, and SDSB- series borings analyzed for total petroleum hydrocarbons as diesel by modified EPA Method 8015. Levine•Fricke notes that hydrocarbons present in diesel range may be part of waste oil present in samples.

0 200 Feet

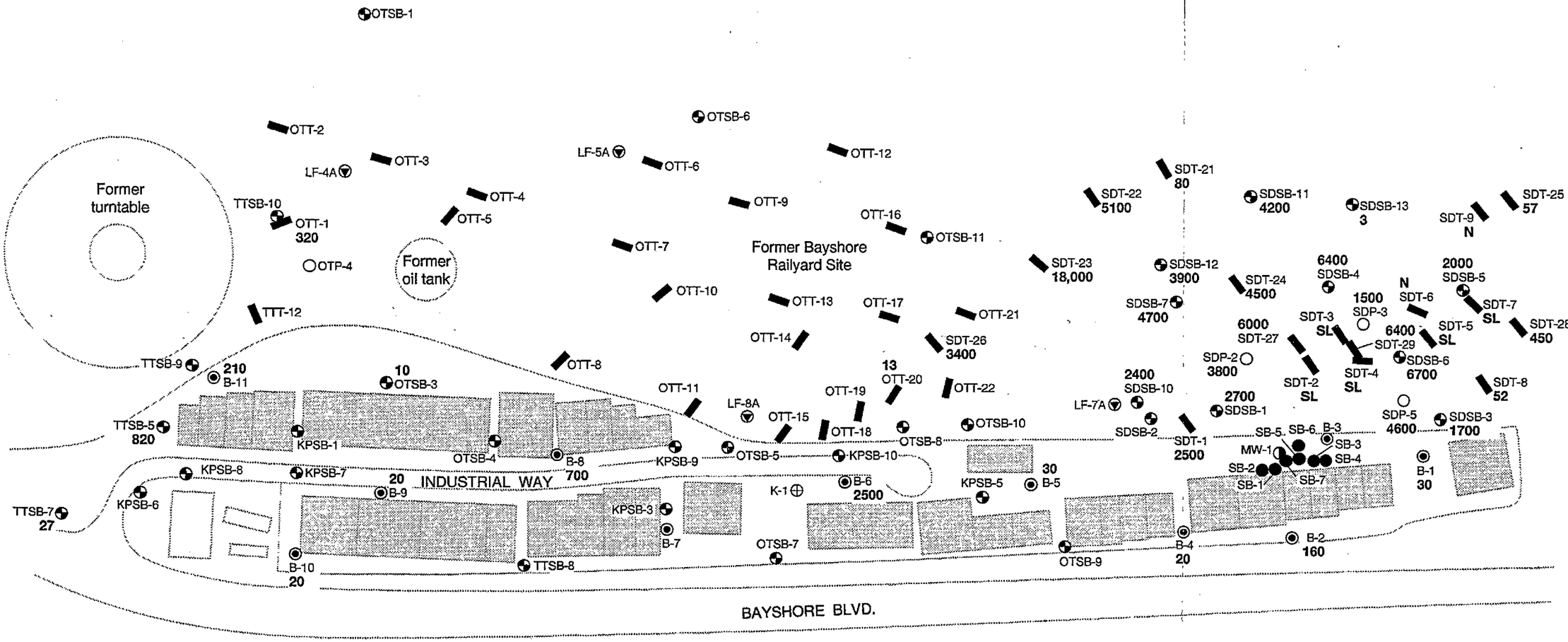
Approximate scale

INDUSTRIAL WAY PROPERTIES
Brisbane, California

TOTAL PETROLEUM HYDROCARBONS AS DIESEL IN SOIL (7 TO 14.5 FEET)

Project No. 1398.02 | Figure 16

TREADWELL & ROLLO, INC.
Consulting Engineers and Scientists



KEY

- Soil boring, B- series (Treadwell & Rollo, Inc., 15 October 1992)
- Groundwater monitoring well, K-1 (Aqua Resources, 30 September 1988)
- Groundwater monitoring well, MW-1 (Geomatrix Consultants, November 1991)
- Soil boring, SB- series (Geomatrix Consultants, November 1991)
- Soil boring, TTSB-; KPSB-; OTSB-; and SDSB- series (Levine•Fricke, 31 July 1990 and 16 October 1992)
- Groundwater monitoring well, LF-series (Levine• Fricke, 16 October 1992)
- Piezometer, SDP- and OTP- series (Levine•Fricke, 16 October 1992)
- Trench, OTT-; TTT-; and SDT- series (Levine•Fricke, 31 July 1990 and 16 October 1992)
- SL Metal slag observed in trench
- N Metal slag not observed in trench

Notes:
1. Industrial Way Properties includes 21 through 27, and 55 through 400 Industrial Way.
2. Map is based on Pacific Aerial Surveys photograph no. AV-4075-6-14 dated 2 July 1991.
3. Locations of borings, wells, trenches, and piezometers are approximate.
4. The sampling locations presented exclude data points for the former Bayshore Railyard site prior to 1990.
5. Concentrations are presented in milligrams per kilogram.
6. Chemical data presented on this map is based on various reports referenced in the text and reflect chemical analysis at different points in time. Lack of a value for a particular sampling location indicates that the soil was not tested for this constituent at this depth interval or that the data is not available in the sources referenced in the text.
7. If more than one value is available for this depth interval, the maximum concentration is presented.

0 200 Feet

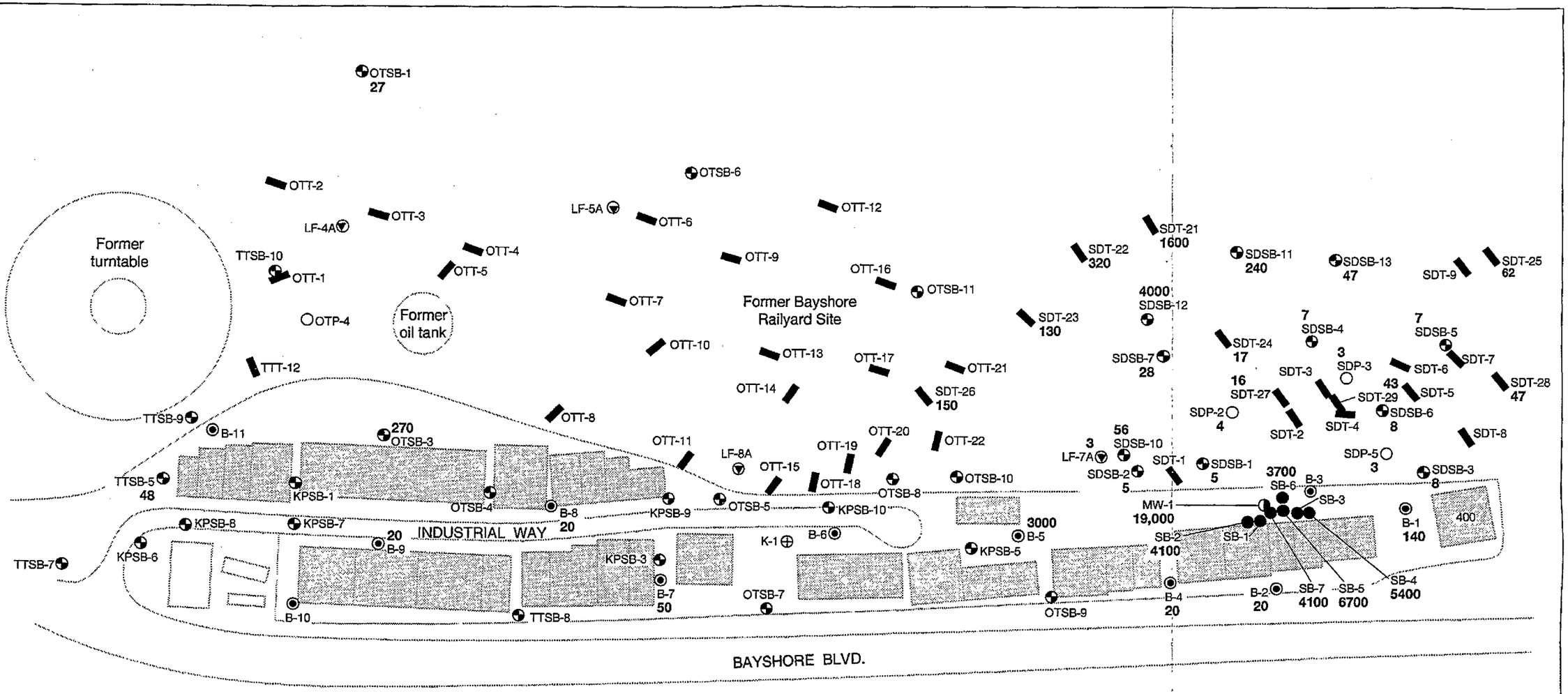
Approximate scale

INDUSTRIAL WAY PROPERTIES
Brisbane, California

LEAD IN SOIL (0 TO 7 FEET)

Project No. 1398.02 | Figure 17

TREADWELL & ROLLO, INC.
Consulting Engineers and Scientists



KEY

- Soil boring, B- series (Treadwell & Rollo, Inc., 15 October 1992)
- Groundwater monitoring well, K-1 (Aqua Resources, 30 September 1988)
- Groundwater monitoring well, MW-1 (Geomatrix Consultants, November 1991)
- Soil boring, SB- series (Geomatrix Consultants, November 1991)
- Soil boring, TTSB-; KPSB-; OTSB-; and SDSB- series (Levine•Fricke, 31 July 1990 and 16 October 1992)
- Groundwater monitoring well, LF-series (Levine• Fricke, 16 October 1992)
- Piezometer, SDP- and OTP- series (Levine•Fricke, 16 October 1992)
- Trench, OTT-; TTT-; and SDT- series (Levine•Fricke, 31 July 1990 and 16 October 1992)

Notes:

1. Industrial Way Properties includes 21 through 27, and 55 through 400 Industrial Way.
2. Map is based on Pacific Aerial Surveys photograph no. AV-4075-6-14 dated 2 July 1991.
3. Locations of borings, wells, trenches, and piezometers are approximate.
4. The sampling locations presented exclude data points for the former Bayshore Railyard site prior to 1990.
5. Concentrations are presented in milligrams per kilogram.
6. Chemical data presented on this map is based on various reports referenced in the text and reflect chemical analysis at different points in time. Lack of a value for a particular sampling location indicates that the soil was not tested for this constituent at this depth interval or that the data is not available in the sources referenced in the text.
7. If more than one value is available for this depth interval, the maximum concentration is presented.

0 200 Feet

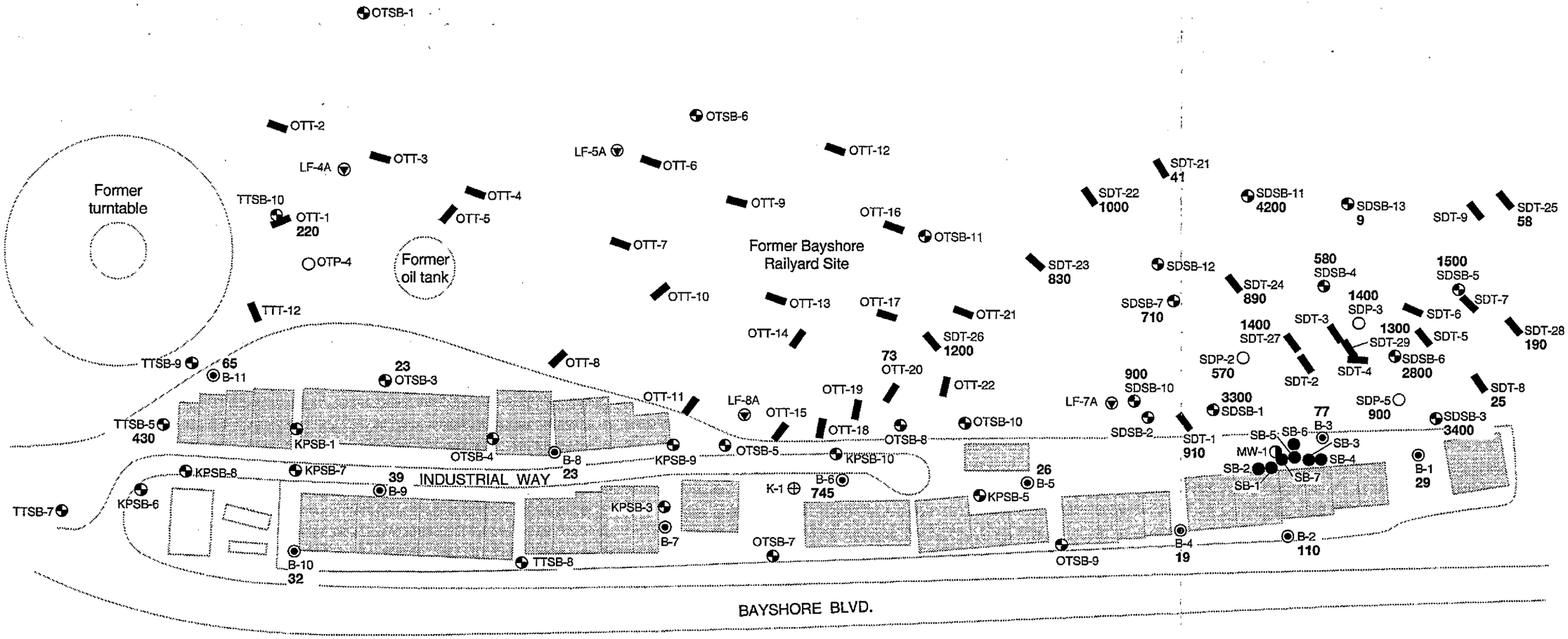
Approximate scale

INDUSTRIAL WAY PROPERTIES
Brisbane, California

LEAD IN SOIL (7.5 TO 16 FEET)

Project No. 1398.02 | Figure 18

TREADWELL & ROLLO, INC.
Consulting Engineers and Scientists



KEY

- Soil boring, B- series (Treadwell & Rollo, Inc., 15 October 1992)
- Groundwater monitoring well, K-1 (Aqua Resources, 30 September 1988)
- Groundwater monitoring well, MW-1 (Geomatrix Consultants, November 1991)
- Soil boring, SB- series (Geomatrix Consultants, November 1991)
- Soil boring, TTSB-; KPSB-; OTSB-; and SDSB- series (Levine•Fricke, 31 July 1990 and 16 October 1992)
- Groundwater monitoring well, LF-series (Levine• Fricke, 16 October 1992)
- Piezometer, SDP- and OTP- series (Levine•Fricke, 16 October 1992)
- Trench, OTT-; TTT-; and SDT- series (Levine•Fricke, 31 July 1990 and 16 October 1992)

Notes:

1. Industrial Way Properties includes 21 through 27, and 55 through 400 Industrial Way.
2. Map is based on Pacific Aerial Surveys photograph no. AV-4075-6-14 dated 2 July 1991.
3. Locations of borings, wells, trenches, and piezometers are approximate.
4. The sampling locations presented exclude data points for the former Bayshore Railyard site prior to 1990.
5. Concentrations are presented in milligrams per kilogram.
6. Chemical data presented on this map is based on various reports referenced in the text and reflect chemical analysis at different points in time. Lack of a value for a particular sampling location indicates that the soil was not tested for this constituent at this depth interval or that the data is not available in the sources referenced in the text.
7. If more than one value is available for this depth interval, the maximum concentration is presented.

0 200 Feet

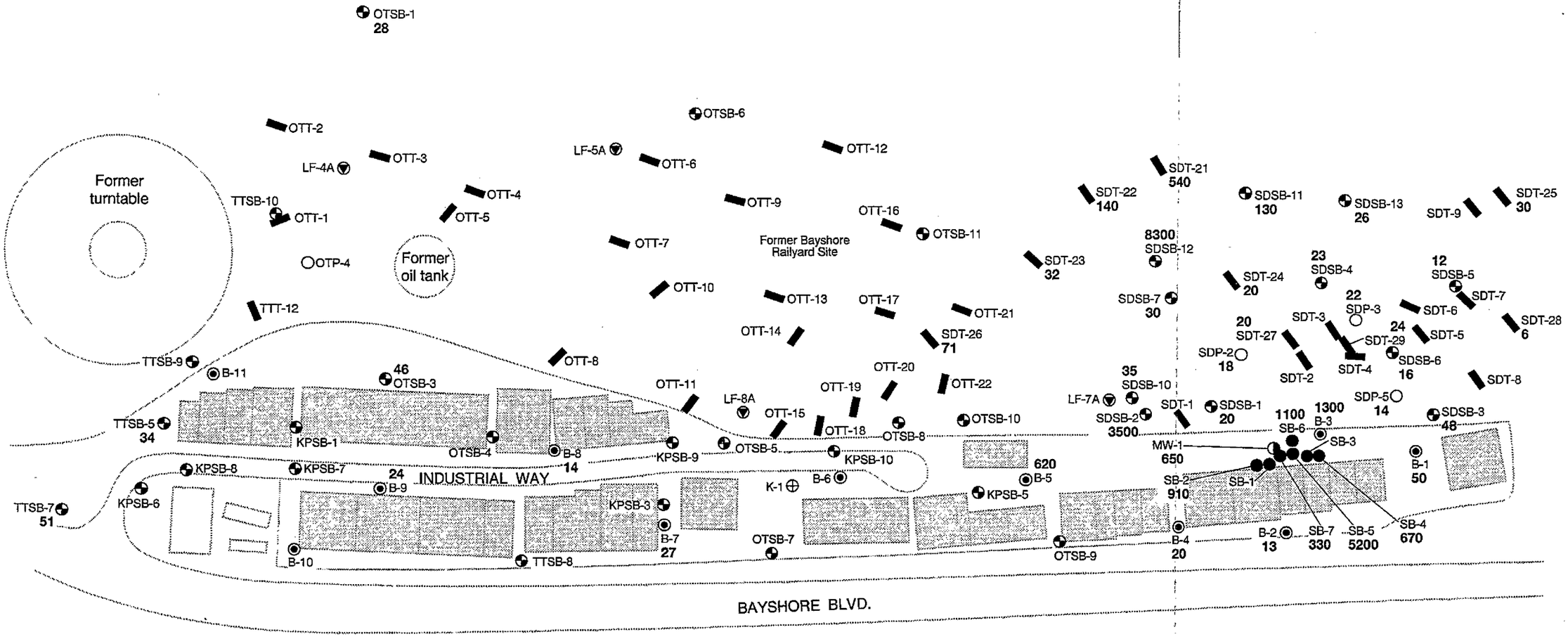
Approximate scale

INDUSTRIAL WAY PROPERTIES
Brisbane, California

COPPER IN SOIL
(0 TO 6 FEET)

Project No. 1398.02 | Figure 19

TREADWELL & ROLLO, INC.
Consulting Engineers and Scientists



KEY

- Soil boring, B- series (Treadwell & Rollo, Inc., 15 October 1992)
- Groundwater monitoring well, K-1 (Aqua Resources, 30 September 1988)
- Groundwater monitoring well, MW-1 (Geomatrix Consultants, November 1991)
- Soil boring, SB- series (Geomatrix Consultants, November 1991)
- Soil boring, TTSB-; KPSB-; OTSB-; and SDSB- series (Levine•Fricke, 31 July 1990 and 16 October 1992)
- Groundwater monitoring well, LF-series (Levine• Fricke, 16 October 1992)
- Piezometer, SDP- and OTP- series (Levine•Fricke, 16 October 1992)
- Trench, OTT-; TTT-; and SDT- series (Levine•Fricke, 31 July 1990 and 16 October 1992)

Notes:

1. Industrial Way Properties includes 21 through 27, and 55 through 400 Industrial Way.
2. Map is based on Pacific Aerial Surveys photograph no. AV-4075-6-14 dated 2 July 1991.
3. Locations of borings, wells, trenches, and piezometers are approximate.
4. The sampling locations presented exclude data points for the former Bayshore Railyard site prior to 1990.
5. Concentrations are presented in milligrams per kilogram.
6. Chemical data presented on this map is based on various reports referenced in the text and reflect chemical analysis at different points in time. Lack of a value for a particular sampling location indicates that the soil was not tested for this constituent at this depth interval or that the data is not available in the sources referenced in the text.
7. If more than one value is available for this depth interval, the maximum concentration is presented.

0 200 Feet

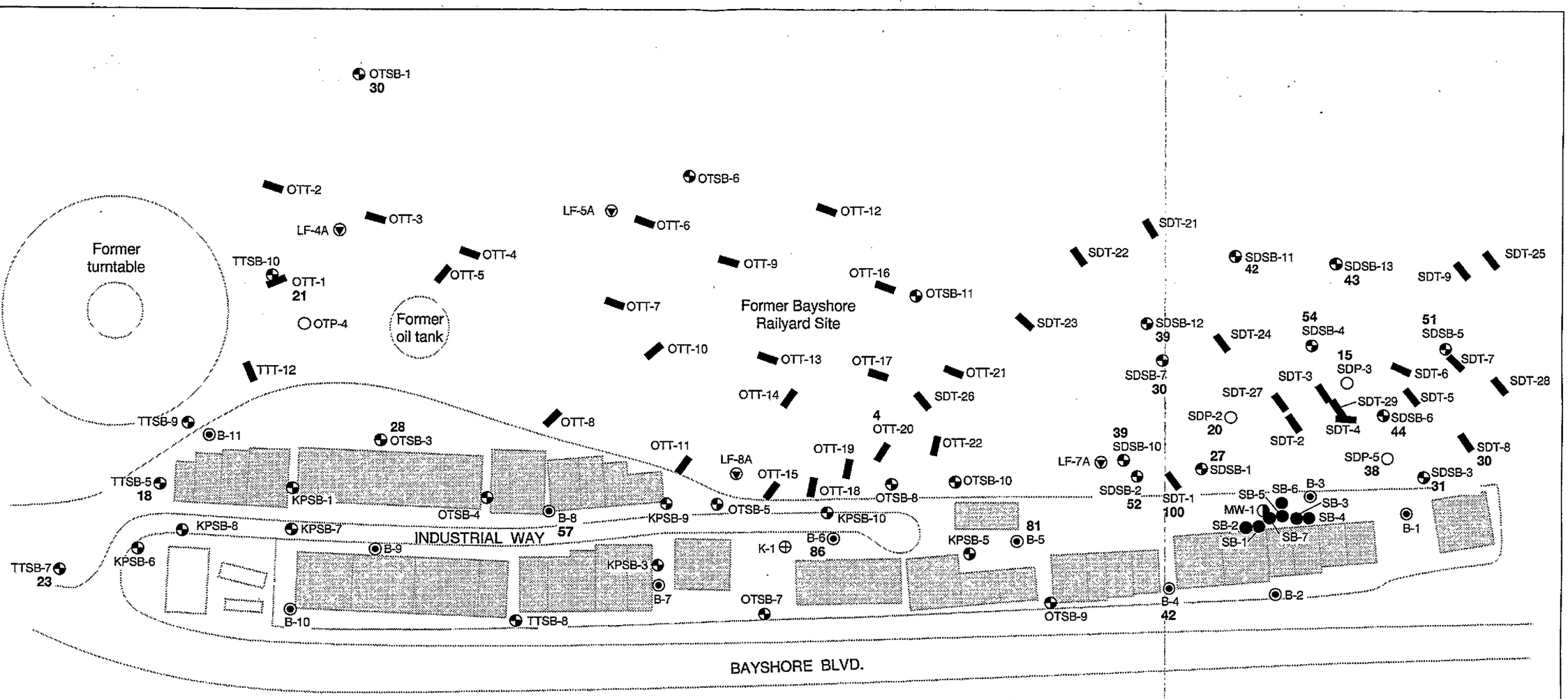
Approximate scale

INDUSTRIAL WAY PROPERTIES
Brisbane, California

COPPER IN SOIL
(7 TO 16 FEET)

Project No. 1398.02 | Figure 20

TREADWELL & ROLLO, INC.
Consulting Engineers and Scientists



KEY

- Soil boring, B- series (Treadwell & Rollo, Inc., 15 October 1992)
- Groundwater monitoring well, K-1 (Aqua Resources, 30 September 1988)
- Groundwater monitoring well, MW-1 (Geomatrix Consultants, November 1991)
- Soil boring, SB- series (Geomatrix Consultants, November 1991)
- Soil boring, TTSB-; KPSB-; OTSB-; and SDSB- series (Levine•Fricke, 31 July 1990 and 16 October 1992)
- Groundwater monitoring well, LF-series (Levine• Fricke, 16 October 1992)
- Piezometer, SDP- and OTP- series (Levine•Fricke, 16 October 1992)
- Trench, OTT-; TTT-; and SDT- series (Levine•Fricke, 31 July 1990 and 16 October 1992)

Notes:

1. Industrial Way Properties includes 21 through 27, and 55 through 400 Industrial Way.
2. Map is based on Pacific Aerial Surveys photograph no. AV-4075-6-14 dated 2 July 1991.
3. Locations of borings, wells, trenches, and piezometers are approximate.
4. The sampling locations presented exclude data points for the former Bayshore Railyard site prior to 1990.
5. Concentrations are presented in milligrams per kilogram.
6. Chemical data presented on this map is based on various reports referenced in the text and reflect chemical analysis at different points in time. Lack of a value for a particular sampling location indicates that the soil was not tested for this constituent at this depth interval or that the data is not available in the sources referenced in the text.
7. If more than one value is available for this depth interval, the maximum concentration is presented.

0 200 Feet

Approximate scale

INDUSTRIAL WAY PROPERTIES
Brisbane, California

CHrOMIUM IN SOIL (0 TO 9 FEET)

Project No. 1398.02 | Figure 21

TREADWELL & ROLLO, INC.
Consulting Engineers and Scientists

TABLES

TABLE 1

SUMMARY OF OWNERSHIP DOCUMENTS
INDUSTRIAL WAY PROPERTIES
BRISBANE, CALIFORNIA

TRANSACTION DATE	DATE RECORDED	DOCUMENT TYPE	FROM	TO
Oct. 25, 1895	Nov. 2, 1895	Indenture	Pacific Bone, Coal and Fertilizing Co.	Southern Pacific Railroad Co.
Jun. 18, 1896	Jul. 7, 1896	Indenture	Mary J. Daniel	Southern Pacific Railroad Co.
Oct. 18, 1890	Dec. 22, 1890	Indenture	Walter Wiley	C.B. Stone
Jan. 2, 1899	Feb. 1, 1899	Indenture	Mary J. Daniel	Walter J. Wiley
Jan. 30, 1899	Jul. 1, 1899	Indenture	L.M. Hoefer	Walter J. Wiley
Nov. 17, 1901	Dec. 30, 1901	Indenture	B.W. Foster	Southern Pacific Railroad Co.
Mar. 21, 1902	Mar. 28, 1902	Indenture	Jessie W. Stone	H.W. Elsert
Apr. 30, 1902	Apr. 30, 1902	Indenture	Edward Samuel Johnson	Manuel Phillips Dutra
Oct. 7, 1902	Oct. 16, 1902	Indenture	Flora D. Jones	John Dougherty
Sep. 16, 1902	Oct. 20, 1902	Indenture	H.W. Elsert	Francis C. Beck
Jul. 26, 1904	Jul. 26, 1904	Indenture	Amanda C. and J.J. Cooks	Southern Pacific Co.
Jun. 29, 1905	Aug. 2, 1906	Indenture	Southern Pacific Railroad Co.	Southern Pacific Co.
Nov. 30 1907	Dec. 31, 1907	Indenture	Henry Umbsen, et al	Gustave H. umbsen
Nov. 30, 1907	Dec. 31, 1907	Indenture	Gustave H. Umbsen	South City Lock Co.
Jan. 5, 1908	Jan. 23, 1910	Indenture	John Dougherty	Francis E. Beck
Oct. 18, 1902	Jan. 25, 1910	Indenture	Francis E. Beck	Southern Pacific Co.
May. 19, 1903	Jan. 25, 1910	Indenture	Francis E. Beck	Southern Pacific Co.
Apr. 7, 1905	Nov. 20 1913	Indenture	Joseph B. and Mabel L. Coryell	Southern Pacific Co.
Apr. 27, 1905	Nov. 20, 1913	Indenture	Samuel and Amy G. Center	Joseph B. Coryell
May.18, 1915	May. 24, 1915	Indenture	Seaboard National Bank of SF	Partridge Realty Co.
May.18, 1915	May.24, 1915	Indenture	Partridge Realty Co.	Seaboard National Bank of SF
Aug. 2, 1915	Aug. 4, 1915	Indenture	Partridge Realty Co.	Pacific Bone Coal & Fertilizing Co.
Dec. 18, 1918	Dec. 24, 1918	Indenture	Seaboard National Bank of SF	Pacific Bone Coal & Fertilizing Co.
Jun. 11, 1919	Jun. 20, 1919	Indenture	Seaboard National Bank of SF	Pacific Bone Coal & Fertilizing Co.
Jan. 14, 1920	Jan. 15, 1920	Indenture	Partridge Realty Co.	Pacific Bone Coal & Fertilizing Co.
Nov. 3, 1920	Dec. 22, 1920	Indenture	Seaboard National Bank of SF	Anglo California Trust Co.
Jul. 14, 1922	Jul. 19, 1922	Indenture	Southern Pacific Co.	Pacific Bone Coal & Fertilizing Co.
Sep. 20, 1922	Sep. 25, 1922	Indenture	Anglo California Trust Co.	Pacific Bone Coal & Fertilizing Co.
Nov. 17, 1928	Nov. 18, 1928	Quitclaim Deed	Partridge Realty Co.	Pacific Bone Coal & Fertilizing Co.
Oct. 4, 1929	Nov. 13, 1929	Indenture	Southern Pacific Co.	Pacific Bone Coal & Fertilizing Co.
Jul. 26, 1929	Nov. 13, 1929	Indenture	Southern Pacific Co.	Pacific Bone Coal & Fertilizing Co.
Aug. 31, 1929	Nov. 13, 1929	Quitclaim Deed	Seaboard National Bank	Pacific Bone Coal & Fertilizing Co.
Feb. 20, 1930	Apr. 7, 1930	Indenture	Southern Pacific Company	Pacific Bone Coal & Fertilizing Co.
Jan. 19, 1934	Mar. 23, 1935	Indenture	J. Wiseman MacDonald	J. Wiseman MacDonald, Jr.
Apr. 1, 1937	Aug. 11, 1937	Deed	Pacific Bone Coal & Fertilizing Co.	Consolidated Chemical Industries, Inc.

TABLE 1

SUMMARY OF OWNERSHIP DOCUMENTS
INDUSTRIAL WAY PROPERTIES
BRISBANE, CALIFORNIA

TRANSACTION DATE	DATE RECORDED	DOCUMENT TYPE	FROM	TO
Dec. 29, 1939	Jan. 2, 1940	Grant Deed	J. Wiseman MacDonald	J. Wiseman MacDonald, Jr.
Apr. 26, 1940	May.2, 1940	Deed	J. Wiseman MacDonald, Jr.	Consolidated Chemical Industries, Inc.
Sep. 18, 1956	Oct. 9, 1956	Deed	Stauffer Chemical Co.	Crocker Estate Co.
Mar. 12, 1963	Mar. 19, 1963	Corp. Grant Deed	Stauffer Chemical Co.	Franciscan Heights, Inc.
Dec. 19, 1963	Dec. 30, 1963	Corp. Grant Deed	Stauffer Chemical Co.	West San Francisco Industrial Park
Jun. 15, 1964	Aug. 10, 1964	Grant Deed	West San Francisco Industrial Park	West San Francisco Industrial Park
Jul. 19, 1966	Jul. 20, 1966	Corp. Grant Deed	Franciscan Heights, Inc.	Kerb, Inc.
Jan. 5, 1967	Jan. 19, 1967	Trustees Deed	Title Insurance & Trust Co.	Stauffer Chemical Co.
Jan. 5, 1967	Jan. 27, 1967	Trustees Deed	Title Insurance & Trust Co.	Stauffer Chemical Co.
Jan. 29, 1968	Feb. 2, 1968	Corp. Grant Deed	Stauffer Chemical Co.	Robert G., S. Douglas, & James P. Tuck; Joseph T. & Paul Stanley
Jan. 31, 1968	Feb. 2, 1968	Quitclaim Deed	Janor Tuck	Robert G. Tuck
Jan. 31, 1968	Feb. 2, 1968	Quitclaim Deed	Nancy Tuck	S. Douglas Tuck
Jan. 31, 1968	Feb. 2, 1968	Quitclaim Deed	Romelda Tuck	James P. Tuck
Jan. 31, 1968	Feb. 2, 1968	Quitclaim Deed	Sylvia Stanley	Joseph T. Stanley
Jan. 31, 1968	Feb. 2, 1968	Quitclaim Deed	Marolyn Stanley	Paul Stanley
Mar. 20, 1973	Apr. 13, 1973	Grant Deed	R.G, S.D., J.P. Tuck & J.T. & Paul Stanley	Southern Pacific Transportation Co.
Mar. 8, 1973	Apr. 13, 1973	Grant Deed	Southern Pacific Transportation Co.	R.G., S.D., & J.P. Tuck & J.T. & Paul Stanley
Sep. 28, 1977	Oct. 6, 1977	Grant Deed	R.G., S.D., J.P. Tuck & J.T. & Paul Stanley	E.S. Ageno, Statewide Security Co., A.H. & L.M. Kessler
Sep. 14, 1988	Sep. 19, 1988	Grant Deed	Albert H. Kessler	Albert H. & Edith T. Kessler
Sep. 20, 1988	Sep. 26, 1988	Grant Deed	Albert H. Kessler & Edith T. Kessler	Albert H. Kessler & Edith T. Kessler
Nov. 1, 1988	Nov. 3, 1988	Corp. Grant Deed	Statewide Security Co.	R.E., G.A., L.E., and D. B. Kessler
Oct. 14, 1988	Nov. 3, 1988	Quitclaim Deed	Elizabeth Kessler	Leland E. Kessler
Nov. 1, 1988	Nov. 3, 1988	Quitclaim Deed	Jan H. Kessler	Randall E. Kessler

Note: Information obtained from First American Title Insurance Company Recorded Document Guarantee, 28 April, 1992.

TABLE 2
SUMMARY OF CURRENT TENANTS
INDUSTRIAL WAY PROPERTIES
BRISBANE, CALIFORNIA

ADDRESS	TENANT	CONTACT	APPROXIMATE DATE OF INITIAL TENANCY
21	PSG MANAGEMENT	BOB JORDAN	-
23	TIGER'S AUTO BODY	CARLOS FLORES	NOVEMBER 1987
25	GONZALEZ ROOFING	JOHN GONZALEZ	1981
27	BAYPORTER EXPRESS	ERNESTO ALVAREZ	MARCH 1991
55	VACANT		-
60	FRIENDSHIP PRINTING	VICTOR TAN	OCTOBER 1990
80	VACANT		-
100	ACME SCENERY	JOSH KORAL OR GREY MCKEE	OCTOBER 1991
130	N.A. SALES	MR. MOCHIZUKI	MARCH 1982
131	GALLANT, INC.	LEN GALLANT	DECEMBER 1990
140-150	N.A. SALES	MR. MOCHIZUKI	MARCH 1982
151	TRI-R-STEEL	JAMES MIRANDA	DECEMBER 1991
161	R & H REPAIR	ALAN ACENAS	PRE-1977
171	ADVANCE CARBON PRODUCTS	WILLIAM CRADER	PRE-1977
180	HUELINE	TODD MAGALINE	1987
190	HUNG CHEUNG RATTAN	ANNIE LEUNG	1985
200	M-F BANK RESTORATION	BOB COXHEAD	JANUARY 1989
250	GRANNY GOOSE	JIM JOHNSON	FEBRUARY 1988
285	C & J FORKLIFT	MR. GRIMES	FEBRUARY 1982
290	SOUND ON STAGE	JERRY PFEFFER	1988
294	CIRCLE BAY TRUCKING	MICHALE COTTON	1991/1992
296	MAXIMUM TECHNOLOGY	ROBERT BOVILL	1985
300	J.P. TRADING	MASAAKI ISOZAKI	1979
304	SIMONDS MACHINERY	CARL HIPP	1973
308-312	R & S ERECTION	DAVE ARRIGHI	1985

TABLE 2
SUMMARY OF CURRENT TENANTS
INDUSTRIAL WAY PROPERTIES
BRISBANE, CALIFORNIA

ADDRESS	TENANT	CONTACT	APPROXIMATE DATE OF INITIAL TENANCY
340	LI CHUNG SANG ENTERPRISES	NEWTON LI	1990
350	DEE ENGINEERING	DAN DEE	1990
362	SOUTHLAND PACKAGING	DON ELMORE	1990
366	REGENCY HOUSE	RICHARD GRIFFITH	1992
370	ACME SCENERY	JOSH KORAL, GREY MCKEE	JUNE 1989
374	L & D TRUCKING	ABEL PEREZ	PRE-1977
400	MOTHER'S COOKIES	CHARLES HAM	1988

TABLE 3
SUMMARY OF HISTORICAL TENANTS
INDUSTRIAL WAY PROPERTIES
BRISBANE, CALIFORNIA

SPACE	TENANT	APPROXIMATE DATES OF TENANCY	OPERATIONS
21+ 23	JOHN P. KEANE, dba PAINT STYLES BY JACK	PRE-1977 - 1982	AUTOBODY PAINT SHOP
	RICHARD D. SANCHEZ	FEBRUARY 1982-JANUARY 1983	AUTOBODY PAINT SHOP
	HERNANDEZ AUTOMOTIVE, ALBERT VALLE & TONY HERNANDEZ	JANUARY 1983 - NOVEMBER 1987	AUTOBODY
25	METAL TRIM	PRE - 1977 - JUNE 1979	METAL FABRICATION AND DISTRIBUTION
27	MCKINNEY MANUFACTURING	PRE - 1977 - APRIL 1982	SHEET METAL PRODUCT ASSEMBLY, SALE & DISTRIBUTION
	MIL-SPEC INDUSTRIES	APRIL 1982 - DECEMBER 1991	SHEET METAL PRODUCT MANUFACTURNG
55	MOORE MANUFACTURING, INC.	MID-1960's - NOVEMBER 1986	PLASTIC HOSE MANUFACTURING
	HORNUNG TRUCKING SERVICE	JUNE 1987 - OCTOBER 1989	TRUCKING COMPANY
	TC TRANSPORATION / TOM CALA	AUGUST 1987 - OCTOBER 1989	TRUCKING COMPANY
60	BRENTON MANUFACTURING	PRE-1977 - 1983	FIRST AID EQUIPMENT SALES
	R. YICK CORPORATION dba MAXIMUM TECHNOLOGY, INC.	SEPTEMBER 1983 - FEBRUARY 1989	FLUORESCENT LIGHTING FIXTURE MANUFACTURING
80	R. YICK CORPORATION dba MAXIMUM TECHNOLOGY, INC.	SEPTEMBER 1983 - MAY 1991	FLUORESCENT LIGHTING FIXTURE MANUFACTURING
	GEORGE SHORT COMPANY	MARCH 1975 - 1982	LIGHT FABRICATION, METAL STAMPING & WAREHOUSING
100	N.A. SALES	1978 - JANUARY 1982	FOOD IMPORT & EXPORT

TABLE 3
SUMMARY OF HISTORICAL TENANTS
INDUSTRIAL WAY PROPERTIES
BRISBANE, CALIFORNIA

SPACE	TENANT	APPROXIMATE DATES OF TENANCY	OPERATIONS
	KATY CHENG, EDDY CHENG & SHUN FOODS CORPORATION	APRIL 1982 - MARCH 1987	FURNITURE & GIFT IMPORT
	HAROLD ARBIT	AUGUST 1987 - SEPTEMBER 1991	WAREHOUSING FURNITURE & ANTIQUES
130	LIBROS, INTERNATIONAL, INC.	FEBRUARY 1978 - MAY 1979	FOOD IMPORT & WAREHOUSING
131	GOLDEN GATE BEVERAGE COMPANY dba BAVA DISTRIBUTING CO.	JANUARY 1978 - 1987	BEVERAGE DISTRIBUTION
	LI CHUNG SANG ENTERPRISES	1987 - DECEMBER 1990	FURNITURE, WAREHOUSING & DISTRIBUTION
140	SAN FRANCISCO SPICE COMPANY	PRE-1977 - APRIL 1978	PACKAGED SPICES
	WESTERN LOOSE LEAF CO.	NOVEMBER 1978 - MARCH 1982	PRINTING & WAREHOUSING
	HINENI MINISTRIES (sublease for portion)	JUNE 1978 - MARCH 1982	PRINTING & WAREHOUSING
150	WESTERN LOOSE LEAF CO.	SEPTEMBER 1971 - MARCH 1982	PRINTING & WAREHOUSING
151	NOMURA & CO, INC.	MARCH 1971 - DECEMBER 1987	FOOD DISTRIBUTION
	RAMON GO & PRODUCER PRICE COMPANY	NOVEMBER 1987 - DECEMBER 1991	FURNITURE & GIFT IMPORT
161	KEITH & SANDRA WISELL, R & H REPAIRS	PRE-1977 - MAY 1987	APPLIANCE REPAIR
171*			
180	SPECTRAVEST, INC. , dba SCARAB	PRE-1977 - 1987	TEXTILE DYEING
190	YKK ZIPPER, USA, INC.	MARCH 1978 - 1982	ZIPPER DISTRIBUTION, REPAIR & SALES

TABLE 3
SUMMARY OF HISTORICAL TENANTS
INDUSTRIAL WAY PROPERTIES
BRISBANE, CALIFORNIA

SPACE	TENANT	APPROXIMATE DATES OF TENANCY	OPERATIONS
	JAMES A. JACKSON - dba UNION PARCEL & DELIVERY MESSENGER SERVICE	1982 - JANUARY 1985	MESSENGER DELIVERY SERVICE
	SUBLEASED ONE-HALF SPACE TO SPECTRAVEST, INC.	1982 - JANUARY 1985	TEXTILE DYEING
200	BEATTY INDUSTRIES, INC.	OCTOBER 1969 - PRE-1977	SCAFFOLD WAREHOUSING, & ERECTION
	SCAFFOLD ENGINEERING	PRE - 1977 - 1985	SCAFFOLD WAREHOUSING & ERECTION
	SPECTRAVEST, INC.	1985 - OCTOBER 1986	FABRIC STORAGE
	NOVA PRESS & DEAN ANDERSON	DECEMBER 1986 - SEPTEMBER 1988	PRINTING PLANT
250	CHECKER VAN & STORAGE	JANUARY 1980 - 1985/JANUARY 1988	FURNITURE MOVING & STORAGE
	GOLDEN GATE PAPER COMPANY AND ELIAS SHAMIAH	FEBRUARY 1986 - MARCH 1988	PAPER & GROCERY BUSINESS
285*			
290	DRATH JACOBS	1980 - 1988	WAREHOUSE ELECTRICAL PARTS AND FIXTURES
	JAMCO	SEPTEMBER 1986 - APRIL 1988	MARINE EQUIPMENT SALES & STORAGE
294	ARTHUR & ALLEN dba SSA CONTRACTING	1976 - 1989	WAREHOUSING OF PARTITION WALLS
	ACME SCENERY COMPANY	JANUARY 1990 - OCTOBER 1991	COMMERCIAL STAGE SETS
296	MOTHER'S COOKIES	1971 - 1985	FOOD DISTRIBUTOR

TABLE 3

SUMMARY OF HISTORICAL TENANTS

INDUSTRIAL WAY PROPERTIES

BRISBANE, CALIFORNIA

SPACE	TENANT	APPROXIMATE DATES OF TENANCY	OPERATIONS
300*			
304*			
308	W. MORANDELL	DECEMBER 1979 - JUNE 1985	IMPORTED WINE & BEER DISTRIBTION
312	N.A. SALES	1976 - DECEMBER 1978	FOOD IMPORT & EXPORT
	W. MORANDELL	APRIL 1983 - JUNE 1985	IMPORTED WINE & BEER DISTRIBUTION
340	TRADE MARK PACKAGING	1977 - 1981/1982	GIFT IMPORT & WAREHOUSE/MANUFACTURED CORRUGATED PAPER BOXES
	MEXIM's	1982 - 1988	FOOD IMPORT
	SATCO	1988 - 1990	LIGHT FIXTURE DISTRIBUTION
350	SATCO	1988 - 1990	LIGHT FIXTURE DISTRIBUTION
362	TRADE MARK PACKAGING SUBLEASED TO UNITED SIGN	1981/1982 - 1989/1990	INSTALLING COMMERCIAL NEON SIGNS
368	TRADE MARK PACKAGING AND AFFILIATE LANDMARK DESIGN	PRE - 1977 - 1981	GIFT IMPORT & WAREHOUSE, MANUFACTURED CORRUGATED PAPER BOXES
	UNITED FLEET	JANUARY 1983 - 1989	GARAGE & TRUCK REPAIR
	RAMON GO, dba PRODUCE PRICE CORPORATION	1989 - 1990	WAREHOUSING

TABLE 3

SUMMARY OF HISTORICAL TENANTS

INDUSTRIAL WAY PROPERTIES

BRISBANE, CALIFORNIA

SPACE	TENANT	APPROXIMATE DATES OF TENANCY	OPERATIONS
	RHONDA MADDEN	1990 - 1992	ANTIQUE AUTOMOBILE STORAGE
370	UNITED FLEET	1981 - 1989	GARAGE & TRUCK REPAIR
374*	RAY & JANICE DIAZ	1977 - 1981	GARAGE
400	GRANNY GOOSE	PRE-1977 - 1988	FOOD DISTRIBUTION

* No information available prior to current tenant.

TABLE 4
LIST OF HISTORICAL AERIAL PHOTOGRAPHS REVIEWED
INDUSTRIAL WAY PROPERTIES
BRISBANE, CALIFORNIA

Date of Photography	Reference No.
1935	AV-248-8-2
29 July 1946	AV-9-10-5
1948	AV-17-10-19
23 April 1959	AV-279-8-19
20 June 1961	AV-432-16-12
1963	AV-550-5-25
14 April 1966	AV-710-6-26
9 April 1968	AV-844-10-34
30 October 1969	AV-933-7-11
10 May 1972	AV-1045-7-14
12 May 1975	AV-1188-6-13
2 June 1977	AV-1356-6-11
2 July 1991	AV-4075-6-14
30 October 1991	AV-4146-2-4

Note: Aerial photographs obtained from Pacific Aerial Surveys, 8407 Edgewater Drive, Oakland, California.

TABLE 5
LIST OF PERSONAL CONTACTS AT TENANT INTERVIEWS
INDUSTRIAL WAY PROPERTIES
BRISBANE, CALIFORNIA

TENANT	PERSONAL CONTACT	PHONE NUMBER
21 Industrial Way PSG Management	Bob Jordan, Owner	(415) 467-2221
23 Industrial Way Tiger's Autobody	Carlos J. Flores, Owner	(415) 467-6866
25 Industrial Way Gonzalez Roofing	John Gonzalez, Owner	(415) 467-6270
27 Industrial Way Bayporter Express	Ernesto Alvarez, Manager	(415) 467-1800
60 Industrial Way Friendship Printing	Victor Tan, Owner	(415) 467-5751
100 Industrial Way Acme Scenery	Gary McKee, Owner	(415) 468-2262
151 Industrial Way Tri-R-Steel	Bob Fernandez, Former Owner (family business)	(415) 468-9086
161 Industrial Way R&H Repair	Alan Acenas	(415) 468-2880
171 Industrial Way Advance Carbon	Bill Crader, Manager	(415) 468-1670
180 Industrial Way Hueline Inc.	Craig Magline, Owner	(415) 467-3513
190 Industrial Way Hung Cheung Rattan	Ann Leung, Manager	(415) 467-6377
200 Industrial Way MF Bank Restor.	Gary Corsiglia, Oper. Mngr.	(415) 468-0400

TENANT	PERSONAL CONTACT	PHONE NUMBER
250 Industrial Way Granny Goose	John	(415) 467-0959
285 Industrial Way C&J Forklift	Chuck Grimes, Oper. Mngr.	(415) 467-8415
290 Industrial Way Sound on Stage	Bob Walker, Manager	(415) 468-2990
296 Industrial Way Young's Generator	Randall Venerable	(415) 468-2868
304 Industrial Way Simonds Machinery	Steve Hipp, Gen. Mngr.	(415) 468-4830
308 Industrial Way R&S Erection	Dave Arrighi, Gen. Mngr.	(415) 467-5630
340 Industrial Way Li Chung Sang Ent.	Newton Lee, Owner	(415) 468-2120
350 Industrial Way Dee Engineering	Daniel Dee, Manager	(415) 467-7727
374 Industrial Way L&D Trucking	Abel Perez, Manager	(415) 467-7290

TABLE 6

SUMMARY
UNDERGROUND STORAGE TANK REMOVAL
INDUSTRIAL WAY PROPERTIES
BRISBANE, CALIFORNIA

LOCATION OF FORMER TANK	TANK VOLUME	TANK CONTENTS	REMOVAL DATE	REMOVAL CONTRACTOR	SAMPLE DATA/REMOVAL ACTIONS	FURTHER ACTION
250 Industrial Way	500 gal.	Gasoline	Apr-88	Interstate Paving & Grading	Pit water -BTEX up to 0.92 mg/l TPHg up to 9.4 mg/l; no soil sample data available	Installation of K-1 9/8/88 by Aqua Resources
285 Industrial Way	2,000 gal.	Leaded gasoline Diesel	Apr-91	Trumpp Brothers	Excavated 15 cubic yards tank backfill and 15 cubic yards soil; tank in good condition; no holes Sand backfill, sidewall soil, & tank pit water samples ND for TPH/BTEX; TPH contamination below groundwater due to Bunker C oil from Bayshore Railyard	None taken
350 Industrial Way	1,000 gal.	Gasoline	Feb-91	Trumpp Brothers	Excavated 20 cubic yards soil; Tank empty at removal; 1/2-in hole at north end of tank; Stockpiled soil from excavation; reportedly used for fill at 55 Industrial Way after aeration and sampling; TPHd in soil up to 4,900 mg/kg BTEX in soil up to 160 mg/kg Lead in soil up to 0.45 mg/l (STLC)	Installation of MW-1 11/91 Soil borings SB-Series

Note: The available information on the tank removals is presented in Appendix B.

TABLE 7
LIST OF CHEMICALS USED ONSITE
INDUSTRIAL WAY PROPERTIES
BRISBANE, CALIFORNIA

HISTORICAL

Caustic (sodium hydroxide)
Chromium
Diesel fuel
Gasoline
Hydrogen peroxide
Homopolymer resin (Moore Manufacturing)
Santobrite (Monsanto product)
Sulfuric acid
Calcium sulfate
Zinc sulfate

CURRENT

Acetic acid
Acetone
Acetylene gas
Adhesive
Antifreeze
Argon gas
Dyes
Dipentene
Gasoline (drums)
Hydraulic fluid
Hydrogen peroxide
Isopropyl alcohol
Motor oil
Paint and wood stains
Printer's inks & fixing agents
Propane
Rust and scale remover
Sodium Formaldehydesulfoxylate
Sodium Hexametaphosphate
Sodium hydrosulfite
Sodium hydroxide
Sodium hypochlorite
Thinners
Transmission fluid
Triethanolamine
Various solvents

Note: 1. Current use of chemicals generally involves small quantities that appear to be properly used, stored, and disposed or recycled.

2. List of chemicals used historically was obtained from Department of Toxic Substance Control files.

3. Available information on these chemicals is presented in Appendix C.

TABLE 8
REFERENCES
BAYSHORE RAILYARD INVESTIGATIONS

Ecology and Environment, Inc. (E&E). 1984. Plan for soil and groundwater investigation, Southern Pacific Transportation Company Bayshore Railroad Yard, Brisbane, California. February.

--------. 1985. Soil and groundwater investigation of the Southern Pacific Transportation Company Bayshore Railyard, Brisbane, California. January.

Harding Lawson Associates. 1982. Environmental assessment of fill, former railroad yard, Brisbane, California. June.

Hydrologic Consultants. Inc. (HCI). 1989a. Remedial investigation data study report. Prepared for Southern Pacific Transportation Company, Bayshore Facility, Brisbane, California. May 16.

--------. 1989b. Draft workplan, supplemental remedial investigation, Southern Pacific Transportation Company, Bayshore Railyard, Brisbane, California. October 26.

Levine•Fricke, Inc. 1992. Draft, Remedial Action Plan, Bayshore Railyard, Brisbane, California, October 16.

--------. 1990a. Supplemental Remedial Investigation Data Study Report, The Bayshore Railyard, Brisbane, California, July 31.

--------. 1990b. Appendix G, public health and environmental evaluation, supplemental remedial investigation data study report, The Bayshore Railyard, Brisbane, California. December 3, 1990.

--------. 1991a. Quarterly summary report of technical and engineering activities for the period October 1 through December 31, 1990, Bayshore Railyard, Brisbane, California.

--------. 1991b. Proposed groundwater monitoring program at the Bayshore Railyard Brisbane, California. January 18.

--------. 1991c. Feasibility study report, Bayshore Railyard, Brisbane, California. December 1.

The Mark Group. 1986. Remedial action alternative feasibility study, Volumes I, IIA, and IIB. Prepared for Southern Pacific Transportation Co., Bayshore Facility, Brisbane, California. September 23.

TABLE 9
SUMMARY OF INSURANCE
BRISBANE INDUSTRIAL PARK

COMPANY	POLICY	BROKER	YEAR
Transamerica	31332003 XLB89730098	R.B.H.	1992-1993
Transamerica	30873929 XLB2759006	R.B.H.	1991-1992
Transamerica	30873828 XLB13322915	R.B.H.	1990-1991
Transamerica Scottsdale (Moore)	NBBPP0815646 GLS344543	Bobba Bobba	1989-1990
Transamerica	Unavailable	R.B.H.	1988-1989
Firemans Fund	XXK1907701 BPP0816646	Bobba	1987-1988
Transamerica	SP05500064	R.B.H.	1986-1987
Transamerica	19347486	R.B.H.	1985-1986
Industrial Indemnity	SP8671559	HL&H	1983-1984
Industrial Indemnity	Unavailable	HL&H	1982-1983
Industrial Indemnity	Unavailable	HL&H	1981-1982
Firemans Fund	NC593807	Bender	1980-1981
Great American	BP1205454	Bender	1979-1980
Great American	PRO1051742	Bender	1978-1979

Brokers:
R.B.H. - Rollins Burdick Hunter (now Rollins Hudig Hall) Portland, OR
Bobba - Bobba Insurance (now Arthur Gallagher) Pleasanton, CA
HL&H - Heller, Lach & Hart - Alameda, CA
Bender - Albert Bender - San Francisco, CA

APPENDIX A
VISTA Certification Letter
28 February 1993



RECEIVED
FEB 2 6 1993
TREADWELL & ROLLO

February 23, 1993

MARIE HEDBERG
TREADWELL AND ROLLO
353 SACRAMENTO ST STE 800
SAN FRANCISCO, CA 94111

Dear MARIE HEDBERG,

A SANBORN MAP-SITE SEARCH was conducted on the following address:

Name/Ref#: KESSLER

Address: 10-380 INDUSTRIAL WAY
City/St/Zip: BRISBANE, CA 94005

Vista Order#: 1347001

SANBORN certifies that a search was made of their holdings and no SANBORN MAPS are available. VISTA has this letter of certification on file. The charge for the search will be sent on a separate invoice. Your use of VISTA for this service is greatly appreciated.

Document Retrieval Service
VISTA ENVIRONMENTAL INFORMATION, INC.

APPENDIX B
Underground Storage Tank Removal Reports

aqua resources inc.

2030 Addison Street, Suite 500 • Berkeley, California 94704 • 415 540-6954

September 30, 1988

Mr. Leslie Kessler
Kessler and Kessler
520 Sixteenth Street
Oakland, CA 94612

88192.1

Subject: Monitoring Well Installation
256 Industrial Way
Brisbane Industrial Park
Brisbane, CA

Dear Mr. Kessler:

Introduction

At your request, Aqua Resources Inc. (ARI) installed a groundwater monitoring well at the subject site. The monitoring well installation was required by the County of San Mateo Department of Health Services, Public Health Division - Environmental Health pursuant to their letter dated August 4, 1988. The purpose of the monitoring well is to determine whether the previous underground fuel storage tank had leaked, causing contamination of the shallow groundwater at this site. Prior to the installation of this monitoring well, the underground fuel storage tank had been removed, the excavation backfilled and the area paved. The original tank location was determined based on photographs of the completed excavation provided by you.

The August 4, 1988 letter referenced above also directed that a short letter/report, addressing the monitoring well installation, sampling, and analyses, be prepared. This letter/report includes a description of the well installation and sampling, a copy of the drafted well log, copies of the chain of custody and certified chemical analysis reports, and a copy of the approved monitoring well permit. The above referenced letter also states that assessment of the data will be performed by the County Environmental Health staff to determine whether potential health risks associated with subsurface contamination are present.

Our services as per our agreement consisted of:

- o performing site reconnaissance to determine the monitoring well location;
- o collecting soil samples and logging of soil units at a groundwater monitoring well located downgradient of the previously removed underground tank location;
- o overseeing monitoring well installation, in accordance with San Mateo County requirements;
- o developing the groundwater monitoring well and measuring the groundwater elevation;
- o collecting one groundwater sample;
- o coordinating with the analytical laboratory for analyses of soil and groundwater samples;
- o report preparation.

This report summarizes the monitoring well installation procedures and chemical analyses results, preformed as part of ARI's Scope of Services.

Monitoring Well Installation Procedure

Prior to installation of the monitoring well, a site reconnaissance was performed to determine the monitoring well location. At the time the site reconnaissance was performed, the tank excavation had been backfilled and the area paved. The monitoring well was located within 10 feet of the backfilled tank excavation based on interpretation of photographs, provided to ARI, showing the completed tank excavation in relation to existing surface features. The downgradient direction was determined by visual observation, and engineering and geologic judgement.

On September 8, 1988, one groundwater monitoring well was installed at the site by ENSCO Environmental Services of Fremont, using a Mobile B-36 drill rig equipped with an eight-inch diameter hollow stem auger. The monitoring well location is shown on the attached monitoring well permit. Augers were steam cleaned prior to drilling. A standard split barrel sampler, with a 2-5/8 inch outer diameter and 2 inch inner diameter, was used for soil sampling. The sampler has the capacity for obtaining an 18-inch sample using three six-inch long brass liners. Prior to obtaining each sample, the disassembled sampler and the brass liners were washed in a solution of TSP in water. Each piece was triple rinsed, with the final rinse being distilled water.

A boring log was prepared for the well in the field. Blow counts were recorded for each six inches of penetration of the sampler, and the time at which each sample was taken was noted on the log. Soil samples were collected at five-foot intervals during the drilling of the well. The soil exposed in the ends of the tube was quickly noted, and the ends were then sealed with aluminum foil and new snug-fitting plastic caps. The edges of the caps were sealed with plastic tape. The cap was labeled with the sample number, depth, date, and project name. A second sample was taken from each five-foot interval to be reserved for inspection if needed at a later date. The third sample was used for the sample description.

The soil samples were placed in a chilled ice chest as they were collected. Soil samples located above the free groundwater level were submitted for chemical analyses, while samples obtained below the free groundwater level were held pending results of the chemical analyses.

The monitoring well was installed at the conclusion of soil sampling. The monitoring wells casing consisted of two-inch diameter Schedule 40 PVC pipe. The bottom of the well casing was closed with a screw-on cap. The well casing was slotted (slot opening 0.020 inches) between depths of 7 feet and 27 feet. The annul us space between the casing and bore wall was filled with #2/12 sand to a depth of 5 feet below existing grade (about two feet above the top of slotted casing). A one foot seal of bentonite pallets was constructed immediately above the sand pack, and the remainder of the annulus was filled with cement grout. The top of the well casing was filled

with a locking cap. Because the monitoring well is located in a paved area, the well head was constructed within a cristy box. The cristy box was completed to reduce the potential for surface water runoff from ponding around the well head.

On September 12, 1988, the groundwater depth was measured to the top of the casing in the well, to the nearest hundredth of a foot, using an electronic interface probe. The well was developed by evacuating approximately 20 gallons of water from this well, using a three-foot teflon bailer. After the well was developed and allowed to recover, a groundwater sample was collected (on September 13, 1988) using the bailer. Prior to developing the well, and again before collection of the groundwater sample, the bailer was cleaned in a solution of TSP in water, rinsed with tap water, and given a final rinse with distilled water. A new length of nylon rope was used for lowering and raising the bailer. The first sample from the well was retrieved from the surface of the water, and the contents of the bailer were observed to assess whether there was substantial floating product present. The sample vials and jars, provided by the laboratory, were filled from the bailer. The sample vials were placed in a chilled ice chest and transported to the laboratory under chain-of-custody control.

Site Condition Summary

The site is currently paved and used for automobile parking and vehicle access for the adjacent commercial building. Except where directed to existing catch basins, surface drainage is generally to the northeast to existing roadway improvements (Industrial Way).

During the boring for the monitoring well, asphalt concrete was encountered and was underlain by baserock that in turn was underlain by about 6-inches of concrete. The concrete appears to be underlain by sandy clay fill to depths of between three to four feet. The fill is underlain to the depth explored (27 feet) with native soils consisting of interbedded sandy clay, silty clay, and clay. A slight hydrocarbon odor was noted in the soil sample obtained at a depth of about 5 feet, and in the auger cuttings between depths of 7 and 8 feet.

No hydrocarbon odors were noted below depths of about 8 feet. Due to the soft consistency of native clays, no soil samples were recovered at sampling intervals performed at depths of 13 feet and 18 feet.

Free groundwater was first observed during drilling at a depth of about 8 feet. Prior to bailing (3 days after well completion) the free groundwater level was observed at a depth of 4.77 feet. The water level at the time of groundwater sample collection was 4.88 feet. Floating product was not observed in the bailer when the first water sample was retrieved; however, the upper portion of this sample was observed to have a different color than the lower portion.

Laboratory Results

As discussed earlier, soil and groundwater samples selected for chemical analysis were submitted to a State certified laboratory utilizing chain of custody protocols. Chemical analyses were performed by Curtis and Tompkins, Ltd, Analytical Laboratories in Berkeley. Chemical analysis, pursuant to the previously referenced August 4, 1988 letter, included determination of Total Petroleum Hydrocarbons, Benzene, Toluene, Xylene, Ethyl-benzene, Tetraethyl Lead, and Ethylene Dibromide. Results of the chemical analyses are presented on the attached certified laboratory reports.

Conclusions and limitations

Based on the analyses of the soil and groundwater samples collected from the monitoring well, there does not appear to be significant hydrocarbon contamination associated with the underground tank that was removed. Review of the chemical test results indicate that all analytes were below the method detection limits for the soil sample. Similarly, all analytes, except for Benzene, Toluene and Xylene, were also below the method detection limits for the water sample.

The reported concentration limits for Toluene and Total Xylenes are below the Action Levels established by the State Department of Health Services (DHS). The reported Benzene concentration of 15 ug/l is well above the Action Level of 700 ng/l, and in consequence, it may be a source of

concern. However, surface groundwater under the site is reportedly not used for domestic purposes at the site or its vicinity, and there does not appear to be any significant path of exposure concerning human or animal receptors. Action levels are applied within the DHS "decision tree" framework, and factors such as beneficial use of groundwater and population at risk are usually taken into consideration to determine if further action would be required.

Regional Water Quality Control Board Designated Level to Protect Groundwater is 70 ug/l for Benzene in a liquid. The concentration found at the site (15 ug/l) is below this level, indicating that the groundwater sampled at the site does not necessarily constitute a source of contamination for neighboring aquifers.

Our investigation, per our mutual agreement, was limited to the installation of one groundwater monitoring well, sample collection. Chemical analyses were ordered by the San Pablo County and performed by others, not under our supervision. Test results are reported as received. Final determination of additional site remediation, if required, will be determined by the San Mateo County Public Health Department. We cannot guarantee or warrant that soil or groundwater at this site are not contaminated above allowable limits for a given contaminant. This report is limited in its scope to the analyses and review of samples obtained from the one monitoring well as required by the regulatory agency.

It has been a pleasure to provide you with this information. If you have any questions regarding the above, please do not hesitate to contact the undersigned.

Respectively submitted
AQUA RESOURCES INC.

Fatima Lelic

Mark Milani, P.E.
Project Manager

cc: Addressee (4)

Attachments: Approved Well Permit
Log of Boring/Monitoring Well
Certified Laboratory Reports
Chain of Custody Form

STATE OF CALIFORNIA
THE RESOURCES AGENCY
DEPARTMENT OF WATER RESOURCES

WATER WELL DRILLERS REPORT

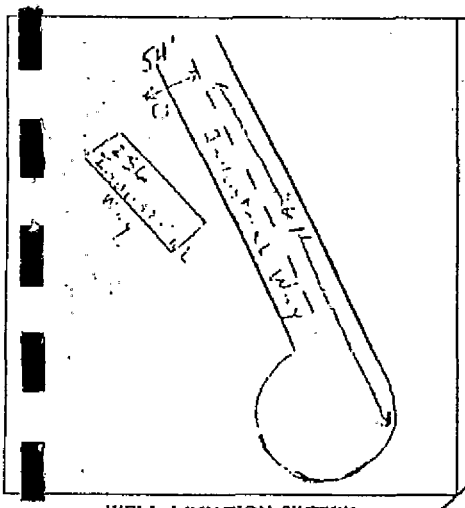
Do not fill in
No. 295131

e of Intent No. _____
ical Permit No. or Date _____

State Well No. _____
Other Well No. _____

(1) OWNER: Name Kessler & Kessler
Address 520 16th Street
City Oakland ZIP 94612

(2) LOCATION OF WELL (See instructions):
County San Mateo Owner's Well Number W-1
Well address if different from above 256 Industrial, Brisbane
Township _____ Range _____ Section _____
Distance from cities, roads, railroads, fences, etc. _____



WELL LOCATION SKETCH

(3) TYPE OF WORK:
New Well [X] Deepening [ ]
Reconstruction [ ]
Reconditioning [ ]
Horizontal Well [ ]
Destruction [ ] (Describe destruction materials and procedures in Item 12)

(4) PROPOSED USE:
Domestic [ ]
Irrigation [ ]
Industrial [ ]
Test Well [X]
Municipal [ ]
Other [ ]
(Describe)

(5) EQUIPMENT:
Rotary [X] Reverse [ ]
Cable [ ] Air [ ]
Other [ ] Bucket [ ]

(6) GRAVEL PACK:
Yes [X] No [ ] Size #2/12 sand
Diameter of bore 8 inches
Packed from 5 ft. to 27 ft.

(7) CASING INSTALLED:
Steel [ ] Plastic [X] Concrete [ ]

(8) PERFORATIONS:
Type of perforation or size of screen slotted .020

From ft.	To ft.	Dia. in.	Gage or Wall	From ft.	To ft.	Slot size
½'	27'	2"	schedule 40	7'	27'	.020

(9) WELL SEAL:
Was surface sanitary seal provided? Yes [X] No [ ] If yes, to depth 5' ft.
Was strata sealed against pollution? Yes [X] No [ ] Interval 3/4-5' ft.
Method of sealing 1' bentonite, remainder cement

(10) WATER LEVELS:
Depth of first water, if known unknown ft.
Static water level after well completion 4.87 ft.

(11) WELL TESTS:
Was well test made? Yes [ ] No [X] If yes, by whom? _____
Type of test Pump [ ] Bailer [ ] Air lift [ ]
Depth to water at start of test _____ ft. At end of test _____ ft.
Discharge _____ gal/min after _____ hours Water temperature _____
Chemical analysis made? Yes [X] No [ ] If yes, by whom? Aqua Resources
Was electric log made Yes [ ] No [X] If yes, attach copy to this report

(12) WELL LOG: Total depth 27 ft. Completed depth 27 ft.

from ft.	to	ft.	Formation (Describe by color, character, size or material)
0"	–	2"	asphalt
2"	–	8'	sandy clay
8'	–	12'	clay (1/32" of black carbon at 8')
12	–	16	sandy clay
16	–	21	silty clay, gray
21	–	27	silty clay, brown

Work started 9/8 19 88 Completed 9/8 19 88

WELL DRILLER'S STATEMENT:
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.
Signed _____ (Well Driller)
NAME ENSCO (Person, firm, or corporation) (Typed or printed)
Address 41638 Christy Street
City Fremont ZIP 94538
License No. 464324 550205 Date of this report 4-26-87

COPY NOT FOR PUBLIC USE
WATER CODE SEC. 13752
NOT OFFICIAL

STATE OF CALIFORNIA
THE RESOURCES AGENCY
DEPARTMENT OF WATER RESOURCES

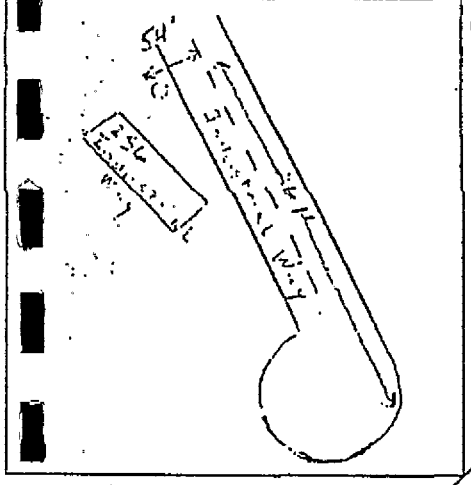
WATER WELL DRILLERS REPORT

Do not fill in No. 295131

e of Intent No. _____ State Well No. _____
ocal Permit No. or Date _____ Other Well No. _____

(1) OWNER: Name Kessler & Kessler
Address 520 16th Street
City Oakland ZIP 94612

(2) LOCATION OF WELL (See instructions):
County San Mateo Owner's Well Number W-1
Well address if different from above 256 Industrial, Brisbane
Township _____ Range _____ Section _____
Distance from cities, roads, railroads, fences, etc. _____



WELL LOCATION SKETCH

(3) TYPE OF WORK:
New Well [X] Deepening [ ]
Reconstruction [ ]
Reconditioning [ ]
Horizontal Well [ ]
Destruction [ ] (Describe destruction materials and procedures in Item 12)

(4) PROPOSED USE:
Domestic [ ]
Irrigation [ ]
Industrial [ ]
Test Well [X]
Municipal [ ]
Other [ ]
(Describe)

(5) EQUIPMENT:
Rotary [X] Reverse [ ]
Cable [ ] Air [ ]
Other [ ] Bucket [ ]

(6) GRAVEL PACK:
Yes [X] No [ ] Size #2/12 sand
Diameter of bore 8 inches
Packed from 5 ft. to 27 ft.

(7) CASING INSTALLED:
Steel [ ] Plastic [X] Concrete [ ]

(8) PERFORATIONS:
Type of perforation or size of screen slotted .020

From ft.	To ft.	Dia. in.	Gage or Wall	From ft.	To ft.	Slot size
1'	27'	2"	schedule 40	7'	27'	.020

(9) WELL SEAL:
Was surface sanitary seal provided? Yes [X] No [ ] If yes, to depth 5' ft.
Were strata sealed against pollution? Yes [X] No [ ] Interval 3/4-5' ft.
Method of sealing 1' bentonite, remainder cement

(10) WATER LEVELS:
Depth of first water, if known unknown ft.
Static water level after well completion 4.87 ft.

(11) WELL TESTS:
Was well test made? Yes [ ] No [X] If yes, by whom? _____
Type of test Pump [ ] Bailer [ ] Air lift [ ]
Depth to water at start of test _____ ft. At end of test _____ ft.
Discharge _____ gal/min after _____ hours Water temperature _____
Chemical analysis made? Yes [X] No [ ] If yes, by whom? Aqua Resources
Was electric log made Yes [ ] No [X] If yes, attach copy to this report

(12) WELL LOG: Total depth 27 ft. Completed depth 27 ft.

from ft.	to ft.	Formation (Describe by color, character, size or material)
0"	2"	asphalt
2"	8'	sandy clay
8'	12'	clay (1/32" of black carbon at 8')
12	16	sandy clay
16	21	silty clay, gray
21	27	silty clay, brown

Work started 9/8 19 88 Completed 9/8 19 88

WELL DRILLER'S STATEMENT:
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.
Signed _____ (Well Driller)
NAME ENSCO (Person, firm, or corporation) (Typed or printed)
Address 41638 Christy Street
City Fremont ZIP 94538
License No. 464324 550205 Date of this report 4-26-89

OWR 188 (REV. 12-88) IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM 86 96355

COPY
NOT FOR PUBLIC USE
WITHHELD PER WIC CODE SEC. 13752
INITIAL

OFFICE OF ENVIRONMENTAL HEALTH
SAN MATEO COUNTY DEPARTMENT OF HEALTH SERVICES

WELL CONSTRUCTION APPLICATION

COUNTY GOVERNMENT CENTER
590 HAMILTON STREET
REDWOOD CITY, CALIF. 94063
(415) 363-4305

RECEIVED SEP 0 6 1988

DATE
PERMIT ISSUED
PERMIT NO.
FEE: 150
RECEIPT NO. 000103
ASSIGNED TO: EM
SO

TO BE COMPLETED BY OWNER AND DRILLER

Owner:	Well Owner (if different):	Drilling Co.:
sler & Kessler	Kessler & Kessler	ENSCO
ss:	Address of Well Site:	Driller's Contractor's License Number:
xteenth Street	256 Industrial Way	464324
State, Zip:	City, State, Zip:	Address:
land, CA 94612	Brisbane, CA	41638 Christy Street
ne No.:	Telephone No.:	City, State, Zip:
5) 836-4848		Fremont, CA 94538
ssor's Parcel No. of Well Site:	Owner's /Consultant's Well No.:	Telephone No.:
-011-010	MW-1	(415) 659-0404

Estimate depth of completed well: [X] Less than 50 feet [ ] 50 to 300 feet [ ] Over 300 feet

Purpose of Well: [ ] Domestic [ ] Municipal/Industrial [ ] Agricultural * [X] Monitoring [ ] Cathodic Protection

* Monitoring wells are those constructed for the purpose of obtaining repetitive water level measurements and/or repetitive water samples for analyses. This includes wells constructed for general exploration and investigation purposes as well as those to be constructed in conformance with the Hazardous Materials Storage Permit Ordinance for site-specific groundwater monitoring of existing underground hazardous materials storage tanks.

THIS SECTION TO BE COMPLETED IF THIS APPLICATION IS FOR A MONITORING WELL

Purpose of Monitoring Well: [ ] To comply with City or County Hazardous Materials Ordinance [X] Exploration studies
[X] Other (specify): As required by San Mateo County Dept. of Env. Health

Name of Business: Brisbane Industrial Park Business License No.: 003548 Exp. 12/31/88

If proposed well is to meet compliance with a Hazardous Materials Storage Permit Ordinance has the City or County been contacted? [X] Yes [ ] No

Brisbane
If yes, give name of City or County

Aqua Resources Incorporated
Consultant's Name (company)

2030 Addison Street, Ste 500
Address

Berkeley, CA 94704
City, State, Zip

(415) 540-6954
Area Code Telephone No.

Type of monitoring device: [X] Groundwater [ ] Vadose
Monitoring well use: [ ] Depth [ ] Quality
[X] Depth and Quality
Vadose device installation: [ ] Vapor [ ] Interface
[ ] Suction Lysimeter

SIGNATURE OF RESPONSIBLE PROFESSIONAL

CE 35120 Exp. 9/30/91
REGISTRATION NO. CIVIL ENGINEER — OR — CERTIFICATE NO. ENGINEERING GEOLOGIST

TOPOGRAPHIC FEATURES

Is well to be constructed: [ ] In a public sidewalk [ ] In a public road [ ] On public property [X] On private property

Within 50 feet of the top of a creek bank [ ] Yes [X] No
Within 50 feet of a sanitary sewer or lateral. [X] Yes [ ] No
Within 100 feet of a pit privy, septic tank, leachfield [ ] Yes [X] No
Within 50 feet of any existing well [ ] Yes [X] No

LOCAL AUTHORIZATION MUST
BE OBTAINED
CONTACT FIRE OR BUILDING AUTHORITY

CERTIFICATION BY WELL OWNER/AGENT AND DRILLER/AGENT:

I certify that the information given above is correct to the best of my knowledge. I certify that the well will be constructed in compliance with the conditions of this permit, the San Mateo Co. Ordinance, and, if applicable, the Hazardous Materials Storage Permit Ordinance of the County of San Mateo. It is my responsibility as the well owner to notify the County of any changes in the purpose of this well from that which is indicated on this application form.

WELL OWNER/AGENT DATE

[ ] I certify that in the performance of the work for which this permit is being issued I shall not employ any person in any manner so as to become subject to the Workmen's Compensation laws of California.
[X] I certify that I have a valid Workmen's Compensation Coverage.

LAW OFFICES OF
KESSLER & KESSLER
A PROFESSIONAL CORPORATION
520-16TH STREET
OAKLAND, CALIFORNIA 94612
(415) 836-4848
FAX 836-1066

LESLIE M. KESSLER
RANDALL E. KESSLER

ALBERT H. KESSLER
(RETIRED)

May 15, 1989

Department of Health Services
Public Health Division
County of San Mateo
590 Hamilton Street
Redwood City, CA 94063

ATTENTION: Zohreh Pierow Salehi

Subject: 56SM0006, 250 Industrial Way, Brisbane, CA

Dear Ms. Salehi:

Following up your letter to us dated March 17, 1989, we engaged Kennedy/Jenks/Chilton to do an analysis of a water sample taken from the monitor well installed on this property.

I am writing this letter to comply with your letter to us of March 17th.

Originally and in April of 1988, we applied to San Mateo County for a permit to abandon an underground storage tank (gasoline tank). The contractor removing the tank was Interstate Grading and Paving, Inc. The soils tester as set forth in the building permit was Accu-tight Testing.

The tank was removed, and an analysis report was received from Anresco dated April 11, 1988, a copy of which is enclosed herewith. The pit was left opened, and in May another water sample was taken. A report was made by Anresco dated June 7, 1988, copy of which is enclosed. You were furnished with copies of both such analysis reports almost immediately after they were obtained.

By letter of August 4, 1988, you ordered a monitor well be installed and you were furnished with information concerning the installation thereof.

No tests have been made since installation of said monitor well.

As you have previously been informed, there is no residence within approximately a mile of this location. On the east side is located large tract of Southern Pacific property.

This entire area is filled in land and tide water land. There are no wells in this whole area which can be used for human consumption.

Enclosed herewith find copy of water analysis report received this date from the Kennedy/Jenks/Chilton, Laboratory Division. We are advised by Mr. Gregg Bryden of such laboratory that the symbols UG/L are symbols for micrograms per liter; and that such symbol is somewhat comparable to parts per billion.

At any rate, I enclose herewith four sheets of lab analysis (numbers 893045 and 893046). These reports are all signed by the lab.

I have attached my declaration under penalty of perjury. Please advise whether you need such declaration from Kennedy/ Jenks/Chilton as to their report.

I have not submitted a copy of this report to the RWQCB since I do not know their address.

Yours very truly,

KESSLER & KESSLER

Leslie M. Kessler

LMK:lfh

Enclosures

I declare under penalty of perjury that the information contained in the foregoing report is true and correct.

_____

LESLIE M. KESSLER

RECEIVED
OCT 2 2 1992
TREADWELL & ROLLO

GEOMATRIX

UNDERGROUND STORAGE TANK REMOVAL

285 Industrial Way
Brisbane, California

Prepared for

Kessler and Kessler
520 16th Street
Oakland, California

17 June 1991
Project No. 1790.03

Geomatrix Consultants

One Market Plaza
Spear Street Tower, Suite 717
San Francisco, CA 94105
(415) 957-9557

GEOMATRIX

17 June 1991
1790.03

Randall E. Kessler, Esq.
Kessler and Kessler
520 16th Street
Oakland, CA 94612

Subject: Underground Storage Tank Removal
285 Industrial Way
Brisbane, California

Dear Mr. Kessler:

Enclosed is the report describing tank removal and disposal activities, soil sampling procedures and laboratory analytical results at the subject site. At your request, we have submitted a copy of this report to the Brisbane Fire Department, San Mateo County Department of Health Services, and the California Regional Water Quality Control Board, San Francisco Bay Region.

If you have any questions, please call either of the undersigned.

Sincerely,

GEOMATRIX CONSULTANTS, INC.

Elizabeth K. Wells
Project Engineer

Tom Graf, P.E.
Vice President

EK/slr

Enclosures

cc: Al deBella - Brisbane Fire Department
Dennis Franks - San Mateo County Department of Health Services
Steven Ritchie - Regional Water Quality Control Board, San Francisco Bay Region

GEOMATRIX

TABLE OF CONTENTS

		Page
1.0	INTRODUCTION	1
2.0	TANK REMOVAL PROCEDURES	1
	2.1 Tank Stabilization Procedures	2
	2.2 Field Observations	2
	2.3 Tank Disposal	3
	2.4 Sampling Procedures	4
	2.5 Excavation Backfilling	4
3.0	ANALYTICAL METHODS AND RESULTS	5
4.0	SUMMARY AND CONCLUSIONS	6
5.0	REFERENCES	7

LIST OF FIGURES

Figure 1	Site Location Map
Figure 2	Tank Excavation and Soil Sampling Location

LIST OF APPENDICES

Appendix A	Tank Removal Permit, Uniform Hazardous Waste Manifest, and Certificate of Disposal
Appendix B	Chain-of-Custody Record and Laboratory Analytical Report
Appendix C	Figure 13: Approximate Area Extent of Bunker C Oil Supplemental Remedial Investigation Data Study Report, The Bayshore Rail Yard, Brisbane, California, Levine-Fricke, 31 July 1991

GEOMATRIX

Underground Storage Tank Removal
285 Industrial Way
Brisbane, California

1.0 INTRODUCTION

This report describes tank removal activities conducted on 22 and 23 April 1991 at 285 Industrial Way in Brisbane, California (Figure 1). During the course of this work, two soil samples and one groundwater sample were collected from the tank excavation and analyzed. In addition, soil samples from soil excavated during tank removal activities were collected and analyzed. The field activities and results of the analyses are discussed below. The work was performed in accordance with the 14 March 1991 Scope of Services prepared by Geomatrix Consultants, Inc. (Geomatrix) for Kessler and Kessler. Copies of this report are being submitted to the Brisbane Fire Department (BFD), the San Mateo County Department of Health Services (SMCDHS), and the Regional Water Quality Control Board, San Francisco Bay Region (RWQCB) by Geomatrix on behalf of Kessler and Kessler.

One 2000-gallon capacity underground fuel storage tank was removed under the City of Brisbane Building Department Permit Number 91-0417-11 and SMCDHS Permit Number HM-279-91. Copies of these permits are included in Appendix A. The tank reportedly was used in the past for storage of leaded gasoline and diesel. It is not known when the tank was installed.

2.0 TANK REMOVAL PROCEDURES

Excavation, tank removal, and backfilling were performed by Trumpp Brothers (Trumpp) of San Jose, California on 22 and 23 April 1991. A Geomatrix field engineer was on site to observe tank removal activities and to collect soil and groundwater samples from the tank excavation. Representatives of the BFD (Al deBella) and the SMCDHS (Dennis Franks) were on site on 23 April 1991 to observe tank removal and soil and groundwater sampling activities.

Before beginning field activities, Trumpp notified Underground Service Alert to locate underground utilities in the vicinity of the proposed tank excavation. Trumpp removed asphalt over the tank area and exposed the top of the tank on 22 April 1991. Tank stabilization and removal activities, as well as soil and groundwater sampling procedures, are discussed in the following sections.

2.1 Tank Stabilization Procedures

To render the tank inert, approximately 40 gallons of gasoline and water were pumped from the tank and placed into a 55-gallon drum by Trumpp before beginning tank removal activities. In addition, dry ice was inserted into the tank to remove organic vapors and oxygen from the tank. Explosivity meter readings taken in the tank prior to its removal indicated that vapor concentrations were below 5 percent of the Lower Explosive Limit.

2.2 Field Observations

Observations were made by Geomatrix personnel during the tank removal regarding sediment types encountered and the occurrence of petroleum in the soil. In addition, the condition of the tank was observed during field activities.

The former tank location and excavation boundary are shown on Figure 2. A 1-inch thick seal of oil and screenings over 6 inches of base rock covered the underground storage tank area. The depth to the top of the tank was approximately 3.2 feet below ground surface. The tank diameter was 6.3 feet, so that the tank bottom was at a depth of approximately 9.5 feet; the tank was 8.7 feet in length. Appurtenant piping attached to the tank included a product and vapor recovery line. The former dispenser had been located immediately adjacent to the west end of the tank; it had been removed by others before tank removal activities were conducted. The vent pipe was attached to the fence along the west side of the property (Figure 2).

After the tank had been emptied and removed, it was visually inspected. The tank was constructed of steel with welded seams, and was wrapped in adhesive tar paper. No holes

were observed in the tank.

Approximately 15 cubic yards of sand backfill from around the tank were removed and stockpiled adjacent to the excavation. Visual observation and organic vapor measurements taken with a field photoionization detector (PID) indicated that the stockpiled backfill contained no petroleum hydrocarbons. Some discoloration and odor was observed in small areas of backfill sand adhered to the tank when removed from the excavation.

Sediments surrounding the tank backfill materials consisted of orange brown sandy clay fill to a depth of approximately 3 feet below grade. A 3-inch thick layer of asphalt pavement was encountered beneath the sandy clay. Sediments beneath the old pavement layer consist of gravelly fill mixed with debris (including pieces of glass, piping, and wood). Groundwater was encountered at a depth of approximately 10 feet below grade in the excavation.

Visual inspection and odor of the native sediments above the groundwater table did not indicate the presence of petroleum hydrocarbons. The native sediments below the groundwater table, however, were stained black and smelled of petroleum hydrocarbons. Based on the field observations, approximately 15 cubic yards of soil from beneath the water table was excavated and stockpiled at a nearby location on plastic sheeting.

2.3 Tank Disposal

The tank and appurtenant piping, and the 55-gallon drum, were transported with a uniform hazardous waste manifest by a licensed hazardous waste transporter (H&H Ship Services [H&H]) to its receiving facility in San Francisco, California. A copy of the manifest is included in Appendix A. The tank was subsequently cut, cleaned, and rendered harmless by H&H and disposed of as scrap metal at Levin Metals Corporation, in Richmond, California. A copy of the Certificate of Disposal is included in Appendix A.

2.4 Sampling Procedures

Two soil samples (TWE-10 and TWW-10) were collected from the east and west sidewalls of the excavation at a depth of approximately 10 feet below grade at the locations shown on Figure 2. As specified by the SMCDHS representative, the soil samples were collected from immediately above the groundwater table using the backhoe bucket. The samples were collected directly from the bucket of the backhoe by first removing the upper 6 inches of soil in the bucket and driving a clean, thin-walled brass tube into the remaining soil. The sample was sealed at each end with aluminum foil, plastic end caps, and duct tape.

In addition, the SMCDHS representative requested a groundwater sample (GW-1) be collected from the tank excavation. A small pit was excavated with the backhoe in which groundwater was allowed to collect. Samples were collected in 40-milliliter volatile organic analysis vials with no headspace.

SMCDHS requested the sand backfill, that had surrounded the tank and had been removed from the excavation, be sampled and analyzed to confirm that it did not contain significant concentrations of petroleum hydrocarbons. Two soil samples were collected (SP1-A and SP1-B) from the stockpile by removing the upper 1 foot of soil in the sampling area and driving a clean, thin-walled brass tube into the remaining soil. The samples were sealed at each end with aluminum foil, plastic end caps, and duct tape.

The soil and groundwater samples were labeled and stored in an ice-cooled container until delivery under Geomatrix chain-of-custody procedure to Chromalab, Inc. (Chromalab) of San Ramon, California, a state-certified laboratory. A copy of the chain-of-custody record is included in Appendix B.

2.5 Excavation Backfilling

The excavation was backfilled by Trumpp to original grade with the sand backfill formerly surrounding the underground storage tank and with imported Class II baserock. Backfill was compacted using a sheep's foot roller attached to a Case 580D backhoe in 1- to 2-foot

thick lifts. The area was resurfaced after receiving the analytical results of the soil and groundwater samples.

3.0 ANALYTICAL METHODS AND RESULTS

Analytical results for the excavation soil and groundwater samples are summarized on Figure 2. The soil samples collected from the excavation, the sand backfill samples, and the groundwater sample were analyzed for total petroleum hydrocarbons (TPH) as gasoline by U.S. Environmental Protection Agency (EPA) Method 5030 and benzene, toluene, ethylbenzene, and xylenes (BTEX) by EPA Method 8020 by Chromalab. The soil samples collected from the stockpiled sand backfill were composited by Chromalab before analysis. The soil samples collected from the excavation additionally were analyzed for TPH as diesel by EPA Method 3550 and organic lead using the California Leaking Underground Fuel Tank (LUFT) method. The composited stockpile samples also were analyzed for TPH as diesel by EPA Method 3550. Diesel analyses were performed by Chromalab and organic lead analyses were performed by Mobile Chem Labs, Inc. of Lafayette, California. Copies of the laboratory analytical reports are included in Appendix B.

The analytical results indicate that TPH as gasoline and TPH as diesel were not present above the laboratory detection limits of 1 milligram per kilogram (mg/kg) in the soil samples collected from the excavation sidewalls. In addition, the soil sample contained no BTEX above the laboratory detection limit of 0.005 mg/kg. Organic lead was not detected in the soil samples above the laboratory detection limit of 0.5 mg/kg.

The analytical results indicate that the groundwater sample collected from the tank excavation contained no TPH as gasoline or BTEX above the laboratory detection limits of 0.05 and 0.0005 milligrams per liter (mg/l), respectively.

The analytical results for the composited sand backfill soil sample are presented in Table 1. The results indicate that the sand backfill from the excavation contained no TPH as gasoline

or BTEX above the laboratory detection limits of 1 and 0.005 mg/kg, respectively.

4.0 SUMMARY AND CONCLUSIONS

One underground storage tank and approximately 40 gallons of gasoline and water pumped from the tank were removed and disposed by a licensed hazardous waste transportation company under a hazardous waste manifest. The tank reportedly had been used for storage of leaded gasoline, as well as diesel, in the past. Observation of the tank upon removal indicated that the tank was in good condition with no obvious indications that fuel had leaked from the tank. Laboratory analysis for petroleum hydrocarbons of sidewall soil samples, a grab groundwater sample, and backfill soil samples indicate that gas or diesel did not leak from the tank into subsurface soil or groundwater. The tank excavation was backfilled to original grade with tank backfill sand and with imported backfill and resurfaced with asphalt.

Visual observation and odor of soil beneath the groundwater surface in the tank excavation indicated that petroleum hydrocarbons were present. Review of environmental investigation work performed by Levine-Fricke, Inc. of Emeryville, California, at property adjacent and immediately east of the 285 Industrial Way property indicates that Bunker C oil is widespread in subsurface soil at depths corresponding to the groundwater table. A map showing the approximate areal extent of the Bunker C oil, presented in Appendix C (Levine-Fricke, 1990), indicates that the oil has migrated to the west and likely beneath the 285 Industrial Way site. Therefore, the petroleum hydrocarbon-affected soil beneath the groundwater surface does not appear to be a result of leakage from the former underground storage tank at the subject site; but rather likely attributed to oil that has migrated onto the site from the adjacent property.

Based on these results, no further investigation activities are recommended prior to the underground storage tank site closure.

5.0 REFERENCES

Levine-Fricke, Inc. 1990, Supplemental Remedial Investigation Data Study Report, the Bayshore Railyard, Brisbane, California, prepared for Tuntex Properties, Inc., July 31.

GEOMATRIX

TABLE 1

ANALYTICAL RESULTS
SAND BACKFILL SOIL SAMPLES[1]
285 Industrial Way
Brisbane, California

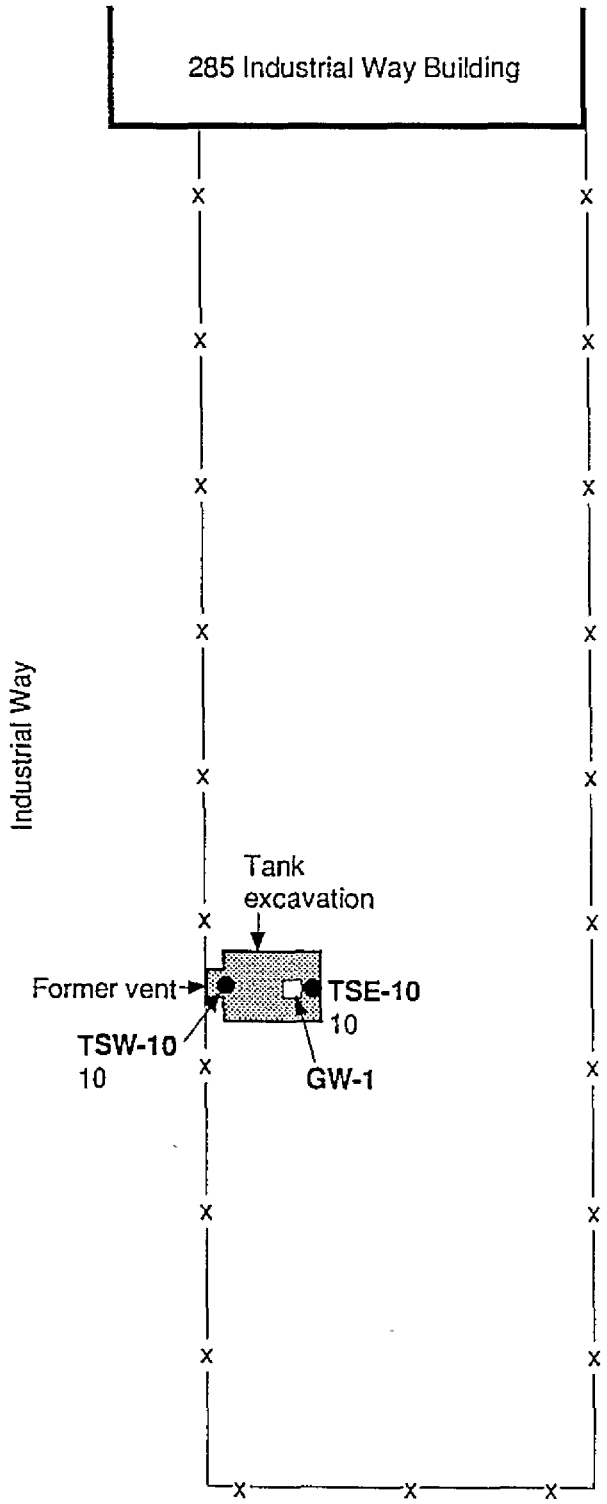
concentrations in parts per million (mg/kg)

Sample No.	Gasoline	Diesel	Benzene	Toluene	Ethyl-benzene	Total Xylenes
SP1-A,B	<1	<1	<0.005	<0.005	<0.005	<0.005

[1] Soil samples collected on 23 April 1991 by Geomatrix Consultants, Inc. and composited and analyzed by Chromalab, Inc. of San Ramon, California by EPA Methods 5030/8015 for gasoline and diesel and by EPA Method 8020 for benzene, toluene, ethylbenzene, and total xylenes.



GEOMATRIX	SITE VICINITY MAP 285 Industrial Way Brisbane, California	Figure 1 Project No. 1790.03



ANALYTICAL RESULTS

Compound (ppm)	Soil Samples		Ground water
	TSE-10	TSW-10	GW-1
Gasoline	<1	<1	<0.05
Diesel	<1	<1	NA
Benzene	<0.005	<0.005	<0.0005
Toluene	<0.005	<0.005	<0.0005
Ethylbenzene	<0.005	<0.005	<0.0005
Total xylenes	<0.005	<0.005	<0.0005
Organic lead	<0.5	<0.5	NA

Samples analyzed by Chromalab, Inc. by EPA Methods 5030/8015 for gasoline and diesel and by EPA Method 8020 for benzene, toluene, ethylbenzene, and total xylenes.
NA = Not analyzed

EXPLANATION

- ● Soil sample location
- 10 Sample depth, feet
- □ Groundwater sample location

0 25 Feet

GEOMATRIX

TANK EXCAVATION AND SOIL AND GROUNDWATER SAMPLING LOCATIONS
285 Industrial Way
Brisbane, California

Figure 2

Project No. 1790.03

GEOMATRIX

APPENDIX A

Tank Removal Permit,
Uniform Hazardous Waste Manifest, and
Certificate of Disposal

ENVIRONMENTAL HEALTH PERMIT

San Mateo County Department of Health Services
590 Hamilton Street, Redwood City, CA 94063

Permit to CLOSE UNDERGROUND HAZARDOUS MATERIALS
STORAGE TANK - 1 tank @ 1000 gallon

At 285 Industrial Way
Brisbane, CA 94005

No.	HM-279-91
Date	3/28/91
Fee paid	$313.00 3/25/91
APN	S560029
Ordinance No.	02865

PERMIT ISSUED BY Dennis Franks

This permit has been granted to:
Kessler & Kessler Inc.
520 16th Street
Oakland, CA 94612
Tele. 836-4848

Contractor:
General Engineering & Construction
1540 Industrial Ave.
San Jose, CA 95112
Tele. (408) 292-1201

For the Director of
Environmental Health

THIS PERMIT IS NONTRANSFERABLE AND MUST BE ON JOB SITE
Permit shall be void if construction is not started within 90 days of date of this permit.

Prepared by Sue

cc: City of Brisbane Fire & Bldg. Dept.

BRISBANE BLDG. PLAN CHECK

O.K.		INITIAL	DATE
☐	WATER		
☐	SEWER		
☐	STREET		
☑	FIRE	PB	4/19
☐	CITY ENG.		
☐	PLANNING		

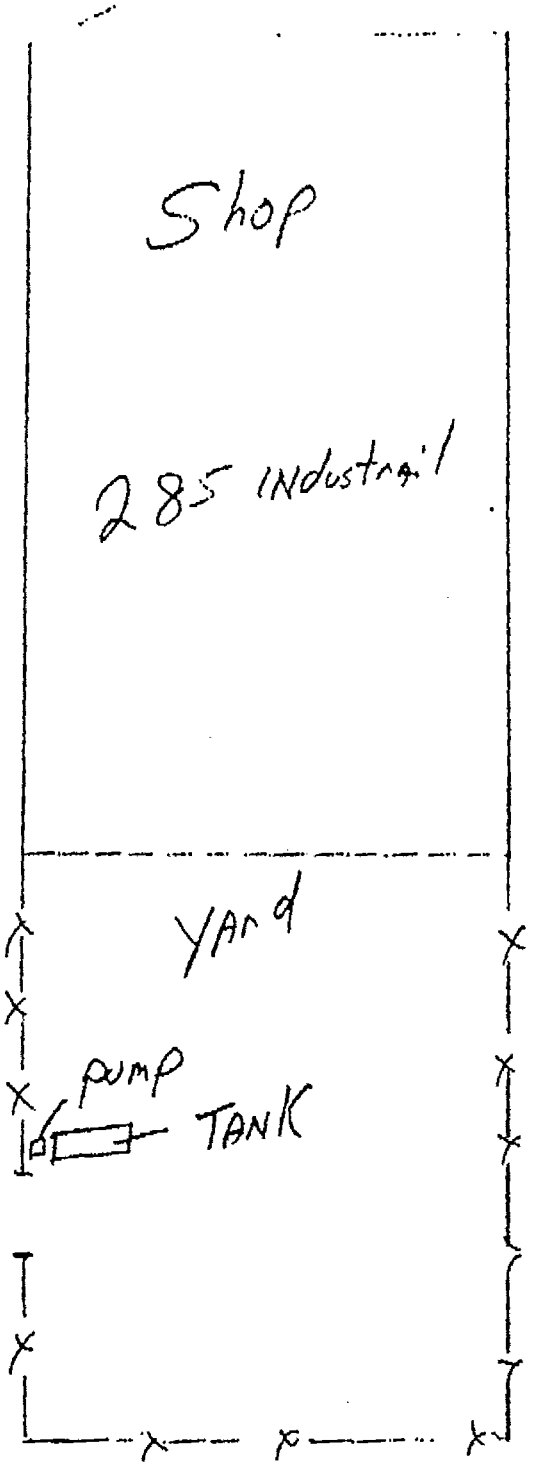
JOB COPY

Shore Line Dr.

Industrial Way

N

Kessler & Kessler
TANK Removal



BUILDING PERMIT

PERMIT NO. 91-0417-11

SITE ADDRESS: 285 Industrial Way

ASSESSOR PARCEL NO.: 005-320-020

SUBDIVISION: City of Visitacion

OWNER'S NAME: Kesti Ltd a Kesti Ltd

ADDRESS: 520 16th CITY

ZIP CODE: TEL.

ARCHITECT'S/ENGINEER'S NAME:

ADDRESS: CITY

ZIP CODE: TEL.

CALIFORNIA LIC. NO.

TYPE OF WORK (CIRCLE ONE)
NEW ALTERATION MOVE
ADDITION REPAIR DEMOLITION

TYPE OF CONSTRUCTION (CIRCLE ONE)
I II-1H III-1H IV V-1H
II-FR II-N III-N V-N

TYPE OF OCCUPANCY (CIRCLE ONE)
A I B R-3
E H R-1 M

SQUARE FEET:

VALUATION: $ 4000

ZONING DISTRICT: M-1

	BY/DATE	TOTAL/RECEIPT
CONTRACTOR: Trump Brothers		BUILDING: 79.20 .68 79.88
ADDRESS: 1540 Ind Ave - SJ		
LIC. NO.: 324079-406 TEL.: 292-8220		
WC: 2 INSURER: Accid		
CONTRACTOR		ELECTRICAL
ADDRESS		
LIC. NO. TEL.		
WC INSURER		
CONTRACTOR		PLUMBING
ADDRESS		
LIC. NO. TEL.		
WC INSURER		
CONTRACTOR		MECHANICAL
ADDRESS		
LIC. NO. TEL.		
WC INSURER		

PLANNING APPROVAL

ENGINEERING APPROVAL | PUBLIC WORKS APPROVAL

FIRE APPROVAL: INSTALLATION/REMOVAL APPROVED as DeBelle 4-23-91

DESCRIPTION OF WORK:
Removal of underground haz. mat. tank

LENDER

PLANNING COMMISSION ACTION: YES ☐ NO ☐

DATE GRANTED: FILE NUMBER:

PLAN. DEPT. FEE: RECEIPT PLAN CHECK

☐ I certify that I am the legal owner of the property on which this permit is being issued and that I do not intend to sell the property within one year of the completion of this work.

☐ I certify that in the performance of this work for which this permit is being issued I shall not employ any person in any manner so as to become subject to the Workmen's Compensation laws of California.

☐ I certify that I have a valid contractor's license issued by the State of California.

I hereby acknowledge that I have read this application and state that the above is correct and agree to comply with all applicable Ordinances and State Laws regulating building construction.

SIGNED: [signature] DATE: 4/17/91

This Building Permit shall not be valid or effective for any purpose whatsoever unless and until approved and issued by the Building Inspection Section.
This Permit does NOT INCLUDE any construction within the Public Right of Way. Attention is particularly called to the cutting up of streets, making main **sewer** connections, **driveways** and **curbs**. Permit for such construction shall be obtained from the Road Department.
Permits must be obtained for all accessory buildings, such as garages, chicken houses, sheds, etc.
This Permit shall expire by limitation if work authorized is not commenced within 180 days.

BUILDING INSPECTION DEPARTMENT APPROVAL
BY: [signature] DATE: 4/23/91

CITY OF BRISBANE
Telephone (415) 467-4180 or (415) 467-1515

BUILDING DEPARTMENT
44 VISITACION AVENUE • BRISBANE, CALIFORNIA 94005

Description of Work: Removal of Underground tank

SITE ADDRESS: 285 Industrial

INSPECTION RECORD

PERMIT NO. 91-041711

INSP.	ITEM	APPROVED	DATE/BY
1	FOUNDATION/ZONING UNDERGROUND PLBG/ELECTRIC		
	DO NOT COVER ABOVE WORK UNTIL APPROVED		
2	SLABS RETAINING/STRUCTURAL WALLS		
	DO NOT COVER ABOVE WORK UNTIL APPROVED		
3	BELOW FLOOR FRAMING BELOW FLOOR PLUMBING BELOW FLOOR ELECTRIC BELOW FLOOR DUCTS & VENTS		
	DO NOT COVER ABOVE WORK UNTIL APPROVED		
4	ABOVE FLOOR FRAMING ABOVE FLOOR PLUMBING ABOVE FLOOR ELECTRIC DUCTS, VENTS & FLUES ROOFING/SIDING NAILING FIRE PLACE		
	DO NOT COVER ABOVE WORK UNTIL APPROVED		
5	SHOWER PAN (WATER TEST) INSULATION		
	DO NOT COVER ABOVE WORK UNTIL APPROVED		
6	GYPSUM BOARD NAILING STUCCO WIRE		
	DO NOT COVER ABOVE WORK UNTIL APPROVED		
7	SEWER CONNECTION WATER CONNECTION		
	DO NOT COVER ABOVE WORK UNTIL APPROVED		
8	FINISHED FRAMING FINISHED PLUMBING FINISHED ELECTRIC		
	DO NOT COVER ABOVE WORK UNTIL APPROVED		
9	GRADING/DRAINAGE DRIVEWAY INSULATION CERTIFICATE		
	ENGINEERING		
	FIRE		
	GAS TEST AND TAG		
	ELECTRICAL TAG		

FINAL APPROVAL DATE/BY

DATE	BY	REMARKS
4-23-91	A.D.	Removal of Tank in Entirety and approved. ok D. Smith

THIS PERMIT EXPIRES ONE YEAR FROM DATE OF ISSUANCE.

CITY OF BRISBANE
TELEPHONE (415) 467-4180 or (415) 467-1515

BUILDING INSPECTION DEPARTMENT
150 North Hill Drive, Suite 40
Brisbane, California 94005

PERMANENT TANK CLOSURE INSPECTION SHEET

SITE NAME: C&T Forklift DATE: 4/23/91
ADDRESS: 285 Industrial
RESPONSIBLE PARTY: Randall Crisler CONTACT: R. C.
ADDRESS: PHONE: 536-4848

PRE-INSPECTION INFORMATION

HAS PERMIT BEEN ISSUED? X Y __ N
PERMIT # HM2799

AND SIZE OF TANKS: ____ UL 2000 REG ____ D
____ WO ____ OTHER

REASON FOR REMOVAL: Discontinue Use
DOES HISTORY INDICATE PROBLEM __ Y X N Explain

DO MONITORING WELLS EXIST ON SITE? __ Y X N (indicate on site map)
DEPTH TO GROUNDWATER: 10 Ft

ON-SITE INFORMATION (PREPARE SITE MAP ON SECOND PAGE)

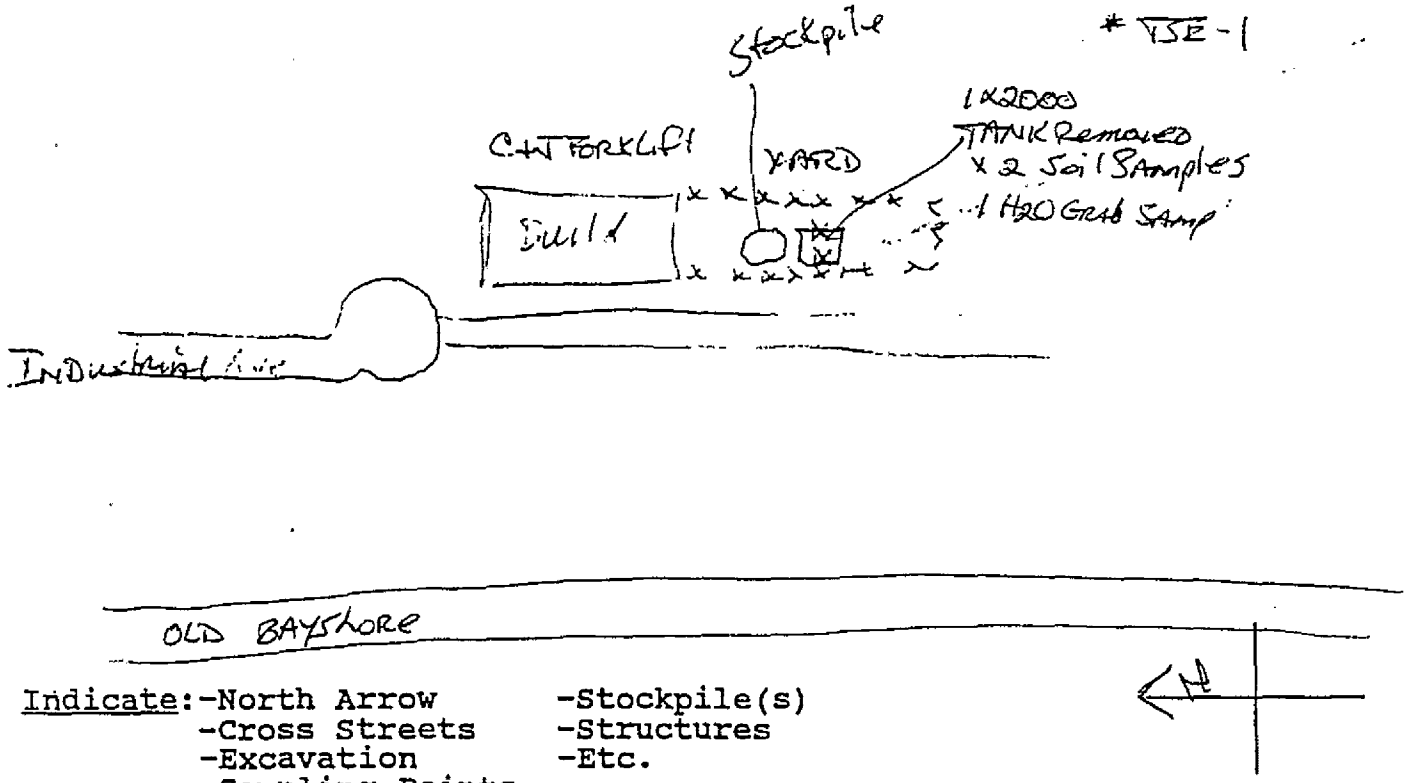
1. IS SITE SAFETY PLAN ON SITE: __ Y X N
2. CONDITION OF TANKS AND PIPING: No Holes - Good Condition
3. EVIDENCE OF LEAKAGE? X Y ~~X~~ N Explain Discolored, odor, sand backfill on bottom at pit
4. WAS GROUNDWATER ENCOUNTERED IN PIT? X Y __ N If so, Depth? 10
   FLOATING PRODUCT? __ Y X N SHEEN? __ Y X N
   WAS WATER SAMPLED? X Y ~~X~~ N PIT PUMPED? __ Y X N
   VOLUME PUMPED (Approx) ____ gal
5. INDICATE ON SITE PLAN WHERE SOIL/GW SAMPLES TAKEN
6. ANALYSIS REQUIRED? X 5030 X 3550/3510 __ 8020/8240 __ 503D&E
   X 601/624 X ~~TPH~~ ORGANIC LEAD __ METALS __ 8010/8240 __ 8720
7. SAMPLES FROM STOCKPILE TAKEN? X Y __ N If so, How Many
   VOLUME OF STOCKPILED SOIL? (Approx) 15 cu yds
8. CHAIN OF CUSTODY CHECKED? X Y __ N
9. SOIL/GW SAMPLING COMMENTS: Two Soil Subsurface Samples Above H2O. One GW Grab Sample, 1 Stockpile Composite
10. WAS PIT OVEREXCAVATED __ Y X N Volume? ____ cu yds
    (Indicate on site map)
11. TANK MANIFEST #: 7054210G RINSATE MANIFEST#: 7054210G
    PIT WATER MANIFEST#: ____ 55 GALLONS DRUM

FOLLOW-UP INFORMATION

ANALYSIS RECEIVED? __ Y __ N COCs, METHODS, ETC. CHECKED? __ Y __ N
MANIFESTS RECEIVED? __ Y __ N MANIFEST #s CHECKED? __ Y __ N
LEAK REPORT FILED? (If Needed) __ Y __ N

INSPECTOR: Dennis Franks REC. W/ attached
TITLE: Hazmat Specialist DATE: 4/23/91

SITE MAP



Indicate:-North Arrow -Stockpile(s)
-Cross Streets -Structures
-Excavation -Etc.
-Sampling Points

ADDITIONAL COMMENTS:

- Sand back fill Clean - Some discoloration and odor in a few small patches of sand.
Native soil contains mostly old fill material (Garbage)

ENVIRONMENTAL SERVICES
(DIVISION OF H&H SHIP SERVICE CO., INC.)

220 CHINA BASIN, SAN FRANCISCO, CA 94107 • DAY AND NIGHT: 543-4835

CERTIFICATE OF DISPOSAL

APRIL 26, 1991

H & H Ship Service Company hereby certifies to *TRUMPP BROTHERS*

1. The storage tank(s), size(s) *ONE (1) 2,000 GALS.*

   removed from the *KESSLER & KESSLER*
   285 INDUSTRIAL WAY
   BRISBANE, CALIFORNIA

   were transported to H & H Ship Service Company, 220 China Basin St., San Francisco, California 94107.

2. The following tank(s), H & H Job Number *7444*

   have been steamed cleaned, cut with approximately 2' X 2' holes, rendered harmless and disposed of as scrap metal.

3. Disposal site: *SCHNITZER STEEL, OAKLAND, CALIFORNIA.*

4. The foregoing method of destruction/disposal is suitable for the materials involved, and fully complies with all applicable regulatory and permit requirements.

5. Should you require further information, please call (415) 543-4835.

Very Truly Yours,

Cleveland Valrey
Operations Coordinator

END

GEOMATRIX

APPENDIX B

Chain-of-Custody Record and
Laboratory Analytical Report

CHROMALAB, INC.

Analytical Laboratory (E694)

5 DAYS TURNAROUND

April 30, 1991 ChromaLab File No.: 0491165

GEOMATRIX CONSULTANTS, INC.

Attn: Elizabeth Klainer

RE: One water and three soil samples for Gasoline/BTEX and Diesel analyses

Project Number: 1790.03
Date Sampled: April 23, 1991 Date Submitted: April 23, 1991
Date Extracted: April 29, 1991 Date Analyzed: April 29, 1991

RESULTS:

Sample No.	Gasoline (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethyl Benzene (µg/L)	Total Xylenes (µg/L)
GW-1	N.D.	N.D.	N.D.	N.D.	N.D.
DET. LIMIT	50	0.5	0.5	0.5	0.5
METHOD OF ANALYSIS	5030/ 8015	602	602	602	602

Sample No.	Gasoline (mg/Kg)	Diesel (mg/Kg)	Benzene (µg/Kg)	Toluene (µg/Kg)	Ethyl Benzene (µg/Kg)	Total Xylenes (µg/Kg)
TSE-10	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
TSW-10	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
SP1-A,B*	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
BLANK	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
SPIKE RECOVERY	112.7%	92.6%	91.4%	85.4%	86.9%	85.7%
DUP SPIKE RECOVERY	108.6%	88.7%	85.5%	107.1%	96.5%	100.3%
DETECTION LIMIT	1.0	1.0	5.0	5.0	5.0	5.0
METHOD OF ANALYSIS	5030/ 8015	3550/ 8015	8020	8020	8020	8020

*Composite sample.

ChromaLab, Inc.

David Duong
Chief Chemist

Eric Tam
Laboratory Director

2239 Omega Road, #1 • San Ramon, California 94583
415/831-1788 • Facsimile 415/831-8798
Federal ID #68-0140157

GEOMATRIX CONSULTANTS

ONE MARKET PLAZA
SPEAR STREET TOWER SUITE 717
SAN FRANCISCO, CALIFORNIA 94105
(415) 957-9557

CHROMALAB FILE # 491165

Chain of 2126

DATE 4/23/11 PAGE 1 OF 1

PROJECT NO. 1790.03

SAMPLERS: (SIGNATURE) Elizabeth Klainer

DATE	TIME	SAMPLE NUMBER	GENERAL MINERAL	PRIORITY POLLUTANT METALS	EPA METHOD 624	EPA METHOD 625	EPA METHOD 601	EPA METHOD 602	EPA METHOD 608	PETROLEUM HYDROCARBONS	TPH-gasoline	TPH-diesel	Organic lead	BTEX	NUMBER OF CONTAINERS
4/23	1130	GW-1									X			X	3
4/23	1020	TSE-10									X	X	X	X	1
4/23	1105	TSW-10									X	X	X	X	1
4/23	1200	SP1-A Composite									X	X		X	1
4/23	1200	SP1-B													1

ANALYSES

REMARKS (SAMPLE PRESERVATION, HANDLING PROCEDURES, OBSERVATIONS, ETC.)

Results to Elizabeth Klainer

Standard 5-day turnaround

Composite SP1-A and B before analysis

We will call you 4/24 about possibly centrifuging the water sample

Please use M- regional recommended detection limits

TOTAL NUMBER OF CONTAINERS 7

RELINQUISHED BY:	DATE	RECEIVED BY:	RELINQUISHED BY:	DATE	RECEIVED BY: (LAB)
Elizabeth Klainer	4/23/11	T. Donovan		4/23	T. Donovan
SIGNATURE Elizabeth Klainer		SIGNATURE	SIGNATURE		SIGNATURE
PRINTED NAME Geomatrix	TIME 1630	PRINTED NAME Chromalab, Inc.	PRINTED NAME	TIME 5:30	PRINTED NAME Chromalab
COMPANY		COMPANY	COMPANY		LABORATORY
RELINQUISHED BY:	DATE	RECEIVED BY:	METHOD OF SHIPMENT: Pick up		
SIGNATURE		SIGNATURE	LABORATORY COMMENTS / OBSERVATIONS		
PRINTED NAME	TIME	PRINTED NAME			
COMPANY		COMPANY			

DISTRIBUTION: WHITE, CANARY- LABORATORY, PINK - ORIGINATOR

GEOMATRIX

APPENDIX C

Figure 13: Approximate Areal Extent of Bunker C Oil
Supplemental Remedial Investigation Data Study Report
The Bayshore Rail Yard, Brisbane, California
Levine-Fricke
31 July 1990

BRISBANE
LANDFILL
(1933? – PRESENT)

EXPLANATION:

Estimated lateral boundary of Bunker C oil contamination

Levine • Fricke A-zone monitoring well

Levine • Fricke soil boring
- TTSB - Turntable area soil boring
- OTSB - Oil tank area soil boring
- SDSB - South disposal area soil boring

Trench location and orientation
- NT - North area trench
- TTT - Turntable area trench
- OTT - Oil tank area trench
- SDT - South disposal area trench

SL (1'-5.5') — Depth of observed contaminant

Denotes type or relative amount of contaminant (see key to abbreviation)

Key to abbreviations:

Relative amounts of bunker oil observed in trenches:
- L - Light
- M - Moderate
- H - heavy

O - other oils observed
SL - Metal slag observed
N - No oil or metal observed

Note:

Trenches generally 8' long x 3' wide are shown not to scale.

N

A'

B

B'

A

OTT-12 N
OTSB-6 N
OTT-16 N
OTSB-11 N
OTT-6 L (3'-6')
OTT-9 M (3.6'-6')
OTT-21 L (4.5'-4.7')
L (6.5'-7')
M (4.8'-5.2')
OTT-17
SDSB-10
SDSB-1
L (7.5'-8')
SDT-1 N
LF-7A
L (5.5'-6')
SDSB-2 N
OTT-2 L
OTT-3 H (6'-9')
OTT-4 H (5.3'-9.5')
OTT-7 H (5'-8')
H (5.2'-5.6')
OTT-13
L (3'-4')
OTT-5 H (3.5'-4')
OTT-10 H (3.2'-4.2')
OTT-14 H (4'-5')
OTT-20 N
OTT-22 M (6'-8')
SURFACE DRAINAGE
OTT-1 H (7'-?) O (1'-4')
OTT-8 H (2.4'-7.5')
H (4'-6.5')
OTT-11
OTT-18 N
OTSB-8
H (3'-6')
H (7'-9')
OTT-15
H (3.3'-6')
OTSB-10
OTT-19 N
OTSB-5
H (8'-9')
OTSB-3
H (6'-7.5')
OTSB-4 N
OTSB-7 N
OTSB-9 N
KPSB-5
KPSB-3 N
KPSB-1 M (7'-7.5')
TTSB-1 H (6'-9')
TTSB-3 N
TTSB-5
TTSB-9 M (7'-12') O (3.5'-5')
TTSB-8 N
TTT-4
TTT-7 N
TTT-8 O (1'-3')
TTT-9 O
TTT-10 O (0-3')
TTT-11 M (5'-6') O (1'-4')
TTT-12 L
TTT-6 O (0.5'-1.5')
TTSB-7 O
SDT-9 N
SDT-7 SL
SDT-6 N
SDT-5 SL (4'-5')
SL (1'-5.5') SDT-3
SDT-4 SL (1'-7')
SDT-2 SL
SDT-8 N
RAILYARD DISPOSAL SITE (1955 – 1989?)
OIL TANK
TURN TABLE
AUTOMOBILE REFINISHING
MOORE CO.
FERTILIZER PLANT
WAREHOUSE
GLUE WORKS
CONSOLIDATED CHEMICAL INDUSTRIES
MACHINE SHOP
TUBE & GLUE PLANT
BONE STORAGE
WAREHOUSE
INDUSTRIAL WAY
BAYSHORE BLVD
285 Industrial Way Site

0 100 200 FEET

Note

Adapted from "Supplemental Remedial Data Study Report, The Bayshore Railyard, Brisbane, California" Levine • Fricke, July 31, 1990.

Figure 13:
APPROXIMATE AREAL EXTENT OF BUNKER C OIL

Project No. 2034

LEVINE • FRICKE
CONSULTING ENGINEERS AND HYDROGEOLOGISTS

FILE 1790.02

GEOMATRIX

RECEIVED
OCT 2 2 1992
TREADWELL & ROLLO

UNDERGROUND STORAGE TANK REMOVAL

350 Industrial Way
Brisbane, California

Prepared for

Kessler and Kessler
520 16th Street
Oakland, California

July 1991
Project No. 1790.02

One Market Plaza
Spear Street Tower, Suite 717
San Francisco, CA 94105
(415) 957-9557

GEOMATRIX

26 July 1991
1790.02

Randall E. Kessler, Esq.
Kessler and Kessler
520 16th Street
Oakland, CA 94612

Subject: Underground Storage Tank Removal
350 Industrial Way
Brisbane, California

Dear Mr. Kessler:

Enclosed is the report describing tank removal and disposal activities, soil sampling procedures, laboratory analytical results, and conclusions and recommendations for the subject site. At your request, we have submitted a copy of this report to the Brisbane Fire Department, San Mateo County Department of Health Services, and the California Regional Water Quality Control Board, San Francisco Bay Region.

If you have any questions, please call either of the undersigned.

Sincerely,

GEOMATRIX CONSULTANTS, INC.

Elizabeth K. Wells

Elizabeth K. Wells
Project Engineer

Tom Graf, P.E.
Vice President

EK/gkm

Enclosures

cc: Al deBella - Brisbane Fire Department
Dennis Franks - San Mateo County Department of Health Services
Steven Ritchie - Regional Water Quality Control Board, San Francisco Bay Region

GEOMATRIX

TABLE OF CONTENTS

		Page
1.0	INTRODUCTION	1
2.0	TANK REMOVAL PROCEDURES	1
	2.1 Tank Stabilization Procedures	1
	2.2 Field Observations	2
	2.3 Tank Disposal	3
	2.4 Sampling Procedures	3
3.0	ANALYTICAL METHODS AND RESULTS	3
4.0	AERATION OF STOCKPILED SOIL	4
5.0	SUMMARY	4
6.0	RECOMMENDATIONS	5

LIST OF FIGURES

Figure 1	Site Vicinity Map
Figure 2	Tank Excavation and Soil Sampling Location

LIST OF APPENDICES

Appendix A	Permit and Certificate of Disposal
Appendix B	Analytical Laboratory Reports and Chain-of-Custody Records

GEOMATRIX

UNDERGROUND STORAGE TANK REMOVAL

350 Industrial Way
Brisbane, California

1.0 INTRODUCTION

This report describes tank removal activities at 350 Industrial Way in Brisbane, California (Figure 1). Tank removal and disposal procedures, soil sampling and laboratory analyses results, conclusions and recommendations are presented in this report. This report is being submitted to the San Mateo County Department of Health Services (SMCDHS), Brisbane Fire Department (BFD), and California Regional Water Quality Control Board, San Francisco Bay Region (RWQCB) on behalf of Kessler and Kessler.

The tank reportedly had been used for the storage of gasoline. One 1000-gallon underground storage tank was removed under San Mateo County permit HM-247-91 (Appendix A). The tank, which reportedly was installed sometime after 1970, has not been used since 1983.

2.0 TANK REMOVAL PROCEDURES

Breaking and removing asphalt and concrete over the tank, tank removal, soil excavation, and backfilling the excavation were performed by Trumpp Brothers of San Jose (Trumpp), California between 25 and 27 February 1991. Representatives of SMCDHS (Dennis A. Franks) and BFD (Paul Rusca) were on site on 26 February 1991 to observe tank removal activities and soil sampling. Geomatrix Consultants, Inc. (Geomatrix) personnel also were on site to observe tank removal and soil excavation activities and to collect soil samples.

2.1 TANK STABILIZATION PROCEDURES

No fluid was observed in the tank when it was uncovered. Trumpp rendered the tank inert by inserting dry ice into the tank to remove organic vapors and oxygen. Explosivity meter readings taken in the tank by the SMCDHS representative indicated that vapor concentrations

were below 10 percent of the lower explosive limit.

2.2 FIELD OBSERVATIONS

Geomatrix personnel made observations regarding sediment types encountered and the occurrence of petroleum in soil during tank removal activities.

The former tank location and excavation boundaries are shown in Figure 2. The underground storage area was covered with a 12 to 18-inch thick concrete pad. Depth to the top of the tank was approximately 3 feet below ground surface. The tank, constructed of 10-gauge steel and wrapped in tar paper, was 45.5 inches in diameter and 144 inches in length.

After the tank was removed, it was visually inspected by Geomatrix personnel and the SMCDHS representative. The tar wrap was generally intact; however, a 1/2-inch diameter hole was observed on the side of the tank on the north end. No cracks or holes were observed in the product piping .

Backfill surrounding the tank was sand containing debris (including pieces of concrete, cable, and wood). Native soil consisting of a dark clay was observed below the backfill at a depth of approximately 8.5 feet below ground surface. Groundwater was not encountered during excavation activities.

Visual and olfactory observations were used to assess the presence of petroleum hydrocarbons in backfill soil around the tank. The soil was observed to be stained a blue-green color, and a petroleum odor was noted in the soil above the tank and on the eastern sidewall.

After tank removal, approximately 20 cubic yards of petroleum hydrocarbon-affected soil were excavated and stockpiled nearby on plastic sheeting (Figure 2).

2.3 TANK DISPOSAL

The tank and appurtenant piping were transported with a uniform hazardous waste manifest by a licensed hazardous waste transporter (H&H Ship Service) to their licensed receiving facility in San Francisco. A copy of the certificate of disposal is included in Appendix A.

2.4 SOIL SAMPLING PROCEDURES

The SMCDHS representative requested that two samples of the native soil be collected: one from the north end and one from the south end of the tank excavation. The soil samples were collected from the backhoe bucket in clean brass tubes. Four samples of the stockpiled soil were collected in brass tubes. The tubes were sealed with aluminum foil, plastic end caps, and duct tape. The samples were placed in an ice-cooled chest until delivered to a state-certified analytical laboratory, Chromalab, Inc. (Chromalab) of San Ramon, California, under chain of custody procedures. A copy of the chain-of-custody record is included in Appendix B.

The excavation was backfilled by Trumpp with imported sand and compacted. The area was resurfaced with concrete to match existing grade.

3.0 ANALYTICAL METHODS AND RESULTS

As required by the SMCDHS, the soil samples were analyzed for total petroleum hydrocarbons (TPH) as gasoline using EPA Method 5030/8015, benzene, toluene, ethylbenzene and xylenes (BTEX) using EPA Method 8020, and soluble lead using EPA Method 1310/3010/7240. The four samples collected from the stockpiled soil were composited by Chromalab before analysis. Analytical results of the excavation soil samples are summarized on Figure 2. A copy of the laboratory analytical report is included in Appendix B.

Analytical results indicate the soil sample from beneath the north end of the tank (EX1-3)

contained 33 milligrams per kilogram (mg/kg) of TPH as gasoline, and BTEX at concentrations ranging from 0.014 to 0.170 mg/kg. Soluble lead was detected at a concentration of 0.15 milligrams per liter (mg/l) for sample EX 1-3. The soil sample from beneath the south end of the tank (EX1-2) contained 4900 mg/kg of TPH as gasoline and BTEX at concentrations ranging from 15 to 160 mg/kg. The amount of soluble lead detected in sample EX1-2 was 0.45 mg/l.

The composited sample contained TPH as gasoline at a concentration of 3900 mg/kg, BTEX at concentrations of 4.1, 75, 22, and 120 mg/kg, respectively, and soluble lead at a concentration of 0.49 mg/l.

4.0 AERATION OF STOCKPILED SOIL

Based on the analytical results of the samples from the stockpiled soil, the soil was aerated by Trumpp to remove gasoline and BTEX. After the soil had been turned twice and aeration was considered complete, Geomatrix collected two soil samples from the stockpile on 23 April 1991. The samples were composited by Chromalab before analysis for TPH as gasoline by EPA Method 5030 and BTEX by EPA Method 8020. Analytical results indicate the soil does not contain gasoline or BTEX above the laboratory detection limits of 1 and 0.005 mg/kg, respectively (Appendix B). Based on these analytical results, SMCDHS in their 24 May 1991 letter to Kessler and Kessler, approved placement of the aerated soil as fill at a neighboring parcel at 55 Industrial Way, also owned by Kessler and Kessler.

5.0 SUMMARY

One underground gasoline storage tank was removed and disposed of by a licensed hazardous waste transportation company under a hazardous waste manifest. Observation of the tank upon removal indicated that it had one hole in the end. Soil surrounding the tank had a strong petroleum odor and contained elevated concentrations of gasoline, ethylbenzene, and total xylenes. Approximately 20 cubic yards of petroleum hydrocarbon-affected soil in the

immediate area of the tank was removed and stockpiled. The excavation subsequently was backfilled with imported fill and resurfaced to match existing conditions.

The RWQCB publishes a Leaking Underground Fuel Tank (LUFT) manual with guidelines for site assessment, cleanup, and underground storage tank closure. According to the LUFT manual, the action levels for BTEX are 100, 80, 40, and 40 mg/kg, respectively. The reported concentrations of ethylbenzene and xylenes for soil sample EX1-2 are 160 mg/kg each. Also, both samples from the excavation contained elevated concentrations of TPH as gasoline (4900 and 33 mg/kg).

6.0 RECOMMENDATIONS

The analytical results of the soil samples from the tank excavation indicate that soil in the immediate vicinity of the tank has been impacted by petroleum hydrocarbons. Therefore, it is recommended that a work plan be developed to investigate the lateral and vertical extent of petroleum hydrocarbon-affected soil encountered during tank removal activities.

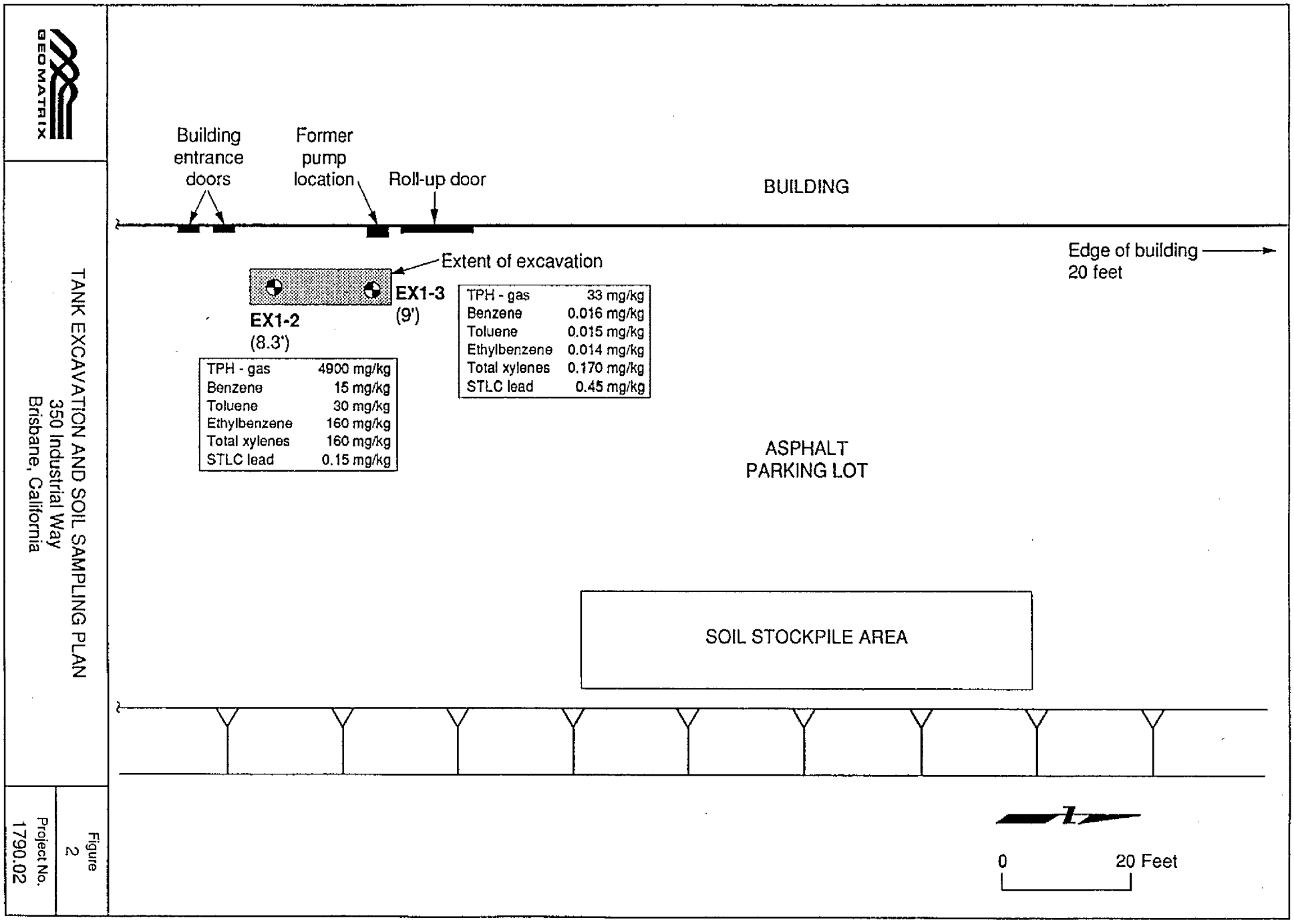


GEOMATRIX

SITE VICINITY MAP
350 Industrial Way
Brisbane, California

Figure
1

Project No.
1790.02


GEOMATRIX
TANK EXCAVATION AND SOIL SAMPLING PLAN
350 Industrial Way
Brisbane, California
Building entrance doors
Former pump location
Roll-up door
BUILDING
Edge of building
20 feet
Extent of excavation
EX1-3
(9')
EX1-2
(8.3')
TPH - gas 33 mg/kg
Benzene 0.016 mg/kg
Toluene 0.015 mg/kg
Ethylbenzene 0.014 mg/kg
Total xylenes 0.170 mg/kg
STLC lead 0.45 mg/kg
TPH - gas 4900 mg/kg
Benzene 15 mg/kg
Toluene 30 mg/kg
Ethylbenzene 160 mg/kg
Total xylenes 160 mg/kg
STLC lead 0.15 mg/kg
ASPHALT
PARKING LOT
SOIL STOCKPILE AREA
0
20 Feet
Project No.
1790.02
Figure
2

GEOMATRIX

APPENDIX A

Permit and Certificate of Disposal

ENVIRONMENTAL SERVICES
(DIVISION OF H&H SHIP SERVICE CO., INC.)

220 CHINA BASIN, SAN FRANCISCO, CA 94107 • DAY AND NIGHT: 543-4835

CERTIFICATE OF DISPOSAL

MARCH 01, 1991

H & H Ship Service Company hereby certifies to TRUMPP BROTHERS

1. The storage tank(s), size(s) ONE (1) 1,000 GALS.

   removed from the KESSLER & KESSLER
   350 INDUSTRIAL WAY
   BRISBANE, CALIFORNIA

   were transported to H & H Ship Service Company, 220 China Basin St., San Francisco, California 94107.

2. The following tank(s), H & H Job Number 7152

   have been steamed cleaned, cut with approximately 2' X 2' holes, rendered harmless and disposed of as scrap metal.

3. Disposal site: SCHNITZER STEEL, OAKLAND, CALIFORNIA.

4. The foregoing method of destruction/disposal is suitable for the materials involved, and fully complies with all applicable regulatory and permit requirements.

5. Should you require further information, please call (415) 543-4835.

Very Truly Yours,

Cleveland Fairey
Operations Coordinator

ENVIRONMENTAL HEALTH PERMIT

San Mateo County Department of Health Services
590 Hamilton Street, Redwood City, CA 94063

ermit to ~~XXXXXXXX~~ CLOSE UNDERGROUND HAZARDOUS
MATERIALS STORAGE TANK - 1 tank @ 550-1000 gal

t 350 Industrial Way
Brisbane, CA 94005

No.	HM-247-91
Date	2/8/91
Fee paid	$313.00 2/6/91
APN	S560022
Ordinance No.	02865

This permit has been granted to:
Kessler & Kessler
20 16th Street
Oakland, CA 94612
ele. 836-4848

ontractor
General Engineering & Construction
540 Industrial Ave.
an Jose, CA 95112
Tele. (408) 292-9820

PERMIT ISSUED BY Dennis Franks

For the Director of
Environmental Health

repared by Sue

THIS PERMIT IS NONTRANSFERABLE AND MUST BE ON JOB SITE
Permit shall be void if construction is not started within 90 days of date of this permit.

cc: CITY OF BRISBANE FIRE & BLDG. DEPTS.

PERMANENT TANK CLOSURE INSPECTION SHEET

SITE NAME: Kessler & Kessler DATE: 2/26/91
ADDRESS: 350 Encinal Ave Alameda
RESPONSIBLE PARTY: Mr. Kessler CONTACT: Kessler
ADDRESS: 520 16th St Oakland 94612 PHONE: 415 836-4846

PRE-INSPECTION INFORMATION HAS PERMIT BEEN ISSUED? __Y __N
PERMIT #

AND SIZE OF TANKS: UL 1/1000 REG D
WO OTHER

REASON FOR REMOVAL: Not in use
DOES HISTORY INDICATE PROBLEM __Y __N Explain No History

DO MONITORING WELLS EXIST ON SITE? __Y X N (indicate on site map)
DEPTH TO GROUNDWATER: 20 Ft

ON-SITE INFORMATION (PREPARE SITE MAP ON SECOND PAGE)

1. IS SITE SAFETY PLAN ON SITE: X Y __N

2. CONDITION OF TANKS AND PIPING: Tank crack still on tank
Hole from corrosion found in tank

3. EVIDENCE OF LEAKAGE? X Y __N Explain Overspill / hole in tank

4. WAS GROUNDWATER ENCOUNTERED IN PIT? __Y X N If so, Depth?
FLOATING PRODUCT? __Y X N SHEEN? __Y X N
WAS WATER SAMPLED? __Y X N PIT PUMPED? __Y X N
VOLUME PUMPED (Approx) X gal

5. INDICATE ON SITE PLAN WHERE SOIL/GW SAMPLES TAKEN

6. ANALYSIS REQUIRED? X 5030 __3550/3510 __8020/8240 __503D&E
__601/624 X TEL __METALS __8010/8240 __8720

7. SAMPLES FROM STOCKPILE TAKEN? __Y __N If so, How Many
VOLUME OF STOCKPILED SOIL? (Approx) cu yds

8. CHAIN OF CUSTODY CHECKED? __Y __N

9. SOIL/GW SAMPLING COMMENTS: Native Soil Dark Clay One Sample under each end

10. WAS PIT OVEREXCAVATED X Y __N Volume? cu yds
(Indicate on site map)

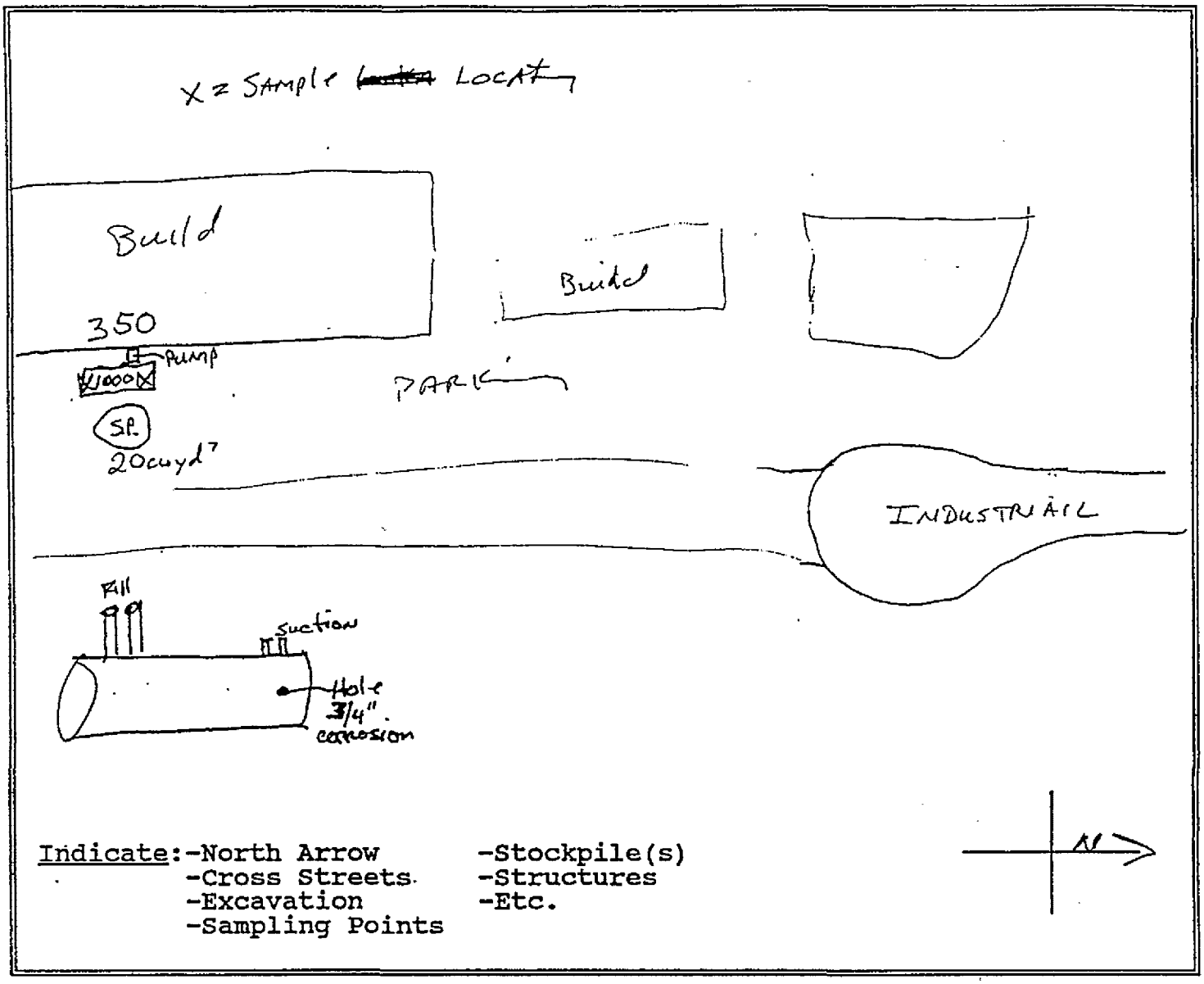
11. TANK MANIFEST #: 9054 6253 RINSATE MANIFEST#: —
PIT WATER MANIFEST#: —

FOLLOW-UP INFORMATION

ANALYSIS RECEIVED? __Y __N COCs, METHODS, ETC. CHECKED? __Y __N
MANIFESTS RECEIVED? __Y __N MANIFEST #s CHECKED? __Y __N
LEAK REPORT FILED? (If Needed) __Y __N

INSPECTOR: Dennis Franks REC
TITLE: Haz Mat Specialist DATE: 2/26/91

SITE MAP



Indicate:-North Arrow -Stockpile(s)
-Cross Streets -Structures
-Excavation -Etc.
-Sampling Points

ADDITIONAL COMMENTS:

TANK 4 YEAR Good on most of TANK
Backfill ~~Be~~ Sand discolored
Native Soil Dark Clay
TANK HAS not been in use for 8 YRS ~~Hole~~ hole in tank may have occured after use stopped
2 Samples w/ odor taken 5.3' and 9.3'
Composite of Stockpile

GEOMATRIX

APPENDIX B

Analytical Laboratory Reports and
Chain-of-Custody Records

CHROMALAB, INC.

Analytical Laboratory
Specializing in GC-GC/MS

- Environmental Analysis
- Hazardous Waste (#E694)
- Drinking Water (#955)
- Waste Water
- Consultation

March 6, 1991 ChromaLab File No.: 0291134

GEOMATRIX CONSULTANTS, INC.

Attn: Mike Rafferty

RE: Three soil samples for Gasoline/BTEX and STLC Lead analyses

Project Number: 1790.02
Date Sampled: Feb. 26, 1991 Date Submitted: Feb. 27, 1991
Date Extracted: March 1-6, 1991 Date Analyzed: March 1-6, 1991

RESULTS:

Sample No.	Gasoline (mg/Kg)	Benzene (µg/Kg)	Toluene (µg/Kg)	Ethyl Benzene (µg/Kg)	Total Xylenes (µg/Kg)	STLC Lead (mg/L)
EX1-2	4900	15000	30000	160000	160000	0.15
EX1-3	33	16	15	14	170	0.45
SP1-1,2,3,4*	3900	4100	75000	22000	120000	0.49
BLANK	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
SPIKE RECOVERY	94.1%	88.8%	84.2%	83.9%	80.9%	96.4%
DUP SPIKE RECOVERY	110.6%	110.8%	81.7%	89.7%	87.1%	101.6%
DETECTION LIMIT	1.0	5.0	5.0	5.0	5.0	0.10
METHOF OF ANALYSIS	5030/ 8015	8020	8020	8020	8020	1310/3010 7420

*Composited soil sample.

ChromaLab, Inc.

David Duong
Chief Chemist

Eric Tam
Laboratory Director

2239 Omega Road, #1 • San Ramon, California 94583
415/831-1788 • Facsimile 415/831-8798
Federal ID #68-0140157

CHROMALAB FILE # 291134

GEOMATRIX CONSULTANTS

ONE MARKET PLAZA
SPEAR STREET TOWER SUITE 717
SAN FRANCISCO, CALIFORNIA 94105
(415) 957-9557

Chain of C

1701

04091

DATE 2-26-91 PAGE 1 OF 1

PROJECT NO. 1790.02

SAMPLERS: (SIGNATURE) Stacy L Arich

DATE	TIME	SAMPLE NUMBER	GENERAL MINERAL	PRIORITY POLLUTANT METALS	EPA METHOD 624	EPA METHOD 625	EPA METHOD 601	EPA METHOD 602	EPA METHOD 608	PETROLEUM HYDROCARBONS		TPH gas	BTEX	Total Lead		NUMBER OF CONTAINERS	REMARKS (SAMPLE PRESERVATION, HANDLING PROCEDURES, OBSERVATIONS, ETC.)
2/26	1425	EX1-2										X	X	X		1	Please composite SP1-1 → SP1-4 prior to analysis
	1435	EX1-3										X	X	X		1	
	1600	SP1-1	COMPOSITE														
	1600	SP1-2										X	X	X		4	Results to Mike Rafferty
	1600	SP1-3															Standard Turnaround Time - 5 day
	1600	SP1-4															LUFT Detection Limits

TOTAL NUMBER OF CONTAINERS: 6

RELINQUISHED BY:	DATE	RECEIVED BY:	RELINQUISHED BY:	DATE	RECEIVED BY: (LAB)
SIGNATURE		SIGNATURE	SIGNATURE: M Rafferty	2-27	SIGNATURE: T. Donovan
PRINTED NAME	TIME	PRINTED NAME	PRINTED NAME: M Rafferty	TIME 2:23	PRINTED NAME
COMPANY		COMPANY	COMPANY: Geomatrix		LABORATORY: Chromalab, Inc.

RELINQUISHED BY:	DATE	RECEIVED BY:
SIGNATURE		SIGNATURE
PRINTED NAME	TIME	PRINTED NAME
COMPANY		COMPANY

METHOD OF SHIPMENT: pickup

LABORATORY COMMENTS / OBSERVATIONS
Rec'd 3:15 2-27-91
Lab T. Donovan

DISTRIBUTION: WHITE, CANARY - LABORATORY, PINK - ORIGINATOR

CHROMALAB, INC.

Analytical Laboratory (E694)

5 DAYS TURNAROUND

May 6, 1991 ChromaLab File No.: 0491164

GEOMATRIX CONSULTANTS, INC.

Attn: Elizabeth Klainer

RE: One composited soil sample for Gasoline/BTEX analysis

Project Number: 1790.02
Date Sampled: April 23, 1991 Date Submitted: April 24, 1991
Date Extracted: May 2, 1991 Date Analyzed: May 2, 1991

RESULTS:

Sample No.	Gasoline (mg/Kg)	Benzene (µg/Kg)	Toluene (µg/Kg)	Ethyl Benzene (µg/Kg)	Total Xylenes (µg/Kg)
SP2-A,B	N.D.	N.D.	N.D.	N.D.	N.D.
BLANK	N.D.	N.D.	N.D.	N.D.	N.D.
SPIKE RECOVERY	100.4%	86.2%	90.7%	87.4%	88.5%
DETECTION LIMIT	1.0	5.0	5.0	5.0	5.0
METHOF OF ANALYSIS	5030/ 8015	8020	8020	8020	8020

ChromaLab, Inc.

David Duong
Chief Chemist

Eric Tam
Laboratory Director

2239 Omega Road, #1 • San Ramon, California 94583
415/831-1788 • Facsimile 415/831-8798
Federal ID #68-0140157

CHROMALAB FILE # 491164

GEOMATRIX CONSULTANTS

ONE MARKET PLAZA
SPEAR STREET TOWER SUITE 717
SAN FRANCISCO, CALIFORNIA 94105
(415) 957-9557

Chain of [illegible] 2125

DATE 4/23/91 PAGE 1 OF 1

PROJECT NO. 1790.02

SAMPLERS: (SIGNATURE) Elizabeth Klainer

DATE	TIME	SAMPLE NUMBER	GENERAL MINERAL	PRIORITY POLLUTANT METALS	EPA METHOD 624	EPA METHOD 625	EPA METHOD 601	EPA METHOD 602	EPA METHOD 608	PETROLEUM HYDROCARBONS				HOLD	NUMBER OF CONTAINERS
4/23	1250	SP2-A												X	1
4/23	1250	SP2-B												X	1

ANALYSES

REMARKS (SAMPLE PRESERVATION, HANDLING PROCEDURES, OBSERVATIONS, ETC.)

Hold samples. We will call 4/24 with instructions.

TOTAL NUMBER OF CONTAINERS 2

RELINQUISHED BY:	DATE	RECEIVED BY:	RELINQUISHED BY:	DATE	RECEIVED BY: (LAB)
Elizabeth Klainer	4/23/91	T. Donovan		4-23	T. Donovan
SIGNATURE: Elizabeth Klainer	TIME: 1442	SIGNATURE: TARA DONOVAN	SIGNATURE	TIME: 5:30	SIGNATURE
PRINTED NAME: Geomatrix		PRINTED NAME: Chromalab	PRINTED NAME		PRINTED NAME: Chromalab, INC.
COMPANY		COMPANY	COMPANY		LABORATORY

RELINQUISHED BY:	DATE	RECEIVED BY:
SIGNATURE		SIGNATURE
PRINTED NAME	TIME	PRINTED NAME
COMPANY		COMPANY

METHOD OF SHIPMENT: Pickup

LABORATORY COMMENTS / OBSERVATIONS

DISTRIBUTION: WHITE, CANARY - LABORATORY, PINK - ORIGINATOR

APPENDIX C
Characteristics of Chemicals Used On Site

TABLE C - 1
PROPERTIES OF CHEMICALS USED ONSITE
INDUSTRIAL WAY PROPERTIES

		CHARACTERISTICS						
CHEMICAL	COMPOSITION	COLOR	ODOR	BOILING POINT ^{o}C	SOLUBILITY IN WATER	LD_{50}	COMMENTS	ASSUMED PHYSICAL STATE AT TIME OF USE
ACETIC ACID	$C_2 H_4 O_2$	Colorless	Sour/ Vinegar-like	118	Miscible	-	Produces skin burns, flammable, combustible	Liquid
ACETONE	$C_3 H_6 O$	Colorless	Characteristic odor	56.5	Miscible	10.7 ml/kg	Volatile, highly flammable	Liquid
ACETYLENE GAS	$C_2 H_2$	Colorless	Characteristic	-	-	-	Explosive, asphyxiant	Gas
ARGON	Ar	Colorless	Odorless	-185.86	Soluble	-	Inert	Gas
CALCIUM SULFATE	CaO_4S	Varies	Odorless	-	Soluble	-	Non-hazardous	Solid
CHROMIUM (CHROMIC SULFATE)	$Cr_2 O_{12} S_3$	Peach; hydrated form is green	-	-	Insoluble; Readily soluble (hydrated)	-	Used in tanning industry	Sulfuric acid/chromium solution (liquid)
DIPENTANE	$C_{10} H_{16}$	-	Lemon	175.5	Insoluble	-	Derived from oil of lemon, orange, caraway. Used as wetting agent, solvent	Liquid
ETHYLENE GLYCOL	$C_2 H_6 O_2$			197.6	Miscible	8.54g/kg	Hazardous/lethal when ingested	Liquid

TABLE C - 1
PROPERTIES OF CHEMICALS USED ONSITE
INDUSTRIAL WAY PROPERTIES

		CHARACTERISTICS						
CHEMICAL	COMPOSITION	COLOR	ODOR	BOILING POINT ^{o}C	SOLUBILITY IN WATER	LD_{50}	COMMENTS	ASSUMED PHYSICAL STATE AT TIME OF USE
GASOLINE	Mixture of C_4 to C_{12} hydrocarbons	-	Characteristic odor	Varies	Insoluble	-	Evaporates quickly, flammable	Liquid
HYDROGEN PEROXIDE	$H_2 O_2$	Colorless	Slightly sharp odor	152	Miscible	-	Non-combustible, powerful oxidizer, caustic to skin	Liquid
ISOPROPYL ALCOHOL	$C_3 H_8O$	Colorless	Odor similar to alcohol	82.5	Miscible	5.8g/kg	Flammable liquid	Liquid
PROPANE	$C_3 H_8$	Colorless	Odorless	Varies	-	-	Flammable	Gas
SANTOBRITE	-	-	-	-	-	-	See attached MSDS	-
SODIUM FORMALDEHYDE-SULFOXYLATE	$CH_3 Na O_3 S$	-	Garlic	-	Freely soluble	4.0g/kg	Used in vat color printing pastes	Liquid
SODIUM HEXAMETAPHOSPHATE	$(Na PO_3)_x$	-	-	-	Soluble	-	Water softeners and detergents "Calgon"	Liquid
SODIUM HYDROSULFITE	$Na_2 S_2O_4$	White to Grey-white	Slight odor	-	Very soluble in water	-	Oxidizes in air	Solid
SODIUM HYDROXIDE	NaOH	Colorless to white	Odorless	Varies	111%	500mg/kg	Corrosive; caustic	Liquid

TABLE C - 1
PROPERTIES OF CHEMICALS USED ONSITE
INDUSTRIAL WAY PROPERTIES

		CHARACTERISTICS						
CHEMICAL	COMPOSITION	COLOR	ODOR	BOILING POINT ^{o}C	SOLUBILITY IN WATER	LD_{50}	COMMENTS	ASSUMED PHYSICAL STATE AT TIME OF USE
SODIUM HYPOCHLORITE SOLUTION (bleach)	ClNaO	Colorless	Chlorine Odor	-	-	-	Ingestion, inhalation and skin irritant hazards	Liquid
SULFURIC ACID	$H_2 SO_4$	Clear to colorless	Odorless	290	Miscible, affinity for water	2.14g/kg	Very corrosive, ingestion, inhalation hazard	Liquid
TRIETHANOLAMINE	$C_6 H_{15} NO_3$	-	Ammonia	-335.4	Soluble	-	Solvent for dyes	Liquid
ZINC SULFATE	$Zn SO_4$	Colorless	Odorless	-	Soluble in water	-	Irritating to the skin, mucous membrane	Solid

Note: Chemical data obtained from The Merck Index, Eleventh Edition, 1989.

Vulcan CHEMICALS

A DIVISION OF
VULCAN MATERIALS COMPANY

P.O. BOX 530390
BIRMINGHAM, ALABAMA 35253-0390
(205) 877-3000

RECEIVED
MAR 1 1993
TREADWELL & ROLLO

February 25, 1993

Ms. Sharon Eckard
Treadwell and Rollo
353 Sacramento Street
Suite 800
San Francisco, CA 94111

Dear Ms. Eckard:

As you requested, we are enclosing our Material Safety Data Sheet (MSDS) for Pentachlorophenol. This MSDS complies with the OSHA Hazard Communication Standard. We hope this information will be helpful to you.

If we can be of any additional assistance, please do not hesitate to call.

Sincerely,

Larry D. Jones
Technical & Environmental
Services Representative

pmp

Enclosures

c: Matt Werger

C:\WP51\LDJ\FEB93\TREADWEL

Vulcan CHEMICALS

MATERIAL SAFETY DATA SHEET

24 Hour Emergency Phone (316) 524-5751

Division of Vulcan Materials Company / P. O. Box 530390 • Birmingham, AL 35253-0390

I – IDENTIFICATION

CHEMICAL NAME	CHEMICAL FORMULA	MOLECULAR WEIGHT
Pentachlorophenol	C_6Cl_5OH	266.32

TRADE NAME
GLAZD® Penta, Block Penta

SYNONYMS	DOT IDENTIFICATION NO.
Penta, PCP, Technical Grade PCP	NA 9188

II– PRODUCT AND COMPONENT DATA

COMPONENT(S) CHEMICAL NAME	CAS REGISTRY NO.	% (wt.) Approx.	OSHA PEL
* Pentachlorophenol	87-86-5	90-94	0.5 mg/m^3
2, 3, 4, 6-Tetrachlorophenol	58-90-2	0-1.5	None
Hydroxypolychlorodibenzo Ethers		4-7	None

For additional information refer to note in Section VI, Chronic Toxicity.

NOTE: The hazards of this product are based on studies on this or similar products.

* Denotes chemical subject to reporting requirements of Section 313 of Title III of the 1986 Superfund Amendments and Reauthorization Act (SARA) and 40 CFR Part 372

III – PHYSICAL DATA

APPEARANCE AND ODOR	SPECIFIC GRAVITY
Light brown or tan flake or solid	Flake bulk density = 70 lbs/ft^3
BOILING POINT	**VAPOR DENSITY IN AIR (Air = 1)**
310°C (Melting Point: 190°C)	N/A
VAPOR PRESSURE	**% VOLATILE, BY VOLUME**
N/A	0
EVAPORATION RATE	**SOLUBILITY IN WATER**
N/A	14 ppm @ 20°C

IV – REACTIVITY DATA

STABILITY	CONDITIONS TO AVOID
Stable	Avoid contact with open flame, electric arcs, or other hot surfaces which can cause thermal decomposition.

INCOMPATIBILITY (Materials to avoid)

Strong oxidizers and alkalies.

HAZARDOUS DECOMPOSITION PRODUCTS

Hydrogen chloride, chlorine, chlorinated hydrocarbons

HAZARDOUS POLYMERIZATION

Will not occur

V - FIRE AND EXPLOSION HAZARD DATA

FLASHPOINT (Method used)	FLAMMABLE LIMITS IN AIR
None	None

EXTINGUISHING AGENTS

None NFPA Hazard Ratings: Health 3, Flammability 0, Reactivity 0

UNUSUAL FIRE AND EXPLOSION HAZARDS

Toxic gases are formed by thermal decomposition. Firefighters should wear self contained positive pressure breathing apparatus, and avoid skin contact.

VI - TOXICITY AND FIRST AID

EXPOSURE LIMITS (When exposure to this product and other chemicals is concurrent, the exposure limit must be defined in the workplace.)

ACGIH: 0.5 mg/m^3 8 hour TWA
OSHA: 0.5 mg/m^3 8 hour TWA
(skin absorption possible)

ACGIH Biological Exposure Indices
(2 mg/L urine)
(5 mg/L plasma)

Effects described in this section are believed not to occur if exposures are maintained at or below appropriate TLVs.
Because of the wide variation in individual susceptibility, these exposure limits may not be applicable to all persons and those with medical conditions listed below.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE

Acute or chronic kidney or liver disease, asthma, bronchitis, chronic acne and other skin conditions.

ACUTE TOXICITY Primary route(s) of exposure: ☒ Inhalation ☒ Skin Absorption ☐ Ingestion

Inhalation: Concentrations of 0.3 mg/m^3 can cause nose irritation. Concentrations above 1 mg/m^3 can cause irritation of upper respiratory tract with sneezing and coughing. Persons acclimated to pentachlorophenol can tolerate levels above 2 mg/m^3. Symptoms of overexposure include rapid heartbeat and respiration, elevated temperature and blood pressure, muscular weakness, excessive sweating, dizziness and nausea. High concentrations can cause unconciousness, convulsions and death generally from cardiac arrest.

Skin: Pentachlorophenol is readily absorbed through intact skin. Pentachlorophenol in solution can be readily absorbed through intact skin in toxic amounts, causing systemic poisoning and symptoms described in the Inhalation section. Pentachlorophenol on the skin can cause irritation.

Eyes: Pentachlorophenol causes irritation of the eyes at 1 mg/m^3. If exposure is prolonged, slight transient corneal damage can occur.

Ingestion: Single dose toxicity is high. Symptoms of ingestion are those described in the Inhalation section.

Chloracne: In humans, the absorption of pentachlorophenol by any route may result in the development of the skin condition, chloracne. This usually appears as blackheads, whiteheads and yellow cysts over the temples and around the ears. In severe cases, involvement may be extensive. Mild cases may be similar in appearance to other forms of acne and to skin changes commonly seen with aging.

FIRST AID

Inhalation: Move victim to fresh air. If breathing has stopped, administer artificial respiration. Call a physician.
Skin: Remove contaminated clothing and shoes. Wash skin thoroughly with soap and water for at least 15 minutes. Wash contaminated clothing before reuse.
Eyes: Flush eyes immediately with water for at least 15 minutes. Contact a physician.
Ingestion: Call a physician or Poison Control Center immediately. If possible, vomiting should be induced under medical supervision. Drink one or two glasses of water and induce vomiting by touching the back of throat with finger. Do not induce vomiting or give anything by mouth to an unconscious person.
NOTE TO PHYSICIAN: This product is a metabolic stimulant. Treatment is supportive. Forced diuresis may be effective to reduce total body burden. Treat hyperthermia with physical measures. Do not administer aspirin, phenothiazines, or atropine since they may enhance toxicity.

CHRONIC TOXICITY

The finding of chronic toxic effects in laboratory animals may indicate toxicity to humans. Overexposure should be avoided, failure to do so could result in injury, illness or even death. Chronic overexposure to technical grade pentachlorophenol has caused liver and kidney toxic effects in experimental animals.

Carcinogenicity: Technical Grade Pentachlorophenol has been evaluated for possible cancer causing effects in laboratory animals. The National Toxicology Program fed up to 400 ppm Technical Grade (TG) penta and up to 600 ppm "purified" penta to mice, 5 days a week for 106 weeks. A statistically significant increased incidence of liver tumors and endrocrine tumors was observed in male mice. A significant increase in liver tumors was not seen in female mice fed TG penta and was seen only at the highest dose for "purified" penta. Vascular tumors were also observed in female mice. Rats exposed by ingestion to concentrations up to 30 mg/kg/day for 2 years and two strains of mice exposed by ingestion to concentrations up to 46.4 mg/kg/day did not show an increase incidence in tumors. Two strains of mice were also tested by having Technical Grade Pentachlorophenol subcutaneously injected. These mice did not show an increased incidence of tumors. Pentachlorophenol, 2,3,4,6-tetrachlorophenol and hydroxypolychlorodibenzo ethers are not listed on the IARC, NTP or OSHA carcinogen lists.

Reproductive Toxicity: Reproductive toxicity tests have been conducted to evaluate the potential adverse effects technical grade and purified pentachlorophenol may have on reproduction and offspring of laboratory animals. Both technical and purified pentachlorophenol have been found to be embryo and fetotoxic to rats, but not to hamsters. Neither technical grade nor purified pentachlorophenol caused teratogenic effects (birth defects), but did cause delays in normal fetal development. The U.S. EPA has expressed the opinion that pentachlorophenol can produce defects in the offspring of laboratory animals. Exposure to pentachlorophenol during pregnancy should be avoided.

Note: This product contains trace quantities of hexa, hepta and octachlorodibenzo-p-dioxins, hexa, hepta and octchlorodibenzofurans and hexachlorobenzene. The state of California has listed hexachlorodibenzo dioxin and hexachlorobenzene under Proposition 65 as chemicals known to the state to cause cancer. If further information is desired, contact Vulcan Chemicals Technical Service Department.

VII - PERSONAL PROTECTION AND CONTROLS

RESPIRATORY PROTECTION

Where concentrations of pentachlorophenol exceeds or are likely to exceed .5 mg/m^3, a NIOSH/MSHA approved organic vapor-dust filter type respirator is acceptable. A NIOSH/MSHA approved self-contained breathing apparatus or air line respirator, with full face piece, is required for concentrations above 150.0 mg/m^3, or during emergency and spills. Follow applicable respirator use standards and regulations.

VENTILATION

Do not use in closed or confined space. Open doors and/or windows. Use ventilation to maintain exposure levels below 0.5 mg/m^3

SKIN PROTECTION Wear PVC, neoprene, nitrile latex or equivalent gloves and tightly woven clothing including long sleeve shirt when handling flake or solid penta. When mixing penta solutions, wear protective clothing, gloves and boots or shoes, which are suitable for the solvent being used.

EYE PROTECTION

Wear safety glasses. Contact lenses should not be worn. When mixing penta solutions, wear chemical goggles and/or face shield.

HYGIENE

Avoid contact with skin and breathing dust. Do not eat, drink, or smoke in work area. Wash hands prior to eating, drinking or using restroom. Change into uncontaminated clothing before leaving work premises. (Refer to Section VIII).

OTHER CONTROL MEASURES

To determine the exposure level(s), monitoring should be performed regularly. Safety shower and eye wash station should be available. Note: Protective equipment and clothing should be selected, used, and maintained according to applicable standards and regulations. For further information, contact the clothing or equipment manufacturer or the Vulcan Chemicals Technical Service Department.

VIII – STORAGE AND HANDLING PRECAUTIONS

Follow protective controls set forth in Section VII when handling this product.
Thoroughly wash potentially contaminated clothing before reuse. Do not launder work clothes with other non-contaminated clothes and/or household laundry. Contaminated clothing, boots or equipment should not be taken home.
Store in properly labeled containers in dry, well ventilated secure area. Do not remove or deface label. Do not reuse drums for any purpose.
Container Disposal: Completely empty drum or liner into application equipment. Triple rinse or clean empty drums, liners and block wrappings in accordance with 40 CFR 261.7(b)(3) prior to offering for reconditioning, recycling or other disposal. For guidance, contact the nearest EPA regional office or State Agency authorized to administer the Resource Conservation and Recovery Act (RCRA).

SARA Title III Hazard Categories: Immediate Health, Delayed Health

IX – SPILL, LEAK AND DISPOSAL PRACTICES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Ventilate spill area and avoid breathing dust or vapors. Clean up spilled material (wear protective equipment - See Section VII) and place in closed container for normal use if possible or proper disposal. Penta is toxic to fish and wildlife; do not allow to contaminate ground or surface waters. Reportable Quantity (RQ) is 10 lbs. Notify National Response Center (800/424-8802) of uncontrolled spills in excess of RQ.

WASTE DISPOSAL METHOD

Pesticide Disposal: Pesticide wastes are acutely hazardous. Improper disposal of excess pesticide, spray mixture or rinsate is a violation of federal law. If these wastes cannot be disposed of by use according to label instructions, contact your State Pesticide or Environmental Control Agency, or the Hazardous Waste representative at the nearest EPA regional office for guidance.

X – TRANSPORTATION

DOT HAZARD CLASSIFICATION

Chlorophenols, Solid, 6.1, UN 2020, PG III, RQ (Pentachlorophenol)

PLACARD REQUIRED

KEEP AWAY FROM FOOD, 2020, Class 6

LABEL REQUIRED

KEEP AWAY FROM FOOD, Class 6
Label as required by EPA and by OSHA Hazard Communication Standard, and any applicable state and local regulations.

Medical Emergencies

Call collect 24 hours a day for emergency toxicological information 415/821-5338

Other Emergency information

Call 316/524-5751 (24 hours)

For any other information contact:

Vulcan Chemicals
Technical Service Department
P.O. Box 530390
Birmingham, AL 35253-0390
800/873-4898
8 AM to 5 PM Central Time
Monday Through Friday

DATE OF PREPARATION: December 1, 1992

NOTICE: Vulcan Chemicals believes that the information contained on this Material Safety Data Sheet is accurate. The suggested procedures are based on experience as of the date of publication. They are not necessarily all-inclusive nor fully adequate in every circumstance. Also, the suggestions should not be confused with nor followed in violation of applicable laws, regulation, rules or insurance requirements.

NO WARRANTY IS MADE, EXPRESS OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR OTHERWISE.

Genium Publishing Corporation
1145 Catalyn Street
Schenectady, NY 12303-1836 USA
(518) 377-8854

Material Safety Data Sheets Collection:

Sheet No. 467
Automotive Gasoline, Lead-free

Issued: 10/81 Revision: A, 9/91

Section 1. Material Identification

35

Automotive Gasoline, Lead-free, Description: A mixture of volatile hydrocarbons composed mainly of branched-chain paraffins, cycloparaffins, olefins, naphthenes, and aromatics. In general, gasoline is produced from petroleum, shale oil, Athabasca tar sands, and coal. Motor gasolines are made chiefly by cracking processes, which convert heavier petroleum fractions into more volatile fractions by thermal or catalytic decomposition. Widely used as fuel in internal combustion engines of the spark-ignited, reciprocating type. Automotive gasoline has an octane number of approximately 90. A high content of aromatic hydrocarbons and a consequent high toxicity are also associated with a high octane rating. Some gasolines sold in the US contain a minor proportion of tetraethyllead, which is added in concentrations not exceeding 3 ml per gallon to prevent engine "knock." However, methyl-tert-butyl ether (MTBE) has almost completely replaced tetraethyllead.

R 1
I 2
S 2*
K 4
* Skin absorption

NFPA



HMIS
H 2
F 3
R 1
PPG†
† Sec. 8

Other Designations: CAS No. 8006-61-9, benzin, gasoline, gasolene, motor spirits, natural gasoline, petrol.
Manufacturer: Contact your supplier or distributor. Consult latest *Chemical Week Buyers' Guide*(73) for a suppliers list.

Cautions: Inhalation of automotive gasoline vapors can cause intense burning in throat and lungs, central nervous system (CNS) depression, and possible fatal pulmonary edema. Gasoline is a dangerous fire and explosion hazard when exposed to heat and flames.

Section 2. Ingredients and Occupational Exposure Limits

Automotive gasoline, lead-free*

1990 OSHA PELs
8-hr TWA: 300 ppm, 900 mg/m³
15-min STEL: 500 ppm, 1500 mg/m³

1990-91 ACGIH TLVs
TWA: 300 ppm, 890 mg/m³
STEL: 500 ppm, 1480 mg/m³

1990 NIOSH REL
None established

1985-86 Toxicity Data*
Man, inhalation, TC_{Lo}: 900 ppm/1 hr; toxic effects include sense organs and special senses (conjunctiva irritation), behavioral (hallucinations, distorted perceptions), lungs, thorax, or respiration (cough)
Human, eye: 140 ppm/8 hr; toxic effects include mild irritation
Rat, inhalation, LC_{50}: 300 g/m³/5 min

* A typical modern gasoline composition is 80% paraffins, 14% aromatics, and 6% olefins. The mean benzene content is approximately 1%. Other additives include sulfur, phosphorus, and MTBE.
† See NIOSH, *RTECS* (LX3300000), for additional toxicity data.

Section 3. Physical Data

Boiling Point: Initially, 102 °F (39 °C); after 10% distilled, 140 °F (60 °C); after 50% distilled, 230 °F (110 °C); after 90% distilled, 338 °F (170 °C); final boiling point, 399 °F (204 °C)
Vapor Density (air = 1): 3.0 to 4.0
Density/Specific Gravity: 0.72 to 0.76 at 60 °F (15.6 °C)
Water Solubility: Insoluble

Appearance and Odor: A clear (gasoline may be colored with dye), mobile liquid with a characteristic odor recognizable at about 10 ppm in air.

Section 4. Fire and Explosion Data

Flash Point: -45 °F (-43 °C)	Autoignition Temperature: 536 to 853 °F (280 to 456 °C)	LEL: 1.3% v/v	UEL: 6.0% v/v

Extinguishing Media: Use dry chemical, carbon dioxide, or alcohol foam as extinguishing media. Use of water may be ineffective to extinguish fire, but use water spray to knock down vapors and to cool fire-exposed drums and tanks to prevent pressure rupture. Do not use a solid stream of water since it may spread the fuel.
Unusual Fire or Explosion Hazards: Automobile gasoline is an OSHA Class IB flammable liquid and a dangerous fire and explosion hazard when exposed to heat and flames. Vapors can flow to an ignition source and flash back. Automobile gasoline can also react violently with oxidizing agents.
Special Fire-fighting Procedures: Isolate hazard area and deny entry. Since fire may produce toxic fumes, wear a self-contained breathing apparatus (SCBA) with a full facepiece operated in pressure-demand or positive-pressure mode, and full protective clothing. When the fire is extinguished, use nonsparking tools for cleanup. Be aware of runoff from fire control methods. Do not release to sewers or waterways.

Section 5. Reactivity Data

Stability/Polymerization: Automotive gasoline is stable at room temperature in closed containers under normal storage and handling conditions. Hazardous polymerization cannot occur.
Chemical Incompatibilities: Automotive gasoline can react with oxidizing materials such as peroxides, nitric acid, and perchlorates.
Conditions to Avoid: Avoid heat and ignition sources.
Hazardous Products of Decomposition: Thermal oxidative decomposition of automotive gasoline can produce oxides of carbon and partially oxidized hydrocarbons.

Copyright © 1991 Genium Publishing Corporation.
Any commercial use or reproduction without the publisher's permission is prohibited.

Section 6. Health Hazard Data

Carcinogenicity: In 1990 reports, the IARC list gasoline as a possible human carcinogen (Group 2B). Although the IARC has assigned an overall evaluation to gasoline, it has not assigned an overall evaluation to specific substances within this group (inadequate human evidence).
Summary of Risks: Gasoline vapors are considered moderately poisonous. Vapor inhalation can cause central nervous system (CNS) depression and mucous membrane and respiratory tract irritation. Brief inhalations of high concentrations can cause a fatal pulmonary edema. Reported responses to gasoline vapor concentrations are: 160 to 270 ppm causes eye and throat irritation in several hours; 500 to 900 ppm causes eye, nose, and throat irritation, and dizziness in 1 hr; and 2000 ppm produces mild anesthesia in 30 min. Higher concentrations are intoxicating in 4 to 10 minutes. If large areas of skin are exposed to gasoline, toxic amounts may be absorbed. Repeated or prolonged skin exposure causes dermatitis. Certain individuals may develop hypersensitivity. Ingestion can cause CNS depression. Pulmonary aspiration after ingestion can cause severe pneumonitis. In adults, ingestion of 20 to 50 g gasoline may produce severe symptoms of poisoning.
Medical Conditions Aggravated by Long-Term Exposure: None reported.
Target Organs: Skin, eye, respiratory and central nervous systems.
Primary Entry Routes: Inhalation, ingestion, skin contact.
Acute Effects: Acute inhalation produces intense nose, throat, and lung irritation; headaches; blurred vision; conjunctivitis; flushing of the face; mental confusion; staggering gait; slurred speech; and unconsciousness, sometimes with convulsions. Ingestion causes inebriation (drunkenness), vomiting, dizziness, fever, drowsiness, confusion, and cyanosis (a blue to dark purplish coloration of skin and mucous membrane caused by lack of oxygen). Aspiration causes choking, cough, shortness of breath, increased rate of respiration, excessively rapid heartbeat, fever, bronchitis, and pneumonitis. Other symptoms following acute exposure include acute hemorrhage of the pancreas, fatty degeneration of the liver and kidneys, and passive congestion of spleen.
Chronic Effects: Chronic inhalation results in appetite loss, nausea, weight loss, insomnia, and unusual sensitivity (hyperesthesia) of the distal extremities followed by motor weakness, muscular degeneration, and diminished tendon reflexes and coordination. Repeated skin exposure can cause blistering, drying, and lesions.
FIRST AID
Eyes: Gently lift the eyelids and flush immediately and continuously with flooding amounts of water until transported to an emergency medical facility. Consult a physician immediately.
Skin: *Quickly* remove contaminated clothing. Rinse with flooding amounts of water for at least 15 min. For reddened or blistered skin, consult a physician. Wash affected area with soap and water.
Inhalation: Remove exposed person to fresh air and support breathing as needed.
Ingestion: Never give anything by mouth to an unconscious or convulsing person. If ingested, *do not induce vomiting* due to aspiration hazard. Give conscious victim a mixture of 2 tablespoons of activated charcoal mixed in 8 oz of water to drink. Consult a physician immediately.
After first aid, get appropriate in-plant, paramedic, or community medical support.

Section 7. Spill, Leak, and Disposal Procedures

Spill/Leak: Notify safety personnel, evacuate all unnecessary personnel, remove heat and ignition sources, and provide maximum explosion-proof ventilation. Cleanup personnel should protect against vapor inhalation and liquid contact. Use nonsparking tools. Take up small spills with sand or other noncombustible adsorbent. Dike storage areas to control leaks and spills. Follow applicable OSHA regulations (29 CFR 1910.120).
Aquatic Toxicity: Bluegill, freshwater, LC_{50}, 8 ppm/96 hr.
Disposal: Contact your supplier or a licensed contractor for detailed recommendations. Follow applicable Federal, state, and local regulations.
EPA Designations
RCRA Hazardous Waste (40 CFR 261.21): Characteristic of ignitability
CERCLA Hazardous Substance (40 CFR 302.4): Not listed
SARA Extremely Hazardous Substance (40 CFR 355): Not listed
SARA Toxic Chemical (40 CFR 372.65): Not listed
OSHA Designations
Listed as an Air Contaminant (29 CFR 1910.1000, Table Z-1-A)

Section 8. Special Protection Data

Goggles: Wear protective eyeglasses or chemical safety goggles, per OSHA eye- and face-protection regulations (29 CFR 1910.133). Since contact lens use in industry is controversial, establish your own policy.
Respirator: Seek professional advice prior to respirator selection and use. Follow OSHA respirator regulations (29 CFR 1910.134) and, if necessary, wear a NIOSH-approved respirator. There are no specific NIOSH recommendations. However, for vapor concentrations not immediately dangerous to life or health, use chemical cartridge respirator equipped with organic vapor cartridge(s), or a supplied-air respirator. For emergency or nonroutine operations (cleaning spills, reactor vessels, or storage tanks), wear an SCBA. *Warning! Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.*
Other: Wear impervious gloves, boots, aprons, and gauntlets to prevent prolonged or repeated skin contact. Materials such as neoprene or polyvinyl alcohol provide excellent/good resistance for protective clothing. Note: Resistance of specific materials can vary from product to product.
Ventilation: Provide general and local explosion-proof exhaust ventilation systems to maintain airborne concentrations below the OSHA PELs (Sec. 2). Local exhaust ventilation is preferred since it prevents contaminant dispersion into the work area by controlling it at its source.[103]
Safety Stations: Make available in the work area emergency eyewash stations, safety/quick-drench showers, and washing facilities.
Contaminated Equipment: Remove this material from your shoes and equipment. Launder contaminated clothing before wearing.
Comments: Never eat, drink, or smoke in work areas. Practice good personal hygiene after using this material, especially before eating, drinking, smoking, using the toilet, or applying cosmetics.

Section 9. Special Precautions and Comments

Storage Requirements: Store in closed containers in a cool, dry, well-ventilated area away from heat and ignition sources and strong oxidizing agents. Protect containers from physical damage. Avoid direct sunlight. Storage must meet requirements of OSHA Class IB liquid. Outside or detached storage preferred.
Engineering Controls: Avoid vapor inhalation and skin or eye contact. Consider a respiratory protection program that includes regular training, maintenance, inspection, and evaluation. Indoor use of this material requires explosion-proof exhaust ventilation to remove vapors. Only use gasoline as a fuel source due to its volatility and flammable/explosive nature. Practice good personal hygiene and housekeeping procedures. Wear clean work clothing daily.

Transportation Data (49 CFR 172.101, .102)

DOT Shipping Name: Gasoline (*including casing-head and natural*)
DOT Hazard Class: Flammable liquid
ID No.: UN1203
DOT Label: Flammable liquid
DOT Packaging Exceptions: 173.118
DOT Packaging Requirements: 173.119

IMO Shipping Name: Gasoline
IMO Hazard Class: 3.1
ID No.: UN1203
IMO Label: Flammable liquid
IMDG Packaging Group: II

MSDS Collection References: 26, 73, 89, 100, 101, 103, 124, 126, 127, 132, 133, 136, 138, 140, 143, 146, 153, 159
Prepared by: M Allison, BS; Industrial Hygiene Review: DJ Wilson, CIH; Medical Review: W Silverman, MD; Edited by: JR Stuart, MS

Copyright © 1991 by Genium Publishing Corporation. Any commercial use or reproduction without the publisher's permission is prohibited. Judgments as to the suitability of information herein for the purchaser's purposes are necessarily the purchaser's responsibility. Although reasonable care has been taken in the preparation of such information, Genium Publishing Corporation extends no warranties, makes no representations, and assumes no responsibility as to the accuracy or suitability of such information for application to the purchaser's intended purpose or for consequences of its use.

Genium Publishing Corporation
1145 Catalyn Street
Schenectady, NY 12303-1836 USA
(518) 377-8854

Material Safety Data Sheets Collection:

Sheet No. 713
Lead (Inorganic)

Issued: 8/90

Section 1. Material Identification

Lead (Inorganic) (Pb) Description: Exists widely throughout the world in a number of ores. Its main commercial source is galena (lead sulphide). Lead mineral is separated from crude ores by blast-furnace smelting, drossing, or electrolytic refining. Lead is used mostly in manufacturing storage batteries. Other uses are in manufacturing tetraethyllead and both organic and inorganic lead compounds in ceramics, plastics, and electronic devices; in producing ammunition, solder, cable covering, sheet lead, and other metal products (brass, pipes, caulking); in metallurgy; in weights and as ballast; as a chemical intermediate for lead alkyls and pigments; as a constuction material for the tank linings, piping, and equipment used to handle the corrosive gases and liquids used in sulfuric acid manufacturing, petroleum refining, halogenation, sulfonation, extraction, and condensation; and for x-ray and atomic radiation protection.
Other Designations: CAS No. 7439-92-1, lead oxide; lead salts, inorganic; metallic lead; plumbum.
Manufacturer: Contact your supplier or distributor. Consult the latest *Chemicalweek Buyers' Guide*(73) for a suppliers list.

R	0
I	4
S	-
K	0

Genium



HMIS
H 3
F 1
R 0
PPG*

Cautions: *Inorganic lead is a potent systemic poison.* Organic lead (for example, tetraethyl lead) has severe, but different, health effects. Occupational lead poisoning is due to inhalation of dust and fumes. Major affected organ systems are the nervous, blood, and reproductive systems, and kidneys. Health impairment or disease may result from a severe acute short- or long-term exposure.

* Sec. 8

Section 2. Ingredients and Occupational Exposure Limits

Lead (inorganic) fumes and dusts, as Pb, ca 100%

1989 OSHA PELs (Lead, Inorganic compounds)
8-hr TWA: 50 µg/m³
Action Level TWA*: 30 µg/m³

1989-90 ACGIH TLV (Lead, Inorganic, fumes and dusts)
TLV-TWA: 150 µg/m³

1985-86 Toxicity Data†
Human, inhalation, TC_{Lo}: 10 µg/m³ affects gastrointestinal tract and liver
Human, oral, TD_{Lo}: 450 mg/kg ingested over 6 yr affects peripheral and central nervous systems
Rat, oral, TD_{Lo}: 790 mg/kg affects multigeneration reproduction

29 CFR 1910.1025 Lead Standard
Blood Lead Level: 40 µg/100 g

1988 NIOSH REL
10-hr TWA: <100 µg/m³

* Action level applies to employee exposure without regard to respirator use.
† See NIOSH, *RTECS* (OF7525000), for additional mutative, reproductive, and toxicity data.

Section 3. Physical Data

Boiling Point: 3164 °F (1740 °C)
Melting Point: 621.3 °F (327.4 °C)
Vapor Pressure: 1.77 mm Hg at 1832 °F (1000 °C)
Viscosity: 3.2 cp at 621.3 °F (327.4 °C)
Molecular Weight: 207.20
Specific Gravity (20 °C/4 °C): 11.34
Water Solubility: Relatively insoluble in hot or cold water*

Appearance and Odor: Bluish-white, silvery, gray, very soft metal.

* Lead dissolves more easily at a low pH.

Section 4. Fire and Explosion Data

Flash Point: None reported	Autoignition Temperature: None reported	LEL: None reported	UEL: None reported

Extinguishing Media: Use dry chemical, carbon dioxide, water spray, or foam to extinguish fire.
Unusual Fire or Explosion Hazards: Flammable and moderately explosive in the form of dust when exposed to heat or flame.
Special Fire-fighting Procedures: Isolate hazard area and deny entry. Since fire may produce toxic fumes, wear a self-contained breathing apparatus (SCBA) with a full facepiece operated in the pressure-demand or positive-pressure mode and full protective equipment. Be aware of runoff from fire control methods. Do not release to sewers or waterways.

Section 5. Reactivity Data

Stability/Polymerization: Lead is stable at room temperature in closed containers under normal storage and handling conditions. It tarnishes on exposure to air. Hazardous polymerization cannot occur.
Chemical Incompatibilities: Mixtures of hydrogen peroxide + trioxane explode on contact with lead. Lead is incompatible with sodium azide, zirconium, disodium acetylide, and oxidants. A violent reaction on ignition may occur with concentrated hydrogen peroxide, chlorine trifluoride, sodium acetylide (with powdered lead), ammonium nitrate (below 200 °C with powdered lead). Lead is attacked by pure water and weak organic acids in the presence of oxygen. Lead is resistant to tap water, hydrofluoric acid, brine, and solvents.
Conditions to Avoid: Rubber gloves containing lead may ignite in nitric acid.
Hazardous Products of Decomposition: Thermal oxidative decomposition of lead can produce highly toxic fumes of lead.

Section 6. Health Hazard Data

Carcinogenicity: Although the NTP and OSHA do not list lead as a carcinogen, the IARC lists it as probably carcinogenic to humans, but having (usually) no human evidence. However, the literature reports instances of lead-induced neoplasms, both benign and malignant, of the kidney and other organs in laboratory rodents. Excessive exposure to lead has resulted in neurologic disorders in infants. Experimental studies show lead has reproductive and teratogenic effects in laboratory animals. Human male and female reproductive effects are also documented.
Summary of Risks: Lead is a potent, systemic poison that affect a variety of organ systems, including the nervous system, kidneys, reproductive system, blood formation, and gastrointestinal (GI) system. The most important way lead enters the body is through inhalation, but it can also be ingested when lead dust or unwashed hands contaminate food, drink, or cigarettes. Much of ingested lead passes through feces without absorption into the body. Adults may absorb only 5 to 15% of ingested lead; children may absorb a much larger fraction. Once in the body, lead enters the bloodstream and circulates to various organs. Lead concentrates and remains in bone for many years. The amount of lead the body stores increases as exposure continues, with possibly cumulative effects. Depending on the dose entering the body, lead can be deadly within several days or affect health after many years. Very high doses can cause brain damage (encephalopathy).
Medical Conditions Aggravated by Exposure: Lead may aggravate nervous system disorders (e.g., epilepsy, neuropathies), kidney diseases, high blood pressure (hypertension), infertility, and anemia. Lead-induced anemia and its effect on blood presssure can aggravate cardiovascular disease.

Continue on next page

Copyright © 1990 Genium Publishing Corporation.
Any commercial use or reproduction without the publisher's permission is prohibited.

Section 6. Health Hazard Data, *continued*

Target Organs: Blood, central and peripheral nervous systems, kidneys, and gastrointestinal (GI) tract.
Primary Entry Routes: Inhalation, ingestion.
Acute Effects: An acute, short-term dose of lead could cause acute encephalopathy with seizures, coma, and death. However, short-term exposures of this magnitude are rare. Reversible kidney damage can occur from acute exposure, as well as anemia.
Chronic Effects: Symptoms of chronic long-term overexposure include appetite loss, nausea, metallic taste in the mouth, lead line on gingival (gum) tissue, constipation, anxiety, anemia, pallor of the face and the eye grounds, excessive tiredness, weakness, insomnia, headache, nervous irritability, fine tremors, numbness, muscle and joint pain, and colic accompanied by severe abdominal pain. Paralysis of wrist and, less often, ankle extensor muscles may occur after years of increased lead absorption. Kidney disease may also result from chronic overexposure, but few, if any, symptoms appear until severe kidney damage has occurred. Reproductive damage is characterized by decreased sex drive, impotence, and sterility in men; and decreased fertility, abnormal menstrual cycles, and miscarriages in women. Unborn children may suffer neurologic damage or developmental problems due to excessive lead exposure in pregnant women. Lead poisoning's severest result is encephalopathy manifested by severe headache, convulsions, coma, delirium, and possibly death.
FIRST AID
Eyes: Gently lift the eyelids and flush immediately and continuously with flooding amounts of water until transported to an emergency medical facility. Consult a physician immediately.
Skin: *Quickly* remove contaminated clothing. Rinse with flooding amounts of water for at least 15 min. Consult a physician if any health complaints develop.
Inhalation: Remove exposed person to fresh air and support breathing as needed. Consult a physician.
Ingestion: Never give anything by mouth to an unconscious or convulsing person. If large amounts of lead were ingested, induce vomiting with Ipecac syrup. Consult a physician immediately.
After first aid, get appropriate in-plant, paramedic, or community medical support.
Physician's Note: For diagnosis, obtain blood pressure, blood lead level (PbB), zinc protoporphyrin (ZPP), complete blood count for microcytic anemia and basophilic stippling, urinalysis, and blood urea nitrogen (BUN) of creatinine. Examine peripheral motor neuropathy, pallor, and gingival lead line. Use Ca-EDTA to treat poison, but *never* chelate prophylactically. Consult an occupational physician or toxicologist.

Section 7. Spill, Leak, and Disposal Procedures

Spill/Leak: Notify safety personnel and evacuate all unnecessary personnel immediately. Cleanup personnel should protect against inhalation of dusts or fume and contact with skin or eyes. Avoid creating dusty conditions. Water sprays may be used in large quantities to prevent the formation of dust. Cleanup methods such as vacuuming (with an appropriate filter) or wet mopping minimizes dust dispersion. Scoop the spilled material into closed containers for disposal or reclamation. Follow applicable OSHA regulations (29 CFR 1910.120).
Disposal: Contact your supplier or a licensed contractor for detailed recommendations. Follow applicable Federal, state, and local regulations.
EPA Designations
Listed as a RCRA Hazardous Waste (40 CFR 261.33, Appendix II—EP Toxicity Test Procedures)
Listed as a CERCLA Hazardous Substance* (40 CFR 302.4), Reportable Quantity (RQ): 1 lb (0.454 kg) [* per Clean Water Act, Sec. 307(a)]
SARA Extremely Hazardous Substance (40 CFR 355): Not listed
Listed as a SARA Toxic Chemical (40 CFR 372.65)
OSHA Designations
Listed as an Air Contaminant (29 CFR 1910.1000, Table Z-1-A)

Section 8. Special Protection Data

Goggles: Wear protective eyeglasses or chemical safety goggles, per OSHA eye- and face-protection regulations (29 CFR 1910.133).
Respirator: Seek professional advice prior to respirator selection and use. Follow OSHA respirator regulations (29 CFR 1910.134) and, if necessary, wear a NIOSH-approved respirator. For emergency or nonroutine operations (cleaning spills, reactor vessels, or storage tanks), wear an SCBA. *Warning! Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.*
Other: Wear impervious gloves, boots, aprons, and gauntlets to prevent skin contact. Protective clothing made of man-made fibers and lacking turn-ups, pleats, or pockets retain less dust from lead.
Ventilation: Provide general and local ventilation systems to maintain airborne concentrations below the OSHA PELs (Sec. 2). Local exhaust ventilation is preferred since it prevents contaminant dispersion into the work area by controlling it at its source.[103]
Safety Stations: Make available in the work area emergency eyewash stations, safety/quick-drench showers, and washing facilities.
Contaminated Equipment: Never wear contact lenses in the work area: soft lenses may absorb, and all lenses concentrate, irritants. Remove this material from your shoes and equipment. Launder contaminated clothing before wearing.
Comments: Never eat, drink, or smoke in work areas. Practice good personal hygiene after using this material, especially washing hands before eating, drinking, smoking, using the toilet, or applying cosmetics.

Section 9. Special Precautions and Comments

Storage Requirements: Store in tightly closed containers in a cool, dry, well-ventilated area away from all incompatible materials, direct sunlight, and heat and ignition sources.
Engineering Controls: Educate worker about lead's hazards. Follow and inform employees of the lead standard (29 CFR 1910.1025). Avoid inhalation of lead dust and fumes and ingestion of lead. Use only with appropriate personal protective gear and adequate ventilation. Institute a respiratory protection program that includes regular training, maintenance, inspection, and evaluation. Avoid creating dusty conditions. Segregate and launder contaminated clothing. Take precautions to protect laundry personnel. Practice good personal hygiene and housekeeping procedures. For a variety of reasons, the lead concentration in workroom air may not correlate with the blood lead levels in individuals.
Other Precautions: Provide preplacement and periodic medical examinations which emphasize blood, nervous system, gastrointestinal tract, and kidneys, including a complete blood count and urinalysis. Receive a complete history including previous surgeries and hospitalization, allergies, smoking history, alcohol consumption, proprietary drug intake, and occupational and nonoccupational lead exposure. Maintain records for medical surveillance, airborne exposure monitoring, employee complaints, and physician's written opinions for at least 40 years or duration of employment plus 20 years. Measurement of blood lead level (PbB) and zinc protoporphyrin (ZPP) are useful indicators of your body's lead absorption level. Maintain worker PbBs at or below 40 µg/100 g of whole blood. To minimize adverse reproductive health effects to parents and developing fetus, maintain the PbBs of workers intending to have children below 30 µg/100 g. Elevated PbBs increase your risk of disease, and the longer you have elevated PbBs, the greater your chance of substantial permanent damage.

Transportation Data (49 CFR 172.102)
IMO Shipping Name: Lead compounds, soluble, n.o.s.
IMO Hazard Class: 6.1
ID No.: UN2291
IMO Label: St. Andrews Cross (X, Stow away from foodstuffs)
IMDG Packaging Group: III

MSDS Collection **References:** 26, 38, 73, 84, 85, 88, 89, 90, 100, 101, 103, 109, 124, 126, 132, 133, 134, 136, 138, 139, 142, 143
Prepared by: MJ Allison, BS; **Industrial Hygiene Review:** DJ Wilson, CIH; **Medical Review:** MJ Upfal, MD, MPH; **Edited by:** JR Stuart, MS

Copyright © 1990 by Genium Publishing Corporation. Any commercial use or reproduction without the publisher's permission is prohibited. Judgments as to the suitability of information herein for the purchaser's purposes are necessarily the purchaser's responsibility. Although reasonable care has been taken in the preparation of such information, Genium Publishing Corporation extends no warranties, makes no representations, and assumes no responsibility as to the accuracy or suitability of such information for application to the purchaser's intended purpose or for consequences of its use.

Genium Publishing Corporation
1145 Catalyn Street
Schenectady, NY 12303-1836 USA
(518) 377-8854

Material Safety Data Sheets Collection:

Sheet No. 469
Fuel Oil No. 2

Issued: 10/81 Revision: A, 11/90

Section 1. Material Identification

33

Fuel Oil No. 2 Description: A mixture of petroleum hydrocarbons; a distillate of low sulfur content. Fuel oil no. 2 resembles kerosine. Used as a general-purpose domestic or commercial fuel in atomizing-type burners; as a fuel for trucks, ships and other automotive engines; as mosquito control (coating on breeding waters); and for drilling muds.
Other Designations: CAS No. 68476-30-2, diesel oil.
Manufacturer: Contact your supplier or distributor. Consult the latest *Chemicalweek Buyers' Guide*(73) for a suppliers list.

R	1
I	-
S	2
K	2

NFPA



HMIS
H 0
F 2
R 0
PPG*
* Sec. 8

Cautions: Fuel oil No. 2 is a skin irritant and central nervous system depressant with high mist concentrations. It is an environmental hazard and a dangerous fire hazard when exposed to heat, flame, or oxidizers.

Section 2. Ingredients and Occupational Exposure Limits

Fuel oil No. 2*

1989 OSHA PEL	1990-91 ACGIH TLV	1988 NIOSH REL	1985-86 Toxicity Data†
None established	None established	None established	Rat, oral, LD_{50}: 9 g/kg; produces gastrointestinal effects (hypermotility, diarrhea)

* A complex mixture (<95%) of paraffinic, olefinic, naphthenic, and aromatic hydrocarbons; sulfur content (<0.5%); and benzene (<100 ppm). [A low benzene level reduces carcinogenic risk. Fuel oils can be exempted under the benzene standard (29 CFR 1910.1028)].
† Monitor NIOSH, *RTECS* (HZ1800000), for future toxicity data.

Section 3. Physical Data

Boiling Point Range: 363 to 634 °F (184 to 334 °C)
Viscosity: 268 centistoke at 100 °F (37.8 °C)
Specific Gravity: 0.8654 at 59 °F (15 °C)
Appearance and Odor: Brown, slightly viscous liquid.
Water Solubility: Insoluble
Pour Point:* <21 °F (-6 °C)

*Pour point is the lowest temperature at which a liquid flows from an inverted test container.

Section 4. Fire and Explosion Data

Flash Point: 100 °F (38 °C) min.	Autoignition Temperature: 494 °F (257 °C)	LEL: 0.6% v/v	UEL: 7.5% v/v

Extinguishing Media: Use dry chemical, carbon dioxide, foam, water fog or spray. Do not use a forced water spray directly on burning oil since this scatters the fire. Use a smothering technique to extinguish fire.
Unusual Fire or Explosion Hazards: Vapors may travel to an ignition source and flash back. This fuel oil's volatility is similar to gasoline's.
Special Fire-fighting Procedures: Isolate hazard area and deny entry. Since fire may produce toxic fumes, wear a self-contained breathing apparatus (SCBA) with a full facepiece operated in pressure-demand or positive-pressure mode and full protective clothing. If feasible, remove containers from fire. Be aware of runoff from fire control methods. Do not release to sewers or waterways due to health and fire or explosion hazard.

Section 5. Reactivity Data

Stability/Polymerization: Fuel oil no. 2 is stable at room temperature in closed containers under normal storage and handling conditions. Hazardous polymerization cannot occur.
Chemical Incompatibilities: Incompatible with strong oxidizing agents; heating greatly increases fire hazard.
Conditions to Avoid: Avoid heat and ignition sources.
Hazardous Products of Decomposition: Thermal oxidative decomposition of fuel oil no. 2 yields various hydrocarbons and hydrocarbon derivatives and partial oxidation products including carbon dioxide, carbon monoxide, and sulfur dioxide.

Copyright © 1990 Genium Publishing Corporation.
Any commercial use or reproduction without the publisher's permission is prohibited.

Section 6. Health Hazard Data

Carcinogenicity: Although it has not assigned an overall evaluation to fuel oil No. 2, the IARC has evaluated distillate (light) fuel oils as not classifiable as human carcinogen (Group 3; animal evidence limited).
Summary of Risks: Excessive inhalation of aersol or mist can cause respiratory tract irritation, headache, dizziness, nausea, stupor, convulsions, or unconsciousness, depending on concentration and time of exposure. Since intestinal absorption of longer chain hydrocarbons is lower than absorption from lighter fuels, a lesser degree of systemic effects and more diarrhea may result. When removed from exposed area, affected persons usually experience complete recovery. Hemorrhaging and pulmonary edema, progressing to renal involvement and chemical pneumonitis, may result if oil is aspirated into the lungs. These results are more likely when vomiting after ingestion rather than upon ingestion, as is often the case with lower viscosity fuels. A comparative ratio of oral-to-aspirated lethal doses may be 1 pt vs. 5 ml. Prolonged or repeated skin contact may cause irritation of the hair follicles and may block the sebaceous glands, producing a rash of acne pimples and spots, usually on arms and legs.
Medical Conditions Aggravated by Long-Term Exposure: None reported.
Target Organs: Central nervous system (CNS), skin, and mucous membranes.
Primary Entry Routes: Inhalation, ingestion.
Acute Effects: Systemic effects from ingestion include gastrointestinal (GI) irritation, vomiting, diarrhea, and, in severe cases, CNS depression, progressing to coma and death. Inhalation of aerosol or mists may result in increased rate of respiration, tachycardia (excessively rapid heart beat), and cyanosis (dark purplish coloration of the skin and mucous membranes caused by deficient blood oxygenation).
Chronic Effects: Repeated contact with the skin causes dermatitis.
FIRST AID
Eyes: Gently lift the eyelids and flush immediately and continuously with flooding amounts of water until transported to an emergency medical facility. Consult a physician immediately.
Skin: *Quickly* remove contaminated clothing. Rinse with flooding amounts of water for at least 15 min. If large areas of the body are exposed or if irritation persists, get medical help immediately. Wash affected area with soap and water.
Inhalation: Remove exposed person to fresh air and support breathing as needed.
Ingestion: Never give anything by mouth to an unconscious or convulsing person. If ingested, *do not induce vomiting* due to aspiration hazard. Contact a physician immediately.
After first aid, get appropriate in-plant, paramedic, or community medical support.
Note to Physicians: Gastric lavage is contraindicated due to aspiration hazard. Preferred antidotes are charcoal and milk. In cases of severe aspiration pneumonitis, consider monitoring arterial blood gases to ensure adequate ventilation. Observe the patient for 6 hr. If vital signs become abnormal or symptoms develop, obtain a chest x-ray.

Section 7. Spill, Leak, and Disposal Procedures

Spill/Leak: Notify safety personnel, evacuate area for large spills, remove all heat and ignition sources, and provide maximum explosion-proof ventilation. Cleanup personnel should protect against vapor inhalation and liquid contact. Clean up spills promptly to reduce fire or vapor hazards. Use noncombustible absorbent material to pick up small spills or residues. For large spills, dike far ahead to contain. Pick up liquid for reclamation or disposal. Do not release to sewers or waterways due to health and fire and/or explosion hazard. Follow applicable OSHA regulations (29 CFR 1910.120). Fuel oil no. 2 is an environmental hazard. Report large spills.
Disposal: Contact your supplier or a licensed contractor for detailed recommendations. Follow applicable Federal, state, and local regulations.
EPA Designations
Listed as a RCRA Hazardous Waste (40 CFR 261.21): Ignitable waste
CERCLA Hazardous Substance (40 CFR 302.4): Not listed
SARA Extremely Hazardous Substance (40 CFR 355): Not listed
SARA Toxic Chemical (40 CFR 372.65): Not listed
OSHA Designations
Air Contaminant (29 CFR 1910.1000, Subpart Z): Not listed

Section 8. Special Protection Data

Goggles: Wear protective eyeglasses or chemical safety goggles, per OSHA eye- and face-protection regulations (29 CFR 1910.133).
Respirator: Seek professional advice prior to respirator selection and use. Follow OSHA respirator regulations (29 CFR 1910.134) and, if necessary, use a NIOSH-approved respirator with mist filter and organic vapor cartridge. For emergency or nonroutine operations (cleaning spills, reactor vessels, or storage tanks), wear an SCBA. *Warning! Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.*
Other: Wear impervious gloves, boots, aprons, and gauntlets to prevent skin contact.
Ventilation: Provide general and local explosion-proof ventilation systems to maintain airborne concentrations that promote worker safety and productivity. Local exhaust ventilation is preferred since it prevents contaminant dispersion into the work area by controlling it at its source.[103]
Safety Stations: Make available in the work area emergency eyewash stations, safety/quick-drench showers, and washing facilities.
Contaminated Equipment: Never wear contact lenses in the work area: soft lenses may absorb, and all lenses concentrate, irritants. Remove this material from your shoes and equipment. Launder contaminated clothing before wearing.
Comments: Never eat, drink, or smoke in work areas. Practice good personal hygiene after using this material, especially before eating, drinking, smoking, using the toilet, or applying cosmetics.

Section 9. Special Precautions and Comments

Storage Requirements: Use and storage conditions should be suitable for an OSHA Class II combustible liquid. Store in closed containers in a well-ventilated area away from heat and ignition sources and strong oxidizing agents. Protect containers from physical damage. To prevent static sparks, electrically ground and bond all containers and equipment used in shipping, receiving, or transferring operations. Use nonsparking tools and explosion-proof electrical equipment. No smoking in areas of storage or use.
Engineering Controls: Avoid prolonged skin contact and vapor or mist inhalation. Use only in a well-ventilated area with personal protective gear. Institute a respiratory protection program that includes regular training, maintenance, inspection, and evaluation. Practice good personal hygiene and housekeeping procedures. Do not wear oil contaminated clothing. Do not put oily rags in pockets. When working with this material, wear gloves or use barrier cream.

Transportation Data (49 CFR 172.101)
DOT Shipping Name: Fuel oil
DOT Hazard Class: Combustible liquid
ID No.: NA1993
DOT Label: None
DOT Packaging Exceptions: 173.118a
DOT Packaging Requirements: None

MSDS Collection References: 1, 6, 7, 12, 73, 84, 103, 126, 127, 132, 133, 136, 143
Prepared by: MJ Allison, BS; Industrial Hygiene Review: DJ Wilson, CIH; Medical Review: W Silverman, MD; Edited by: JR Stuart, MS

Copyright © 1990 by Genium Publishing Corporation. Any commercial use or reproduction without the publisher's permission is prohibited. Judgments as to the suitability of information herein for the purchaser's purposes are necessarily the purchaser's responsibility. Although reasonable care has been taken in the preparation of such information, Genium Publishing Corporation extends no warranties, makes no representations, and assumes no responsibility as to the accuracy or suitability of such information for application to the purchaser's intended purpose or for consequences of its use.

Genium Publishing Corporation
1145 Catalyn Street
Schenectady, NY 12303-1836 USA
(518) 377-8854

Material Safety Data Sheets Collection:

Sheet No. 316
Benzene

Issued: 11/78 Revision: E, 8/90

Section 1. Material Identification

Benzene (C_6H_6) Description: Derived by fractional distillation of coal tar, hydrodealkylation of toluene or pyrolysis of gasoline, catalytic reforming of petroleum, and transalkylation of toluene by disproportionation reaction. Used as a fuel; a chemical reagent; a solvent for a large number of materials such as paints, plastics, rubber, inks, oils, and fats; in manufacturing phenol, ethylbenzene (for styrene monomer), nitrobenzene (for aniline), dodecylbenzene (for detergents), cyclohexane (for nylon), chlorobenzene, diphenyl, benzene hexachloride, maleic anhydride, benzene-sulfonic acid, artificial leather, linoleum, oil cloth, varnishes, and lacquers; for printing and lithography; in dry cleaning; in adhesives and coatings; for extraction and rectification; as a degreasing agent; in the tire industry; and in shoe factories. Benzene has been banned as an ingredient in products intended for household use and is no longer used in pesticides.

Other Designations: CAS No. 0071-43-2, benzol, carbon oil, coal naphtha, cyclohexatriene, mineral naphtha, nitration benzene, phene, phenyl hydride, pyrobenzol.

Manufacturer: Contact your supplier or distributor. Consult the latest *Chemicalweek Buyers' Guide*(73) for a suppliers list.

R	I
I	4
S	2*
K	4

*Skin absorption

NFPA



HMIS
H 3
F 3
R 0
PPG†
† Sec.

Cautions: Benzene is a confirmed *human carcinogen* by the IARC. *Chronic low-level exposure may cause cancer (leukemia) and bone marrow damage, with injury to blood-forming tissue.* It is also a dangerous fire hazard when exposed to heat or flame.

Section 2. Ingredients and Occupational Exposure Limits

Benzene, ca 100%*

1989 OSHA PELs
(29 CFR 1910.1000, Table Z-1-A)
8-hr TWA: 1 ppm, 3 mg/m³
15-min STEL: 5 ppm, 15 mg/m³

(29 CFR 1910.1000, Table Z-2)
8-hr TWA: 10 ppm
Acceptable Ceiling Concentration: 25 ppm
Acceptable Maximum Peak: 50 ppm (10 min)†

1989-90 ACGIH
TLV-TWA: 10 ppm, 32 mg/m³

1988 NIOSH RELs
TWA: 0.1 ppm, 0.3 mg/m³
Ceiling: 1 ppm, 3 mg/m³

1985-86 Toxicity Data‡
Man, oral, LD_{Lo}: 50 mg/kg; no toxic effect noted
Man, inhalation, TC_{Lo}: 150 ppm inhaled intermittently over 1 yr in a number of discrete, separate doses affects the blood (other changes) and nutritional and gross metabolism (body temperature increase)
Rabbit, eye: 2 mg administered over 24 hr produces severe irritation

* OSHA 29 CFR 1910.1000, Subpart Z, states that the final benzene standard in 29 CFR 1910.1028 applies to all occupational exposures to benzene except in som subsegments of industry where exposures are consistently under the action level (i.e., distribution and sale of fuels, sealed containers and pipelines, coke productio oil and gas drilling and production, natural gas processing, and the percentage exclusion for liquid mixtures); for the excepted subsegments, the benzene limits in Table Z-2 apply.
† Acceptable maximum peak above the acceptable ceiling concentration for an 8-hr shift.
‡ See NIOSH, *RTECS* (CY1400000), for additional irritative, mutative, reproductive, tumorigenic, and toxicity data.

Section 3. Physical Data

Boiling Point: 176 °F (80 °C)
Melting Point: 42 °F (5.5 °C)
Vapor Pressure: 100 mm Hg at 79 °F (26.1 °C)
Vapor Density (Air = 1): 2.7
Evaporation Rate (Ether = 1): 2.8
Molecular Weight: 78.11
Specific Gravity (15 °C/4 °C): 0.8787
Water Solubility: Slightly (0.180 g/100 g of H_2O at 25 °C)
% Volatile by Volume: 100
Viscosity: 0.6468 mPa at 20 °C

Appearance and Odor: A colorless liquid with a characteristic sweet, aromatic odor. The odor recognition threshold (100% of panel) is approximately 5 ppm (unfatigued) in air. Odor *is not* an adequate warning of hazard.

Section 4. Fire and Explosion Data

Flash Point: 12 °F (-11.1 °C), CC	Autoignition Temperature: 928 °F (498 °C)	LEL: 1.3% v/v	UEL: 7.1% v/v

Extinguishing Media: Use dry chemical, foam, or carbon dioxide to extinguish benzene fires. Water may be ineffective as an extinguishing agent since it can scatter and spread the fire. Use water spray to cool fire-exposed containers, flush spills away from exposures, disperse benzene vapor, and protect personnel attempting to stop an unignited benzene leak.

Unusual Fire or Explosion Hazards: Benzene is a Class 1B flammable liquid. A concentration exceeding 3250 ppm is considered a potential fire explosion hazard. Benzene vapor is heavier than air and can collect in low lying areas or travel to an ignition source and flash back. Explosiv and flammable benzene vapor-air mixtures can easily form at room temperature. Eliminate all ignition sources where benzene is used, handled, o stored.

Special Fire-fighting Procedures: Isolate hazard area and deny entry. Since fire may produce toxic fumes, wear a self-contained breathing apparatus (SCBA) with a full facepiece operated in the pressure-demand or positive-pressure mode and full protective equipment. Structural firefighter's protective clothing provides limited protection. Stay out of low areas. Be aware of runoff from fire control methods. Do not release t sewers or waterways. Runoff to sewer can create pollution, fire, and explosion hazard.

Section 5. Reactivity Data

Stability/Polymerization: Benzene is stable at room temperature in closed containers under normal storage and handling conditions. Hazardous polymerization cannot occur.

Chemical Incompatibilities: Benzene explodes on contact with diborane, permanganic acid, bromine pentafluoride, peroxodisulfuric acid, and peroxomonosulfuric acid. It ignites on contact with dioxygen difluoride, dioxygenyl tetrafluoroborate, iodine heptafluoride, and sodium peroxide + water. Benzene forms sensitive, explosive mixture with iodine pentafluoride, ozone, liquid oxygen, silver perchlorate, nitryl perchlorate, nitric acid, and arsenic pentafluoride + potassium methoxide (explodes above 30 °C). A vigorous or incandescent reaction occurs with bromine trifluoride, uranium hexafluoride, and hydrogen + Raney nickel [above 410 °F (210 °C)]. Benzene is incompatible with oxidizing materials.

Conditions to Avoid: Avoid heat and ignition sources.

Hazardous Products of Decomposition: Thermal oxidative decomposition of benzene can produce toxic gases and vapors such as carbon monoxide.

Copyright © 1990 Genium Publishing Corporation.
Any commercial use or reproduction without the publisher's permission is prohibited.

Section 6. Health Hazard Data

Carcinogenicity: The ACGIH, OSHA, and IARC list benzene as, respectively, a supected human carcinogen, a cancer hazard, and, based on sufficient human and animal evidence, a human carcinogen (Group 1).
Summary of Risks: Prolonged skin contact or excessive inhalation of benzene vapor may cause headache, weakness, appetite loss, and fatigue. The most important health hazards are cancer (leukemia) and bone marrow damage with injury to blood-forming tissue from chronic low-level exposure. Higher level exposures may irritate the respiratory tract and cause central nervous system (CNS) depression.
Medical Conditions Aggravated by Long-Term Exposure: Exposure may worsen ailments of the heart, lungs, liver, kidneys, blood, and CNS.
Target Organs: Blood, central nervous system, bone marrow, eyes, upper respiratory tract, and skin.
Primary Entry Routes: Inhalation, skin contact.
Acute Effects: Symptoms of acute overexposure include irritation of the eyes, nose, and respiratory tract, breathlessness, euphoria, nausea, drowsiness, headache, dizziness, and intoxication. Severe exposure may lead to convulsions and unconsciousness. Skin contact may cause a drying rash (dermatitis).
Chronic Effects: Long-term chronic exposure may result in many blood disorders ranging from aplastic anemia (an inability to form blood cells) to leukemia.
FIRST AID
Eyes: Gently lift the eyelids and flush immediately and continuously with flooding amounts of water until transported to an emergency medical facility. Consult a physician immediately.
Skin: *Quickly* remove contaminated clothing. Immediately rinse with flooding amounts of water for at least 15 min. For reddened or blistered skin, consult a physician. Wash affected area with soap and water.
Inhalation: Remove exposed person to fresh air. Emergency personnel should protect against inhalation exposure. Provide CPR to support breathing or circulation as necessary. Keep awake and transport to a medical facility.
Ingestion: Never give anything by mouth to an unconscious or convulsing person. If ingested, *do not induce vomiting* since aspiration may be fatal. Call a physician immediately.
After first aid, get appropriate in-plant, paramedic, or community medical support.
Physician's Note: Evaluate chronic exposure with a CBC, peripheral smear, and reticulocyte count for signs of myelotoxicity. Follow up any early indicators of leukemia with a bone marrow biopsy. Urinary phenol conjugates may be used for biological monitoring of recent exposure. Acute management is primarily supportive for CNS depression.

Section 7. Spill, Leak, and Disposal Procedures

Spill/Leak: *Design and practice a benzene spill control and countermeasure plan (SCCP).* Notify safety personnel, evacuate all unnecessary personnel, eliminate all heat and ignition sources, and provide adequate ventilation. Cleanup personnel should protect against vapor inhalation, eye contact, and skin absorption. Absorb as much benzene as possible with an inert, noncombustible material. For large spills, dike far ahead of spill and contain liquid. Use nonsparking tools to place waste liquid or absorbent into closable containers for disposal. Keep waste out of confined spaces such as sewers, watersheds, and waterways because of explosion danger. Follow applicable OSHA regulations (29 CFR 1910.120).
Disposal: Contact your supplier or a licensed contractor for detailed recommendations. Follow applicable Federal, state, and local regulations.
EPA Designations
Listed as a RCRA Hazardous Waste (40 CFR 261.33), Hazardous Waste No. U019
Listed as a CERCLA Hazardous Substance* (40 CFR 302.4), Reportable Quantity (RQ): 1000 lb (454 kg) [* per Clean Water Act, Sec. 307 (a), 311 (b)(4), 112; and per RCRA, Sec. 3001]
SARA Extremely Hazardous Substance (40 CFR 355): Not listed
Listed as SARA Toxic Chemical (40 CFR 372.65)
OSHA Designations
Listed as an Air Contaminant (29 CFR 1910.1000, Tables Z-1-A and Z-2)

Section 8. Special Protection Data

Goggles: Wear protective eyeglasses or chemical safety goggles, per OSHA eye- and face-protection regulations (29 CFR 1910.133).
Respirator: Seek professional advice prior to respirator selection and use. Follow OSHA respirator regulations (29 CFR 1910.134) and, if necessary, wear a NIOSH-approved respirator. For emergency or nonroutine operations (cleaning spills, reactor vessels, or storage tanks), wear an SCBA. *Warning! Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.*
Other: Wear impervious gloves, boots, aprons, and gauntlets to prevent skin contact.
Ventilation: Provide general and local explosion-proof ventilation systems to maintain airborne concentrations at least below the OSHA PELs (Sec. 2). Local exhaust ventilation is preferred since it prevents contaminant dispersion into the work area by controlling it at its source.[103]
Safety Stations: Make available in the work area emergency eyewash stations, safety/quick-drench showers, and washing facilities.
Contaminated Equipment: Never wear contact lenses in the work area: soft lenses may absorb, and all lenses concentrate, irritants. Remove this material from your shoes and equipment. Launder contaminated clothing before wearing.
Comments: Never eat, drink, or smoke in work areas. Practice good personal hygiene after using this material, especially before eating, drinking, smoking, using the toilet, or applying cosmetics.

Section 9. Special Precautions and Comments

Storage Requirements: Store in tightly closed containers in a cool, dry, well-ventilated area away from all heat and ignition sources and incompatible materials. *Caution! Benzene vapor may form explosive mixtures in air.* To prevent static sparks, electrically ground and bond all containers and equipment used in shipping, receiving, or transferring operations in production and storage areas. When opening or closing benzene containers, use nonsparking tools. Keep fire extinguishers readily available.
Engineering Controls: Because OSHA specifically regulates benzene (29 CFR 1910.1028), educate workers about its potential hazards and dangers. Minimize all possible exposures to carcinogens. If possible, substitute less toxic solvents for benzene; use this material with extreme caution and only if absolutely essential. Avoid vapor inhalation and skin and eye contact. Use only with adequate ventilation and appropriate personal protective gear. Institute a respiratory protection program that includes regular training, maintenance, inspection, and evaluation. Designate regulated areas of benzene use (see legend in the box below) and label benzene containers with "DANGER, CONTAINS BENZENE, CANCER HAZARD."
Other Precautions: Provide preplacement and periodic medical examinations with emphasis on a history of blood disease or previous exposure.

Transportation Data (49 CFR 172.101, .102)

DOT Shipping Name: Benzene (*benzol*)
DOT Hazard Class: Flammable liquid
ID No.: UN1114
DOT Label: Flammable liquid
DOT Packaging Exceptions: 173.118
DOT Packaging Requirements: 173.119

IMO Shipping Name: Benzene
IMO Hazard Class: 3.2
ID No.: UN1114
IMO Label: Flammable liquid
IMDG Packaging Group: II

DANGER
BENZENE
CANCER HAZARD
FLAMMABLE–NO SMOKING
AUTHORIZED PERSONNEL ONLY
RESPIRATOR REQUIRED

MSDS Collection References: 1, 2, 12, 26, 73, 84-94, 100, 101, 103, 109, 124, 126, 127, 132, 134, 136, 138, 139, 143
Prepared by: MJ Allison, BS; Industrial Hygiene Review: DJ Wilson, CIH; Medical Review: MJ Upfal, MD, MPH; Edited by: JR Stuart, MS

Copyright © 1990 by Genium Publishing Corporation. Any commercial use or reproduction without the publisher's permission is prohibited. Judgments as to the suitability of information herein for the purchaser's purposes are necessarily the purchaser's responsibility. Although reasonable care has been taken in the preparation of such information, Genium Publishing Corporation extends no warranties, makes no representations, and assumes no responsibility as to the accuracy or suitability of such information for application to the purchaser's intended purpose or for consequences of its use.

Material Safety Data Sheet

Genium Publishing Corporation
1145 Catalyn Street
Schenectady, NY 12303-1836 USA
(518) 377-8855

GENIUM PUBLISHING CORP.

No. 317
TOLUENE
(Revision D)

Issued: August 1979
Revised: April 1986

SECTION 1. MATERIAL IDENTIFICATION

MATERIAL NAME: TOLUENE

OTHER DESIGNATIONS: Methyl Benzene, Methyl Benzol, Phenylmethane, Toluol, C_7H_8, CAS #0108-88-3

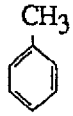
MANUFACTURER/SUPPLIER: Available from many suppliers, including:
Allied Corp., PO Box 2064R, Morristown, NJ 07960; Telephone: (201) 455-4400
Ashland Chemical Co., Industrial Chemicals & Solvents Div., PO Box 2219, Columbus, OH; Telephone: (614) 889-3844

HMIS
H: 2
F: 3
R: 0
PPE*
*See sect. 8



R 1
I 3
S 2
K 4

SECTION 2. INGREDIENTS AND HAZARDS

	%	HAZARD DATA
Toluene 	ca 100	8-hr TLV: 100 ppm, or 375 mg/m^3* (Skin)** --- Man, Inhalation, TCLo: 100 ppm: Psychotropic*** --- Rat, Oral, LD_{50}: 5000 mg/kg Rat, Inhalation, LCLo: 4000 ppm/4 hrs. Rabbit, Skin, LD_{50}: 14 gm/kg --- Human, Eye: 300 ppm

* Current (1985-86) ACGIH TLV. The OSHA PEL is 200 ppm with an acceptable ceiling concentration of 300 ppm and an acceptable maximum peak of 500 ppm/10 minutes.

** Skin designation indicates that toluene can be absorbed through intact skin and contribute to overall exposure.

*** Affects the mind.

SECTION 3. PHYSICAL DATA

Boiling Point ... 231°F (111°C)
Vapor Pressure @ 20°C, mm Hg ... 22
Water Solubility @ 20°C, wt. % ... 0.05
Vapor Density (Air = 1) ... 3.14
Evaporation Rate (BuAc = 1) ... 2.24
Specific Gravity (H_2O = 1) ... 0.866
Melting Point ... -139°F (-95°C)
Percent Volatile by Volume ... ca 100
Molecular Weight ... 92.15

Appearance and odor: Clear, colorless liquid with a characteristic aromatic odor. The odor is detectable to most individuals in the range of 10 to 15 ppm. Because olfactory fatigue occurs rapidly upon exposure to toluene, odor is not a good warning property.

SECTION 4. FIRE AND EXPLOSION DATA

Flash Point and Method	Autoignition Temp.	Flammability Limits In Air	LOWER	UPPER
40°F (4°C) CC	896°F (480°C)	% by Volume	1.27	7.1

EXTINGUISHING MEDIA: Carbon dioxide, dry chemical, alcohol foam. Do not use a solid stream of water because the stream will scatter and spread the fire. Use water spray to cool tanks/containers that are exposed to fire and to disperse vapors.

UNUSUAL FIRE/EXPLOSION HAZARDS: This OSHA class IB flammable liquid is a dangerous fire hazard. It is a moderate fire hazard when exposed to oxidizers, heat, sparks, or open flame. Vapors are heavier than air and may travel a considerable distance to an ignition source and flash back.

SPECIAL FIRE-FIGHTING PROCEDURES: Fire fighters should wear self-contained breathing apparatus with full facepiece operated in a positive-pressure mode when fighting fires involving toluene.

SECTION 5. REACTIVITY DATA

CHEMICAL INCOMPATIBILITIES: Toluene is stable in closed containers at room temperature under normal storage and handling conditions. It does not undergo hazardous polymerization. This material is incompatible with strong oxidizing agents, dinitrogen tetraoxide, silver perchlorate, tetranitromethane, and uranium hexafluoride. Contact with these materials may cause fire or explosion. Nitric acid and toluene, especially in the presence of sulfuric acid, will produce nitrated compounds that are dangerously explosive.

CONDITIONS TO AVOID: Avoid exposure to sparks, open flame, hot surfaces, and all sources of heat and ignition. Toluene will attack some forms of plastics, rubber, and coatings. Thermal decomposition or burning produces carbon dioxide and/or carbon monoxide.

Copyright © 1986 Genium Publishing Corporation.
Any commercial use or reproduction without the publisher's permission is prohibited.

SECTION 6. HEALTH HAZARD INFORMATION | TLV

Toluene is not considered a carcinogen by the NTP, IARC, or OSHA. SUMMARY OF RISKS: Vapors of toluene may cause irritation of the eyes, nose, upper respiratory tract, and skin. Exposure to 200 ppm for 8 hours causes mild fatigue, weakness, confusion, lacrimation (tearing) and paresthesia (a sensation of prickling, tingling, or creeping on the skin that has no objective cause). Exposure to higher concentrations may cause headache, nausea, dizziness, dilated pupils, and euphoria, and, in severe cases, may cause unconsciousness and death. The liquid is irritating to the eyes and skin. Contact with the eyes may cause transient corneal damage, conjunctival irritation, and burns if not promptly removed. Repeated and/or prolonged contact with the skin may cause drying and cracking. It may be absorbed through the skin in toxic amounts. Ingestion causes irritation of the gastrointestinal tract and may cause effects resembling those from inhalation of the vapor. Chronic overexposure to toluene may cause reversible kidney and liver injury. FIRST AID: EYE CONTACT: Immediately flush eyes, including under eyelids, with running water for at least 15 minutes. Get medical attention if irritation persists.* SKIN CONTACT: Immediately flush skin (for at least 15 minutes) while removing contaminated shoes and clothing. Wash exposed area with soap and water. Get medical attention if irritation persists or if a large area has been exposed.* INHALATION: Remove victim to fresh air. Restore and/or support breathing as required. Keep victim warm and quiet. Get medical help.* INGESTION: Give victim 1 to 2 glasses of water or milk. Contact a poison control center. Do not induce vomiting unless directed to do so. Transport victim to a medical facility. Never give anything by mouth to a person who is unconscious or convulsing. * GET MEDICAL ASSISTANCE = In plant, paramedic, community. Get medical help for further treatment, observation, and support after first aid, if indicated.

SECTION 7. SPILL, LEAK, AND DISPOSAL PROCEDURES

SPILL/LEAK: Notify safety personnel of large spills or leaks. Remove all sources of heat and ignition. Provide maximum explosion-proof ventilation. Limit access to spill area to necessary personnel only. Remove leaking containers to safe place if feasible. Cleanup personnel need protection against contact with liquid and inhalation of vapor (see sect. 8). WASTE DISPOSAL: Absorb small spills with paper towel or vermiculite. Contain large spills and collect if feasible, or absorb with vermiculite or sand. Place waste solvent or absorbent into closed containers for disposal using nonsparking tools. Liquid can be flushed with water to an open holding area for handling. Do not flush to sewer, watershed, or waterway. COMMENTS: Place in suitable container for disposal by a licensed contractor or burn in an approved incinerator. Consider reclaiming by distillation. Contaminated absorbent can be buried in a sanitary landfill. Follow all Federal, state, and local regulations. TLm 96: 100-10 ppm. Toluene is designated as a hazardous waste by the EPA. The EPA (RCRA) HW No. is U220 (40 CFR 261). The reportable quantity (RQ) is 1000 lbs/454 kg (40 CFR 117).

SECTION 8. SPECIAL PROTECTION INFORMATION

Provide general and local exhaust ventilation to meet TLV requirements. Ventilation fans and other electrical service must be nonsparking and have an explosion-proof design. Exhaust hoods should have a face velocity of at least 100 lfm (linear feet per minute) and be designed to capture heavy vapor. For emergency or nonroutine exposures where the TLV may be exceeded, use an organic chemical cartridge respirator if concentration is less than 200 ppm and an approved canister gas mask or self-contained breathing apparatus with full facepiece if concentration is greater than 200 ppm.

Safety glasses or splash goggles should be worn in all work areas. Neoprene gloves, apron, face shield, boots, and other appropriate protective clothing and equipment should be available and worn as necessary to prevent skin and eye contact. Remove contaminated clothing immediately and do not wear it until it has been properly laundered.

Eyewash stations and safety showers should be readily available in use and handling areas.

Contact lenses pose a special hazard; soft lenses may absorb irritants and all lenses concentrate them.

SECTION 9. SPECIAL PRECAUTIONS AND COMMENTS

STORAGE SEGREGATION: Store in a cool, dry, well-ventilated area away from oxidizing agents, heat, sparks, or open flame. Storage areas must meet OSHA requirements for class IB flammable liquids. Use metal safety cans for handling small amounts. Protect containers from physical damage. Use only with adequate ventilation. Avoid contact with eyes, skin, or clothing. Do not inhale or ingest. Use caution when handling this compound because it can be absorbed through intact skin in toxic amounts. SPECIAL HANDLING/STORAGE: Ground and bond metal containers and equipment to prevent static sparks when making transfers. Do not smoke in use or storage areas. Use nonsparking tools. ENGINEERING CONTROLS: Preplacement and periodic medical exams emphasizing the liver, kidneys, nervous system, lungs, heart, and blood should be provided. Workers exposed to concentrations greater than the action level (50 ppm) should be examined at least once a year. Use of alcohol can aggravate the toxic effects of toluene.

COMMENTS: Emptied containers contain product residues. Handle accordingly!

Toluene is designated as a hazardous substance by the EPA (40 CFR 116). DOT Classification: Flammable liquid. UN1294.

Data Source(s) Code: 1-9, 12, 16, 20, 21, 24, 26, 34, 81, 82. CR

Judgements as to the suitability of information herein for purchaser's purposes are necessarily purchaser's responsibility. Therefore, although reasonable care has been taken in the preparation of such information, Genium Publishing Corp. extends no warranties, makes no representations and assumes no responsibility as to the accuracy or suitability of such information for application to purchaser's intended purposes or for consequences of its use.

Approvals

Indust. Hygiene/Safety

Medical Review

Copyright © 1986 Genium Publishing Corporation. Commercial use or reproduction without the publisher's permission is prohibited.

Copyright © April 1, 1986

Material Safety Data Sheet

from Genium's Reference Collection
Genium Publishing Corporation
1145 Catalyn Street
Schenectady, NY 12303-1836 USA
(518) 377-8855

GENIUM PUBLISHING CORP.

No. 385

ETHYL BENZENE
(Revision A)
Issued: August 1978
Revised: November 1988

SECTION 1. MATERIAL IDENTIFICATION

Material Name: ETHYL BENZENE

Description (Origin/Uses): Used as a solvent and as an intermediate in the production of styrene monomer.

Other Designations: Phenylethane; Ethylbenzol; $C_2H_5C_6H_5$; CAS No. 0100-41-4

Manufacturer: Contact your supplier or distributor. Consult the latest edition of the *Chemicalweek Buyers' Guide* (Genium ref. 73) for a list of suppliers.



NFPA

HMIS	
H 2	R 1
F 3	I 3
R 0	S 2
PPG*	K 4
*See sect. 8	

SECTION 2. INGREDIENTS AND HAZARDS	%	EXPOSURE LIMITS
Ethyl Benzene, CAS No. 0100-41-4	Ca 100	**OSHA PELs** 8-Hr TWA: 100 ppm, 435 mg/m³ 15- Min STEL: 125 ppm, 545 mg/m³ **ACGIH TLVs, 1988-89** TLV-TWA: 100 ppm, 435 mg/m³ TLV-STEL: 125 ppm, 545 mg/m³ **Toxicity Data*** Human, Inhalation, TC_{Lo}: 100 ppm (8 Hrs) Rat, Oral, LD_{50}: 3500 mg/kg
*See NIOSH, *RTECS* (DA0700000), for additional data with references to reproductive, irritative, and mutagenic effects.		

SECTION 3. PHYSICAL DATA

Boiling Point: 277°F (136°C)
Melting Point: -139°F (-95°C)
Vapor Pressure: 7.1 Torrs at 68°F (20°C)
Vapor Density (Air = 1): 3.7
% Volatile by Volume: Ca 100

Molecular Weight: 106 Grams/Mole
Solubility in Water (%): Slight
Specific Gravity (H_2O = 1): 0.86258 at 77°F (25°C)

Appearance and Odor: A clear, colorless, flammable liquid; characteristic aromatic hydrocarbon odor.

SECTION 4. FIRE AND EXPLOSION DATA

Flash Point and Method: 64°F (18°C) CC	Autoignition Temperature: 810°F (432.22°C)	LEL: 1% v/v	UEL: 6.7% v/v

Extinguishing Media: Use foam, dry chemical, or carbon dioxide to put out ethyl benzene fires. A water spray may be ineffective in extinguishing the fire, because it can scatter and spread the burning liquid. Use water spray to cool fire-exposed containers of ethyl benzene, to disperse ethyl benzene vapor, and to protect personnel attempting to stop an ethyl benzene leak. Unusual Fire or Explosion Hazards: This liquid can readily form explosive vapor-air mixtures, especially when heated. Ethyl benzene vapor is heavier than air and may travel a considerable distance to a low-lying source of ignition and flash back to its origin. Special Fire-fighting Procedures: Wear a self-contained breathing apparatus (SCBA) with a full facepiece operated in the pressure-demand or positive-pressure mode.

SECTION 5. REACTIVITY DATA

Stability/Polymerization: Ethyl benzene is stable in closed containers during routine operations. Hazardous polymerization cannot occur. Chemical Incompatibilities: Hazardous chemical reactions can occur between ethyl benzene and strong oxidizing agents, acids, ammonia, and bases. Conditions to Avoid: Avoid any exposure to sources of ignition such as heat, sparks, open flame, and lighted tobacco products, etc., and to incompatible chemicals. Use caution when entering confined spaces, particularly low-lying areas where explosive concentrations of ethyl benzene vapor may be present. Provide good ventilation to such areas to prevent the concentration of this vapor. Hazardous Products of Decomposition: Thermal-oxidative degradation can include toxic gases such as carbon monoxide and/or aromatic hydrocarbon gases.

SECTION 6. HEALTH HAZARD INFORMATION

Carcinogenicity: Ethyl benzene is not listed as a carcinogen by the NTP, IARC, or OSHA.
Summary of Risks: Ethyl benzene vapor is severely irritating to the eyes and to the mucous membranes of the respiratory system. Sustained inhalation of excessive levels can cause depression of the central nervous system (CNS) characterized by dizziness, headache, narcosis, and coma. Skin contact with liquid ethyl benzene causes irritation; dermatitis and defatting can also develop. The acute oral toxicity of ethyl benzene is low; however, ingestion of it presents a serious aspiration hazard. Aspirating even a small amount into the lungs can result in extensive edema (lungs filled with fluid) and hemorrhaging of the lung tissue. No systemic effects are expected at the levels that produce pronounced, unignorable, disagreeable skin and eye irritation. The TLVs cited in section 2 are set to prevent this intolerable irritation. Medical Conditions Aggravated by Long-Term Exposure: None reported. Target Organs: Skin, eyes, respiratory system, and CNS. Primary Entry: Inhalation, skin contact Acute Effects: Irritation of the skin, eyes, and respiratory system. Also, cardiac-rhythm disturbance due to sensitization; acute bronchitis, bronchospasm, pulmonary and laryngeal edema; euphoria; headache; giddiness; dizziness; and incoordination, as well as possible depression; confusion; and coma. Chronic Effects: None reported. First Aid: Eyes. Immediately

Copyright © 1988 by Genium Publishing Corporation

SECTION 6. HEALTH HAZARD INFORMATION, cont.

flush eyes, including under the eyelids, gently but thoroughly with flooding amounts of running water for at least 15 minutes. **Skin.** Rinse the affected area with plenty of water, then wash it with soap and water. **Inhalation.** Remove the exposed person to fresh air; restore and/or support his or her breathing as needed. Have qualified medical personnel administer oxygen as required. **Ingestion.** Unlikely. Should this type of exposure occur, the aspiration hazard must be considered. Do not induce vomiting unless directed to do so by a physician. To prevent aspiration by spontaneous vomiting, keep the victim's head low (between his or her knees). **Get medical help (in plant, paramedic, community) for all exposures.** Seek prompt medical assistance for further treatment, observation, and support after first aid. **Note to Physician:** Professional judgment is required as to whether or not to induce vomiting because of the possibility of aspiration. A gastric lavage may be administered, followed by saline catharsis, if this procedure is appropriate to the specific incident. Monitor cardiac and pulmonary functions.

SECTION 7. SPILL, LEAK, AND DISPOSAL PROCEDURES

Spill/Leak: Notify safety personnel, evacuate unnecessary personnel, eliminate all sources of ignition immediately, and provide adequate explosion-proof ventilation. Cleanup personnel need protection against skin or eye contact with this liquid as well as inhalation of its vapor (see sect. 8). Contain large spills and collect waste or absorb it with an inert material such as sand, earth, or vermiculite. Use nonsparking tools to place waste liquid or absorbent into closable containers for disposal. Keep waste out of sewers, watersheds, and waterways. **Waste Disposal:** Contact your supplier or a licensed contractor for detailed recommendations. Follow Federal, state, and local regulations.

OSHA Designations
Listed as an Air Contaminant (29 CFR 1910.1000 Subpart Z).
EPA Designations (40 CFR 302.4)
CERCLA Hazardous Substance, Reportable Quantity: 1000 lbs (454 kg), per the Clean Water Act (CWA), §§ 311 (b) (4) and 307 (a).

SECTION 8. SPECIAL PROTECTION INFORMATION

Goggles: Always wear protective eyeglasses or chemical safety goggles. Where splashing is possible, wear a full face shield. Follow OSHA eye- and face-protection regulations (29 CFR 1910.133). **Respirator:** Wear a NIOSH-approved respirator per Genium reference 88 for the maximum-use concentrations and/or the exposure limits cited in section 2. Follow OSHA respirator regulations (29 CFR 1910.134). For emergency or nonroutine operations (spills or cleaning reactor vessels and storage tanks), wear an SCBA. **Warning:** Air-purifying respirators will *not* protect workers in oxygen-deficient atmospheres. **Other:** Wear impervious gloves, boots, aprons, and gauntlets, etc., to prevent prolonged or repeated skin contact with this material. **Ventilation:** Install and operate general and local maximum, explosion-proof ventilation systems powerful enough to maintain airborne levels of this material below the OSHA PEL standard cited in section 2. Local exhaust ventilation is preferred because it prevents dispersion of the contaminant into the general work area by eliminating it at its source. Consult the latest edition of Genium reference 103 for detailed recommendations. **Safety Stations:** Make emergency eyewash stations, safety/quick-drench showers, and washing facilities available in work areas. **Contaminated Equipment:** Contact lenses pose a special hazard; soft lenses may absorb irritants, and all lenses concentrate them. Do *not* wear contact lenses in any work area. Remove contaminated clothing and launder it before wearing it again; clean this material from shoes and equipment. **Comments:** Practice good personal hygiene; always wash thoroughly after using this material and before eating, drinking, smoking, using the toilet, or applying cosmetics. Keep it off your clothing and equipment. Avoid transferring it from your hands to your mouth while eating, drinking, or smoking. Do *not* eat, drink, or smoke in any work area. Do not inhale ethyl benzene vapor.

SECTION 9. SPECIAL PRECAUTIONS AND COMMENTS

Storage/Segregation: Store ethyl benzene in closed containers in a cool, dry, well-ventilated area away from sources of ignition and strong oxidizers. Protect containers from physical damage. **Special Handling/Storage:** Outside, isolated, detached, or remote storage is recommended for large quantities of ethyl benzene. Isolate bulk storage areas from acute fire hazards. **Engineering Controls:** Make sure all engineering systems (production, transportation) are of maximum explosion-proof design. To prevent static sparks, electrically ground and bond all containers, pipelines, etc., used in shipping, transferring, reacting, production, and sampling operations. **Other:** Use safety cans for transferring small amounts of ethyl benzene.

Transportation Data (49 CFR 172.101-2)

DOT Shipping Name: Ethyl Benzene
DOT Hazard Class: Flammable Liquid
ID No. UN1175
DOT Label: Flammable Liquid
DOT Packaging Exceptions: 49 CFR 173.118
DOT Packaging Requirements: 49 CFR 173.119

IMO Shipping Name: Ethylbenzene
IMO Hazard Class: 3.2
IMO Label: Flammable Liquid
IMDG Packaging Group: II

References: 1, 26, 38, 84-94, 100, 116, 117, 120, 122.

Judgments as to the suitability of information herein for purchaser's purposes are necessarily purchaser's responsibility. Therefore, although reasonable care has been taken in the preparation of such information, Genium Publishing Corp. extends no warranties, makes no representations and assumes no responsibility as to the accuracy or suitability of such information for application to purchaser's intended purposes or for consequences of its use.

Prepared by PJ Igoe, BS
Industrial Hygiene Review: DJ Wilson, CIH
Medical Review: W Silverman, MD

Copyright © 1988 by Genium Publishing Corporation

Material Safety Data Sheet

From Genium's Reference Collection
Genium Publishing Corporation
1145 Catalyn Street
Schenectady, NY 12303-1836 USA
(518) 377-8855

GENIUM PUBLISHING CORP.

No. 318

XYLENE (Mixed Isomers)
(Revision D)
Issued: November 1980
Revised: August 1988

SECTION 1. MATERIAL IDENTIFICATION

26

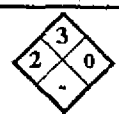
Material Name: XYLENE (Mixed Isomers)

Description (Origin/Uses): Used as a raw material for the production of benzoic acid, phthalic anhydride, isophthalic and terephthalic acids and their dimethyl esters in the manufacture of polyester fibers; in sterilizing catgut; with Canadian balsam as oil-immersion in microscopy; and as a cleaning agent in microscopic techniques.

Other Designations: Dimethylbenzene; Xylol; C_8H_{10}; CAS No. 1330-20-7

Manufacturer: Contact your supplier or distributor. Consult the latest edition of the *Chemicalweek Buyers' Guide* (Genium ref. 73) for a list of suppliers.

Comments: Although there are three different isomers of xylene (*ortho*, *meta*, and *para*), the health and physical hazards of all three isomers are very similar. This MSDS is written for a xylene mixture of all three isomers, which is usually commercial xylene.



NFPA

HMIS	
H	2
F	3
R	0
PPG*	
*See sect. 8	

R	1
I	3
S	2
K	3

SECTION 2. INGREDIENTS AND HAZARDS	%	EXPOSURE LIMITS
Xylene (Mixed Isomers), CAS No. 1330-20-7*	**	IDLH*** Level: 1000 ppm
o-Xylene, CAS No. 0095-47-6 *m*-Xylene, CAS No. 0108-38-3 *p*-Xylene, CAS No. 0106-42-3		**OSHA PEL** 8-Hr TWA: 100 ppm, 435 mg/m³
**Check with your supplier to determine if there are additions, contaminants, or impurities (such as benzene) that are present in reportable quantities per 29 CFR 1910.		**ACGIH TLVs, 1987-88** TLV-TWA: 100 ppm, 435 mg/m³ TLV-STEL: 150 ppm, 655 mg/m³
***Immediately dangerous to life and health.		
**** See NIOSH, *RTECS* (No. ZE2100000), for additional data with references to reproductive, irritative, and mutagenic effects.		**Toxicity Data** Human, Inhalation, TC_{Lo}: 200 ppm Man, Inhalation, LC_{Lo}: 10000 ppm/6 Hrs Rat, Oral, LD_{50}: 4300 mg/kg

SECTION 3. PHYSICAL DATA

Boiling Point: 275°F to 293°F (135°C to 145°C)*
Melting Point: -13°F (-25°C)
Evaporation Rate: 0.6 Relative to BuAc = 1
Specific Gravity (H_2O = 1): 0.86

Water Solubility (%): Insoluble
Molecular Weight: 106 Grams/Mole
% Volatile by Volume: Ca 100
Vapor Pressure: 7 to 9 Torrs at 68°F (20°C)
Vapor Density (Air = 1): 3.7

Appearance and Odor: A clear liquid; aromatic hydrocarbon odor.

*Materials with wider and narrower boiling ranges are commercially available.

SECTION 4. FIRE AND EXPLOSION DATA

Flash Point and Method	Autoignition Temperature	Flammability Limits in Air	LOWER	UPPER
			% by Volume	
81°F to 90°F (27°C to 32°C)	867°F (464°C)		1%	7%

Extinguishing Media: Use foam, dry chemical, or carbon dioxide. Use water sprays to reduce the rate of burning and to cool containers.

Unusual Fire or Explosion Hazards: Xylene vapor is heavier than air and may travel a considerable distance to a low-lying source of ignition and flash back.

Special Fire-fighting Procedures: Wear a self-contained breathing apparatus (SCBA) with a full facepiece operated in the pressure-demand or positive-pressure mode.

SECTION 5. REACTIVITY DATA

Xylene is stable in closed containers during routine operations. It does not undergo hazardous polymerization.

Chemical Incompatibilities: This material may react dangerously with strong oxidizers.

Conditions to Avoid: Avoid any exposure to sources of ignition and to strong oxidizers.

Hazardous Products of Decomposition: Carbon monoxide (CO) may be evolved during xylene fires.

Copyright © 1988 Genium Publishing Corporation.
Any commercial use or reproduction without the publisher's permission is prohibited.

Genium Publishing Corporation
1145 Catalyn Street
Schenectady, NY 12303-1836 USA
(518) 377-8854

Material Safety Data Sheets Collection:

Sheet No. 5
Chromic Acid and Chromates

Issued: 10/77 Revision: C, 7/91

Section 1. Material Identification

Chromic Acid (CrO_3) Description: Produced by roasting chromite ore with alkali or lime, leaching with calcium oxide, crystallizing the chromate or dichromate, and then treating it with an excess of sulfuric acid. Used in ceramic glazes, colored glass, dyes, batteries, explosives, water treatment, wood treatment and preservatives, refractories, copper stripping, aluminum anodizing, photomechanical processing, chromium metal plating, purifying oil and acetylene, hardening microscopic preparations, and manufacturing chromated copper arsenate; and as a corrosion inhibitor, a catalyst, an oxidizing agent in organic chemistry, and an etchant for plastics.

R 1
I 4
S 3*
K 0
* Percutaneous (broken skin)

NFPA



HMIS
H 3
F 0
R 1
PPG†
† Sec. 8

Other Designations: CAS No. 1333-82-0; chromic acid; chromic acid, solid (DOT); chromium anhydride; chromium (VI) oxide; chromium trioxide; chromium (6+) trioxide; monochromium trioxide; puratronic chromium trioxide. Chromic acid is the commonly used name, although true chromic acid (CrH_2O_4, CAS No. 7738-94-5) cannot be isolated from solution. Chromic acid and chromates (as CrO_3, CAS No. 7440-47-3).

Manufacturer: Contact your supplier or distributor. Consult latest *Chemical Week Buyers' Guide*(73) for a suppliers list.

Caution: A powerful oxidizer, chromic acid may explode on contact with reducing agents and cause ignition on contact with organic materials. This poison and human carcinogen is corrosive to skin and irritating to mucous membranes. Eye contact may cause permanent blindness.

Section 2. Ingredients and Occupational Exposure Limits

Chromic acid, 99% CrO_3

1990 OSHA PEL
Ceiling: 0.1 mg(CrO_3)/m³

1987 IDLH Level
30 mg/m³

1990-91 ACGIH TLVs
TWA: 0.05 mg(Cr)/m³
Ceiling: 0.1 mg/m³

1990 NIOSH REL
TWA: 0.025 mg(Cr(VI))/m³
Ceiling: 0.05 mg/m³/15 min (Cr(VI))

1985-86 Toxicity Data*
Rat, oral, LD_{50}: 80 mg/kg
Mouse, oral, LD_{50}: 127 mg/kg
Human, inhalation, TC_{Lo}: exposed continuously to 110 µg over 3 years. Toxic effects include tumorigenic (carcinogenic by *RTECS* criteria); sense organs and special senses (olfaction tumors); lungs, thorax, or respiration (tumors).
Dog, subcutaneous, LD_{Lo}: 330 mg/kg

* See NIOSH, *RTECS* (GB6650000), for additional mutative, reproductive, toxicity and tumorigenic data.

Section 3. Physical Data*

Boiling Point: Decomposes at 482 °F (250 °C) to $Cr_2O_3 + O_2$
Melting Point: 385 °F (196 °C)
Molecular Weight: 99.98
Specific Gravity: 2.7
Water Solubility: Soluble
Heat of Fusion: 37.7 cal/g
Appearance and Odor: Dark, purplish-red, prismatic, deliquescent (absorbs all moisture from air) crystals, or a granular powder with no detectable odor.

* These physical data apply only to chromic acid (CAS No. 1333-82-0).

Section 4. Fire and Explosion Data

Flash Point: None reported	Autoignition Temperature: None reported	LEL: None reported	UEL: None reported

Extinguishing Media: Chromic acid is noncombustible, but accelerates burning of combustibles (wood, paper, oil). For small fires, *use only water*, not dry chemical, carbon dioxide (CO_2), or halon.

Unusual Fire or Explosion Hazards: A powerful oxidizer, chromic acid ignites on contact with acetic acid and alcohol. It may react rapidly enough with organic materials to cause ignition. Containers may explode if involved in fire.

Special Fire-fighting Procedures: Isolate hazard area and deny entry. Since fire may produce toxic fumes, wear a self-contained breathing apparatus (SCBA) with a full facepiece operated in pressure-demand or positive-pressure mode. Cool fire-exposed containers with flooding amounts of water since the decomposing material may form a hot, viscous foam that can cause containers to rupture and explode. *Use caution!* For large fires, flood area from a safe distance, and cool containers from the side with a water spray until after fire is well out. If possible without risk, move containers. Stay away from ends of tanks. For massive fire in cargo area, use monitor nozzles or unmanned hose holder. Be aware of runoff from fire control methods. Do not release to sewers or waterways.

Section 5. Reactivity Data

Stability/Polymerization: Chromic acid is generally stable at room temperature in closed containers under normal storage and handling conditions. Hazardous polymerization cannot occur.

Chemical Incompatibilities: This material is incompatible with acetic acid, acetic anhydride, acetone, alcohols, alkali metals, ammonia, arsenic, anthracene, benzene, bromine penta fluorine, butyric acid, camphor, chromous sulfide, diethyl ether, glycerol, hydrogen sulfide, methyl alcohol, naphthalene, peroxyformic acid, phosphorus, potassium hexacyanoferrate, pyridine, selenium, sodium, and turpentine. Chromic acid ignites ethyl alcohol and many hydrocarbons.

Conditions to Avoid: Avoid excess heat and contact with combustible or organic materials.

Hazardous Products of Decomposition: Thermal oxidative decomposition of chromic acid can produce carbon dioxide, smoke, and irritating toxic fumes.

Section 6. Health Hazard Data

Carcinogenicity: The IARC and NTP list chromic acid and other forms of hexavalent (VI) chromium as human carcinogens.

Summary of Risks: Chromic acid is a poison and a powerful irritant to skin, eyes, and respiratory tract. Skin or lung sensitization (allergic reactions) may occur. Exposure can cause dermatitis (skin rash), asthma, pulmonary edema (fluid in lungs), kidney damage, a "chrome hole," or a perforation of the nasal septum (tissue between nostrils).

Medical Conditions Aggravated by Long-Term Exposure: Any chronic lung or skin condition.

Target Organs: Skin, respiratory tract (including nose, throat, airways, and lungs), and kidney.

Primary Entry Routes: Eyes, skin contact, inhalation, and ingestion.

Acute Effects: Inhalation may cause irritation or burning of nose, throat, and air passages, cough, wheezing, and shortness of breath. Higher exposures may cause pulmonary edema (fluid in lungs). Skin exposure may cause dermatitis (skin rash), irritation, burning, itching, redness, and ulceration (skin destruction) which may penetrate. Eye contact can cause irritation, burning, lacrimation (watering), loss of sight and permanent blindness if not removed quickly.

Chronic Effects: Chronic inhalation of excessive levels may cause epistaxis (nosebleed), "chrome holes," nasal congestion, tooth enamel erosion, chest pain, asthma (via allergic sensitization), bronchitis, or respiratory tract cancer. Chronic eye exposure may cause conjunctivitis. Skin contact

Continue on next page

Copyright © 1991 Genium Publishing Corporation.
Any commercial use or reproduction without the publisher's permission is prohibited.

SECTION 6. HEALTH HAZARD INFORMATION

Xylene is not listed as a carcinogen by the IARC, NTP, or OSHA.

Summary of Risks: Liquid xylene is a skin irritant and causes erythema, dryness, and defatting; prolonged contact may cause blistering. Inhaling xylene can depress the central nervous system (CNS), and ingesting it can result in gastrointestinal disturbance; and possibly hematemesis (vomiting blood). Effects on the eyes, kidneys, liver, lungs, and the CNS are also reported. **Medical Conditions Aggravated by Long-Term Exposure:** Problems with eyes, skin, central nervous system, kidneys, and liver may be worsened by exposure to xylene. **Target Organs:** CNS, eyes, gastrointestinal tract, blood, liver, kidneys, skin. **Primary Entry:** Inhalation, skin contact/absorption. **Acute Effects:** Dizziness; excitement; drowsiness; incoordination; staggering gait; irritation of eyes, nose, and throat; corneal vacuolization; anorexia; nausea; vomiting; abdominal pain; and dermatitis. **Chronic Effects:** Reversible eye damage, headache, loss of appetite, nervousness, pale skin, and skin rash.

FIRST AID: Eyes. Immediately flush eyes, including under the eyelids, gently but thoroughly with plenty of running water for at least 15 minutes. **Skin.** Immediately wash the affected area with soap and water. **Inhalation.** Remove the exposed person to fresh air; restore and/or support his or her breathing as needed. Have a trained person administer oxygen. **Ingestion.** Never give anything by mouth to someone who is unconscious or convulsing. Vomiting may occur spontaneously, but do not induce it. If vomiting should occur, keep exposed person's head below his or her hips to prevent aspiration (breathing the liquid xylene into the lungs). Severe hemorrhagic pneumonitis with grave, possibly fatal, pulmonary injury can occur from aspiring very small quantities of xylene.

GET MEDICAL HELP (IN PLANT, PARAMEDIC, COMMUNITY) FOR ALL EXPOSURES. Seek prompt medical assistance for further treatment, observation, and support after first aid. If exposure is severe, hospitilization for at least 72 hours with careful monitoring for delayed onset of pulmonary edema is recommended.

SECTION 7. SPILL, LEAK, AND DISPOSAL PROCEDURES

Spill/Leak: Notify safety personnel, provide ventilation, and eliminate all sources of ignition immediately. Cleanup personnel need protection against contact with and inhalation of xylene vapor (see sect. 8). Contain large spills and collect waste or absorb it with an inert material such as sand, earth, or vermiculite. Use nonsparking tools to place waste liquid or absorbent into closable containers for disposal. Keep waste out of sewers, watersheds, and waterways.

Waste Disposal: Contact your supplier or a licensed contractor for detailed recommendations. Follow Federal, state, and local regulations.

OSHA Designations

Air Contaminant (29 CFR 1910.1000 Subpart Z)

EPA Designations (40 CFR 302.4)

RCRA Hazardous Waste, No. U239

CERCLA Hazardous Substance, Reportable Quantity: 1000 lbs (454 kg), per the Clean Water Act (CWA), section 311 (b) (9)

SECTION 8. SPECIAL PROTECTION INFORMATION

Goggles: Always wear protective eyeglasses or chemical safety goggles. Where splashing is possible, wear a full face shield as a supplementary protective measure. Follow OSHA eye- and face-protection regulations (29 CFR 1910.133). **Respirator:** Use a NIOSH-approved respirator per the *NIOSH Pocket Guide to Chemical Hazards* for the maximum-use concentrations and/or the exposure limits cited in section 2. Follow OSHA respirator regulations (29 CFR 1910.134). For emergency or nonroutine use (leaks or cleaning reactor vessels and storage tanks), wear an SCBA with a full facepiece operated in the pressure-demand or positive-pressure mode. **Warning:** Air-purifying respirators will *not* protect workers in oxygen-deficient atmospheres. **Other:** Wear impervious gloves, boots, aprons, gauntlets, etc., as required by the specifics of the work operation to prevent prolonged or repeated skin contact with xylene. **Ventilation:** Install and operate general and local maximum, explosion-proof ventilation systems powerful enough to maintain airborne levels of xylene below the OSHA PEL standard cited in section 2. Local exhaust ventilation is preferred because it prevents dispersion of xylene into general work areas by eliminating it at its source. Consult the latest edition of Genium reference 103 for detailed recommendations. **Safety Stations:** Make eyewash stations, safety/quick-drench showers, and washing facilities available in areas of use and handling. **Contaminated Equipment:** Contact lenses pose a special hazard; soft lenses may absorb irritants and all lenses concentrate them. Do *not* wear contact lenses in any work area. Remove contaminated clothing and launder it before wearing it again; clean xylene from shoes and equipment. **Comments:** Practice good personal hygiene; always wash thoroughly after using this material. Keep it off of your clothing and equipment. Avoid transferring it from your hands to your mouth while eating, drinking, or smoking. Do *not* eat, drink, or smoke in any work area. Do not inhale xylene vapor.

SECTION 9. SPECIAL PRECAUTIONS AND COMMENTS

Storage/Segregation: Store xylene in a cool, dry, well-ventilated area away from sources of ignition and strong oxidizers. Protect containers from physical damage.

Special Handling/Storage: Make sure all engineering systems (production, transportation) are of maximum explosion-proof design. Ground and bond all containers, pipelines, etc., used in shipping, transferring, reacting, producing, and sampling operations.

Transportation Data (49 CFR 172.101-2)

DOT Shipping Name: Xylene	**DOT Label:** Flammable Liquid	**IMO Label:** Flammable Liquid
DOT ID No. UN1307	**DOT Hazard Class:** Flammable Liquid	**IMO Class:** 3.2 or 3.3

References: 1, 2, 12, 73, 84-94, 100, 103.

Judgments as to the suitability of information herein for purchaser's purposes are necessarily purchaser's responsibility. Therefore, although reasonable care has been taken in the preparation of such information, Genium Publishing Corp. extends no warranties, makes no representations and assumes no responsibility as to the accuracy or suitability of such information for application to purchaser's intended purposes or for consequences of its use.

Prepared by PJ Igoe, BS

Industrial Hygiene Review: DJ Wilson, CIH

Medical Review: MJ Hardies, MD

Copyright © 1988 Genium Publishing Corporation.
Any commercial use or reproduction without the publisher's permission is prohibited.

Section 6. Health Hazard Data, *continued*

can cause irritant or allergic contact dermatitis, or skin ulceration. Chronic systemic absorption could cause liver or kidney damage.

RST AID

ves: Gently lift the eyelids and flush immediately and continuously with flooding amounts of water until transported to an emergency medical cility. Do not let victim rub eyes or keep them tightly shut. Consult a physician immediately.

Skin: Rinse with flooding amounts of water for at least 15 min, and wash with a gentle soap. Promptly remove contaminated clothing. For redness, blistering, or persistent irritation, consult a physician.

halation: Remove exposed person to fresh air and support breathing as needed.

gestion: Never give anything by mouth to an unconscious or convulsing person. If ingested, have that *conscious* person drink 1 to 2 glasses of water. *Do not induce vomiting* since this worsens the victim's condition. *Do not* neutralize this acid.

After first aid, get appropriate in-plant, paramedic, or community medical support.

ote to Physicians: After decontamination and neutralization, treatment of acid burns is similar to that of thermal burns, although bullae and se necrotic tissue should be debrided. Update tetanus status. *For severe acid burns,* fluid resuscitation is critical to prevent mortality from povolemia and renal failure. Monitor serial vital signs, urine output, electrolytes, blood count, and urinalysis as clinically indicated. Neurovascular compromise distal to a circumferential extremity burn may require escharotomy or fasciotomy. *For inhalation exposures to acids,* a CXR, EKG, ABGs, PFTs, SMA, and CBC may aid in treatment. Evaluate and treat as indicated for reactive airways, upper airway obstruction and ncardiogenic pulmonary edema (possibly delayed onset). Although literature documentation is inadequate, a burst of steroids may help prevent velopment of sequelae such as reactive airways dysfunction syndrome or bronchilitis obliterans. For ocular exposures to acids, ensure adequate contamination. Determination of pH may be helpful. A Morgan Lens® and topical anesthesia may aid in irrigation. Perform fluorescein staining and slit lamp evaluation and consult an opthamalogist. Antibiotic ointments, mydriatic/cycloplegics, topical corticosteroids (after epithelial recovery), patching, and possibly anterior chamber paracentesis may be indicated depending on clinical presentation. Acutely and in follow-up, aluate as indicated for intraocular pressure, lacrimal and lid function, corneal integrity and infection. Urinary chromium is of questionable value.

ection 7. Spill, Leak, and Disposal Procedures

Spill/Leak: Notify safety personnel and evacuate all unnecessary personnel. Cleanup personnel should protect against dust inhalation and eye contact. Do not handle broken packages unless wearing appropriate personal protective equipment. Keep combustibles (wood, paper, etc.) away m spilled material. Whenever possible, use wet cleanup methods; if not, use vacuum cleanup. Remove spills immediately to prevent dust spersion. For a water spill, neutralize with agricultural lime, crushed limestone, or sodium bicarbonate. For a land spill, dig a pit, pond, or lagoon o contain material. If time permits, seal these with an impermeable, flexible membrane liner. Dike surface flow with soil, sand or foamed concrete. Follow applicable OSHA regulations (29 CFR 1910.120).

Environmental Transport: If allowed contact with soil, chromic acid, solid, lowers pH and may leach into water sources, causing an effect milar to acid rain's on water sources. This material's carcinogenicity makes it hazardous to the environment in its hexavalent state.

nvironmental Degradation: The recommended disposal means are reduction, precipitation, or ion exchange. Landfill disposal is not recommended since it raises soil acidity.

Disposal: Contact your supplier or a licensed contractor for detailed recommendations. Follow applicable Federal, state, and local regulations.

PA Designations

sted as a RCRA Hazardous Waste (40 CFR 261.22): Corrosive waste

CRA Hazardous Waste (40 CFR 261.33): Not listed

Listed as a CERCLA Hazardous Substance* (40 CFR 302.4), Reportable Quantity (RQ): 10 lb (4.54 kg) [*per Clean Water Act, Sec. 311(b)(4)]†

SARA Extremely Hazardous Substance (40 CFR 355): Not listed

SRA Toxic Chemical (40 CFR 372.65): Not listed

SHA Designations

sted as an Air Contaminant (29 CFR 1910.1000, Tables Z-1-A and Z-2)

† Chromic acid (CAS No. 7738-94-5) is listed.

ection 8. Special Protection Data

ggles: Wear protective eyeglasses or chemical safety goggles, per OSHA eye- and face-protection regulations (29 CFR 1910.133).

Respirator: Seek professional advice prior to respirator selection and use. Follow OSHA respirator regulations (29 CFR 1910.134) and, if necessary, wear a NIOSH-approved respirator. For 0.5-g/m³ concentrations (if not fumes), use any dust and mist respirator except single-use and quarter-mask respirators. For 1.25-g/m³ concentrations, use any powered air-purifying respirator with a high-efficiency particulate filter. For -m/m³ concentrations, use any air-purifying full facepiece respirator with a high-efficiency particulate filter. For 30-g/m³ concentrations, use y supplied air respirator with a full facepiece and operated in a pressure-demand or other positive-pressure mode. All concentrations may require eye protection. For emergency or nonroutine operations (cleaning spills, reactor vessels, or storage tanks), wear an SCBA. *Warning! Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.*

ther: Wear impervious gloves, boots, aprons, and gauntlets to prevent skin contact.

ntilation: Provide general and local ventilation systems to maintain airborne concentrations below occupational exposure levels. Local exhaust ntilation is preferred since it prevents contaminant dispersion into work area by controlling it at its source.[103]

Safety Stations: Make available in the work area emergency eyewash stations, safety/quick-drench showers, and washing facilities.

Contaminated Equipment: Contact lenses may minimize or worsen eye injuries. In some cases, soft lenses can actually protect eyes, not worsen rneal damage, due to strong chemicals. In other cases, chemical entrapment is presumed a possible hazard. Since contact lens use in industry is ntroversial, establish your own policy. Remove this material from your shoes and equipment. Launder contaminated clothing before wearing.

mments: Never eat, drink, or smoke in work areas. Practice good personal hygiene after using this material, especially before eating, drinking, smoking, using the toilet, or applying cosmetics.

ection 9. Special Precautions and Comments

orage Requirements: Store in glass bottles, cans, or drums. Protect against physical damage. Separate from combustible, organic, or other easily oxidizable materials. Protect from excess moisture which could cause containers to rust. Do not store on wooden floors. Store away from foodstuffs and flammable liquids and solids.

gineering Controls: Avoid dust inhalation and skin or eye contact. Institute a respiratory protection program that includes regular training, intenance, inspection, and evaluation. Practice good housekeeping procedures.

her Precautions: Institute preplacement and periodic medical exams of exposed workers with attention to the skin and respiratory tract. Consider preplacement and periodic chest radiographs.

Transportation Data (49 CFR 172.101, .102)

OT Shipping Name: Chromic acid, solid
OT Hazard Class: Oxidizer
D No.: NA1463
DOT Label: Oxidizer
DOT Packaging Exceptions: 173.153
OT Packaging Requirements: 173.164

IMO Shipping Name: Chromium trioxide, anhydrous
IMO Hazard Class: 5.1
ID No.: UN1463
IMO Label: Oxidizer, Corrosive
IMDG Packaging Group: II

MSDS Collection References: 26, 38, 73, 85, 100, 101, 103, 124, 126, 127, 132, 133, 136, 138, 139, 140, 143, 142, 145, 148, 159

Prepared by: M Gannon, BA; Industrial Hygiene Review: DJ Wilson, CIH; Medical Review: MJ Upfal, MD, MPH; Edited by: JR Stuart, MS

yright © 1991 by Genium Publishing Corporation. Any commercial use or reproduction without the publisher's permission is prohibited. Judgments as to the suitability of information herein for the purchaser's purposes necessarily the purchaser's responsibility. Although reasonable care has been taken in the preparation of such information, Genium Publishing Corporation extends no warranties, makes no representations, and assumes responsibility as to the accuracy or suitability of such information for application to the purchaser's intended purpose or for consequences of its use.

Material Safety Data Sheet

Genium Publishing Corporation
1145 Catalyn Street
Schenectady, NY 12303-1836 USA
(518) 377-8855

GENIUM PUBLISHING CORP.

No. 182

CHROMIUM (III) OXIDE

Issued: April 1986

SECTION 1. MATERIAL IDENTIFICATION

MATERIAL NAME: CHROMIUM (III) OXIDE

OTHER DESIGNATIONS: Chrome Oxide, Chromic Oxide, Chromium Sesquioxide, Cr_2O_3, CAS #1308-38-9

MANUFACTURER/SUPPLIER: Available from several suppliers, including: Ciba-Geigy Corp., Plastics, Pigments, and Additives Division, Three Skyline Drive, Hawthorne, NY 10532; Telephone: (914) 347-4700.

HMIS
H Chronic
F 0
R 0
PPE*
* See Sect. 8



SECTION 2. INGREDIENTS AND HAZARDS

	%	HAZARD DATA
Chromium (III) Oxide, Cr_2O_3, CAS #1308-38-9	>99	ACGIH TLV, 8-hr TWA: 0.5 mg/m^3* ---------- OSHA PEL, 8-hr TWA: 1 mg/m^3**

* Current (1985-86) ACGIH TLV for chromium (III) Compounds, as Cr.

** Current OSHA PEL for chromium metal and insoluble salts, as Cr.

SECTION 3. PHYSICAL DATA

Boiling Point ... 7232°F (4000°C)
Melting Point ... 4415°F (2435°C)
Specific Gravity ... 5.21
Vapor Pressure @ 25°C ... Negligible
Solubility in Water ... Insoluble
Molecular Weight ... 152

Appearance and odor: Green granules, crystals, or powder. No odor.

SECTION 4. FIRE AND EXPLOSION DATA

Flash Point and Method	Autoignition Temp.	Flammability Limits In Air	LOWER	UPPER
Not Found	Not Found	Not Found -- -		

EXTINGUISHING MEDIA: Chromic oxide is not combustible. Use extinguishing agents that are suitable for the surrounding fire.

UNUSUAL FIRE/EXPLOSION HAZARDS: None

SPECIAL FIRE-FIGHTING PROCEDURES: Fire fighters should wear self-contained breathing apparatus and full protective gear for protection against dust, mist, or fumes that may be generated during fire-fighting activities.

SECTION 5. REACTIVITY DATA

Chromium oxide is stable under normal conditions.

Hazardous polymerization will not occur.

INCOMPATIBILITIES: Chromic oxide can react vigorously with lithium, chlorine trifluoride, oxygen difluoride, and molten alkali. An explosion may occur on contact with glycerol.

HAZARDOUS DECOMPOSITION PRODUCTS: None.

Copyright © 1986 Genium Publishing Corporation.
Any commercial use or reproduction without the publisher's permission is prohibited.

SECTION 6. HEALTH HAZARD INFORMATION TLV

CARCINOGENIC ASSESSMENT: The IARC and NTP list "chromium and certain chromium compounds" as suspected carcinogens. Chromic oxide is not specifically cited. Hexavalent chromium compounds are those most generally associated with carcinogenic effects.

PRIMARY ROUTES OF ENTRY: This material can enter the body if it is inhaled or swallowed. EFFECTS OF OVEREXPOSURE: Trivalent chromium compounds (such as Cr_2O_3) are considered to exhibit a low degree of toxicity. Excessive concentrations of airborne dust may irritate the nose, throat, and respiratory tract. Prolonged overexposure may result in pulmonary changes. Skin and eye contact may cause irritation.

FIRST AID: EYE CONTACT: Flush eyes, including under the eyelids, with a gentle flow of running water to remove particles. If irritation persists, seek medical attention.* SKIN CONTACT: Thoroughly wash contaminated area with mild soap and water. Seek medical attention if irritation persists.* INHALATION: Remove victim from exposure. Seek medical attention if irritation or discomfort persist or if other symptoms develop.* INGESTION: If victim is conscious, give him a large quantity of milk or water to drink. Get medical assistance.*

* GET MEDICAL ASSISTANCE = In plant, paramedic, community. Get medical help for further treatment, observation, and support after first aid, if indicated.

SECTION 7. SPILL, LEAK, AND DISPOSAL PROCEDURES

CLEANUP PROCEDURES: Carefully scoop up or vacuum spilled material into a suitable container. Avoid generating dust. Cleanup personnel should wear gloves, goggles, and an approved respirator.

DISPOSAL: Reclaim material when possible. Unsalvageable waste may be disposed of in an approved landfill. Follow Federal, state, and local regulations.

Reportable spill quantity: None given in 40 CFR 117.3.

EPA Hazardous Waste Number: D0007 (EP Toxic 40 CFR 261.24). Applies to waste containing leachable chromium using EPA's extraction procedure.

SECTION 8. SPECIAL PROTECTION INFORMATION

VENTILATION: Use local exhaust ventilation to maintain airborne dust levels below the TLV. RESPIRATORS: Where airborne levels exceed the TLV, NIOSH-approved respirators with appropriate protection factors should be worn. High-efficiency particulate respirators are suitable for concentrations up to 10 mg/m^3. Respirator usage must be in accordance with OSHA requirements (29 CFR 1910.134).

OTHER PROTECTIVE EQUIPMENT: Dustproof goggles and gloves should be worn when handling this material. Protective clothing should be worn as required by the work situation to prevent prolonged or repeated skin contact.

Eyewash stations and washing facilities should be readily accessible to employees handling this material.

Contact lenses pose a special hazard; soft lenses may absorb irritants and all lenses concentrate them.

SECTION 9. SPECIAL PRECAUTIONS AND COMMENTS

PRECAUTIONS IN STORAGE: Store in tightly closed containers away from incompatible materials (see sect. 5). Protect containers from physical damage.

PRECAUTIONS IN HANDLING: Maintain good housekeeping procedures to prevent accumulating dust. Use procedures that minimize dust generation. Use good personal hygiene: launder contaminated clothing before reuse; wash exposed skin after handling; wash hands before eating, drinking, or smoking.

Avoid skin/eye contact and inhalation. Use with adequate ventilation. Do not ingest.

DOT Hazard Class: Not listed in hazardous materials tables (49 CFR 172.101 or 172.102).

Data Source(s) Code: 1, 2, 4, 5, 9, 12, 14, 27, 44, 58, 61, 62, 84. CV

Judgements as to the suitability of information herein for purchaser's purposes are necessarily purchaser's responsibility. Therefore, although reasonable care has been taken in the preparation of such information, Genium Publishing Corp. extends no warranties, makes no representations and assumes no responsibility as to the accuracy or suitability of such information for application to purchaser's intended purposes or for consequences of its use.

Approvals JO Rennecco

Indust. Hygiene/Safety

Medical Review

Copyright © 1986 Genium Publishing Corporation. Any commercial use or reproduction without the publisher's permission is prohibited.

Copyright © April 1, 1986

APPENDIX D
Treadwell & Rollo, Inc.
15 October 1992
Soil Quality Assessment

SOIL QUALITY ASSESSMENT
Industrial Way Properties
Brisbane, California

Kessler & Kessler
Alameda, California

15 October 1992
Project 1373A

TREADWELL & ROLLO, INC.
Consulting Engineers and Scientists
San Francisco, California

TREADWELL & ROLLO, INC.
Consulting Engineers and Scientists
353 Sacramento Street, Suite 800
San Francisco, California 94111
(415) 955-9040

15 October 1992
Project 1373A

Ms. Elizabeth Rouan
Office of Environmental Health
San Mateo County Department of Health Services
590 Hamilton Street
Redwood City, California 94063

Subject: Soil Quality Assessment
Industrial Way Properties
Brisbane, California

Dear Ms. Rouan:

On behalf of our client, Kessler & Kessler, enclosed please find the report entitled "Soil Quality Assessment" for the above-referenced site. The report summarizes the results of a subsurface investigation conducted at the site in August 1992. The report also includes results for a previous investigation performed by Geomatrix Consultants in November 1991 as you requested in your letter to our client dated 14 September 1992.

The elevated concentrations of lead in site soil near 350 Industrial Way is likely not attributable to contamination from leaded gasoline. Rather, the concentrations of lead and copper in site soil in the southern portion of the Industrial Way Properties is likely attributable to the past use of this portion of the property as a disposal area during the period of time that Southern Pacific owned the site. Please call either of the undersigned or Philip T. Tringale if you have questions.

Sincerely yours,
TREADWELL & ROLLO, INC.

Sharon P. Eckard

Sharon P. Eckard, R.G.
Project Geologist

Donald D. Treadwell

Donald D. Treadwell, P.E.
Principal Engineer

SPE:gej
1373A006.SPE

cc: Leslie M. Kessler, Esq.
Rex Scatena, Esq.

SOIL QUALITY ASSESSMENT
INDUSTRIAL WAY PROPERTIES
Brisbane, California

1.0 INTRODUCTION

This report presents the results of a subsurface investigation performed by Treadwell & Rollo, Inc. at the Industrial Way Properties site ("site") in Brisbane (Figure 1). This investigation was performed in accordance with our workplan dated 23 July 1992.

The site is bounded on the west by Bayshore Boulevard and on the east by the Bayshore Railyard site. It includes the properties at 21 through 400 Industrial Way. Specifically, the borings for this investigation were drilled at or near 21, 60, 80, 131, 190, 250, 285, 340, 360, and 400 Industrial Way.

2.0 PURPOSE AND SCOPE

The purpose of this work was to assess the possible presence and characterize the lateral and vertical extent of Bunker C oil, lead, and copper in the soil at the site. The scope of work for this investigation included:

- contacting Underground Services Alert to mark known underground utility lines on public property in the site vicinity and a private utility locator to mark underground utilities on private property

- o continuously coring 11 soil borings (B-1 through B-11) and obtaining soil samples to total depths ranging from 9.5 to 19.5 feet
- o submitting a total of 23 soil samples to Curtis & Tompkins, Ltd., Analytical Laboratories in Berkeley, California for analysis of Bunker C oil by EPA Test Method 8015 (modified), copper, by EPA Test Method 6010, and 20 samples for analysis of lead by EPA Test Method 6010 or 7420
- o surveying the boring elevations
- o preparing this report.

3.0 FIELD EXPLORATION

The investigation consisted of drilling and sampling 11 borings (B-1 through B-11) to depths ranging from 9.5 to 19.5 feet below the ground surface. The total depths of the borings were determined by the presence of native soil such as Bay Mud. Borings were drilled approximately 2 to 3 feet into the native soil and the boring locations are shown on Figure 2. The boring logs are presented in Appendix A.

The drilling operations were performed by Gregg Drilling of Concord, California under the direction of Treadwell & Rollo on 20 and 21 August 1992. The boreholes were advanced using a truck-mounted, six-inch diameter, hollow-stem auger rig equipped with a coring system. The augers were steam-cleaned prior to use to minimize the potential for cross-contamination. The sampling equipment was cleaned between sampling intervals with a detergent solution and thoroughly rinsed.

Soil samples were collected using a five-foot-long, split tube barrel sampler with an inner diameter of 2.5 inches and an outer diameter of 3.0 inches. Samples were obtained by advancing the sampler approximately 4.5 to 5 feet through the hollow-stem augers. After the sampler was cored to the desired depth, it was retrieved from the borehole and the

soil was examined for odors, visual indicators of possible contamination, and lithology. The soil was classified according to the Unified Soil Classification System.

Each soil core was screened for the presence of volatile organic vapors using a portable organic vapor meter (OVM). The OVM uses a photo-ionization detector to detect the presence of volatile organic vapors. Samples for chemical analysis were selected from depths that exhibited visual indications of apparent hydrocarbon contamination, or were representative of fill material at depth intervals of a maximum of five feet, or at distinct changes in lithology.

All samples selected for chemical analysis were collected from depths above the water table. Selected soil samples were extracted from the retrieved core and placed in glass jars, sealed, labeled, and stored in an ice-filled chest for delivery to the analytical laboratory. A summary of the soil samples retrieved from the continuous cores is presented on Table 1. All samples were delivered under chain-of-custody protocol to Curtis & Tompkins, Ltd.

The borings were backfilled to the ground surface with a cement/bentonite grout following their completion. The soil cuttings were placed in 55-gallon drums, sealed, labeled, and are being temporarily stored at the site.

4.0 ANALYTICAL TESTING

Forty soil samples were submitted for chemical analysis of Bunker C oil by EPA Test Method 8015 (modified), lead by EPA Test Method 6010 or 7420, and copper by EPA Test Method 6010. The laboratory analytical data are presented in Appendix B.

The soil samples are currently being stored in the laboratory cold storage for up to a period of six months to allow for possible additional metal analysis. This time period will expire in February 1993.

5.0 RESULTS

The lithology and analytical results are discussed below. The boring logs are presented in Appendix A and the laboratory analytical data are presented in Appendix B.

5.1 Lithology

The lithology observed at the site is characterized by approximately 2 to 15 feet of brown to gray, or olive, sandy clay to silty clay fill material overlying Bay Mud. The fill material contains varying amounts of gravel, wood, rubble, and brick fragments. Bay Mud was not encountered in borings B-1, B-2, and B-4. In two of these three locations, fill overlies yellow-brown sandy to clayey gravel which may be weathered colluvium from underlying bedrock (B-2 and B-4). In the third boring, the fill material overlies native yellow-brown silty clay soil (B-1). A 1/2- to 2-foot-thick clayey sand layer with varying amounts of gravel was observed at the northern end of the site in borings B-9, B-10, and B-11 at depths ranging from approximately 4 to 5 feet to 8 to 9 feet.

Visual observations of oily liquid, sheen, or odors suggest the presence of petroleum hydrocarbons in fill material encountered in borings B-2, B-5, B-6, B-7, B-8, and B-11. Concrete slabs were encountered in borings B-6, B-7, and B-10.

5.2 Chemical Analyses

All soil samples retrieved from the core were submitted to the analytical laboratory for analysis or storage. A summary of the analytical results is presented on Table 1. The analytical results are presented graphically on Figure 3. The results for each constituent are discussed separately below.

The chemical analytical results include previous soil sample data collected by Geomatrix Consultants from soil borings SB-2, SB-4, SB-5, SB-6, SB-7, and SB-8. Borehole SB-8 was converted into monitoring well MW-1 by Geomatrix Consultants in November 1991. The Geomatrix field logs of borings SB-1 through SB-7, and the boring log and well construction detail for SB-8/MW-1 are presented in Appendix C. Soil samples collected during the previous investigation were analyzed for TPH as gasoline (TPHg), benzene, toluene, ethylbenzene, and xylenes by EPA Test Methods 5030/8020 and 5030/8015, and lead and copper by EPA Test Method 6010. The results are presented on Table 2. The analytical laboratory results provided by Geomatrix Consultants are in Appendix D.

Bunker C Oil

Bunker C oil was not detected in the 23 soil samples submitted for analysis from borings B-1 through B-11 at or above reporting limits of 25 milligrams per kilogram (mg/kg) to 250 mg/kg. The reporting limit for one soil sample, B-8, No. 1, was increased to 2,500 mg/kg, adjusted for elevated concentrations of hydrocarbons in the sample.

Total Petroleum Hydrocarbons

Laboratory staff observations of the analytical chromatograms for Bunker C oil indicated the presence of petroleum hydrocarbons other than Bunker C oil. Reference standards for diesel and kerosene were also run by the laboratory as part of its routine analytical procedure.

Total petroleum hydrocarbons as diesel (TPHd) were detected in 17 of the 23 samples analyzed. Results ranged from non-detectable (ND) concentrations at or above a reporting limit of 1 mg/kg to 15,000 mg/kg. TPHd concentrations were highest in the soil samples from boring B-8 at 1,000 mg/kg (7 to 8 feet) and 15,000 mg/kg (3 to 4 feet). TPHd concentrations in the remaining samples ranged from 3 mg/kg to 580 mg/kg. Total petroleum hydrocarbons as kerosene were not detected in the samples analyzed.

Results from the previous investigation conducted by Geomatrix Consultants indicated the presence of TPHg ranging from 2 mg/kg to 33 mg/kg and benzene concentrations ranging from 0.3 mg/kg to 0.5 mg/kg in three of seven soil samples submitted for analysis. The TPHg and benzene were detected in soil samples from borings SB-5, SB-7, and SB-8. These constituents were not detected in the remaining samples at or above the applicable reporting limits. The reporting limits were 0.02 mg/kg for benzene, toluene, and ethylbenzene, 0.07 mg/kg for xylenes, and 2 mg/kg for TPHg.

Lead

Lead concentrations ranged from less than 3 mg/kg to 3,000 mg/kg in the 20 samples analyzed. Three samples exceeded the State of California Total Threshold Limit Concentration (TTLC) for lead of 1,000 mg/kg. These samples were obtained from borings B-5 at 7.0 to 9.0 feet (3,000 mg/kg), B-6 from 3.5 to 4.5 feet (2,500 mg/kg), and 6.0 to 6.5 feet (1,600 mg/kg). Elevated concentrations of lead at or exceeding ten times the Soluble Threshold Limit Concentration (STLC) of 50 mg/kg were detected in five samples from borings B-1, B-2, B-7, B-8, and B-11. The lead concentrations in these samples ranged from 50 mg/kg in B-7 to 700 mg/kg in B-8.

Lead analyses were not performed on samples from boring B-3 as previous data in this vicinity were available. Previous data near B-3 were collected in soil borings SB-2, SB-4, SB-5, SB-6, SB-7, and SB-8 by Geomatrix Consultants in November 1991. These data, presented on Table 2, indicate lead concentrations ranging from 110 mg/kg to 19,000 mg/kg. The 19,000 mg/kg value was detected in a soil sample obtained from the boring drilled for monitoring well MW-1.

Geomatrix Consultants observed metal slag in the fill material in soil borings SB-1 through SB-6 and in boring SB-8 near the water table, which may be the source of the high lead concentrations in these borings. Metal slag was not observed in borings B-1 through B-11.

Copper

Copper concentrations ranged from 9 mg/kg to 1,300 mg/kg in the 23 samples analyzed from borings B-1 through B-11. None of the 23 samples exceeded the TTLC for copper of 2,500 mg/kg. Elevated concentrations of copper that exceeded ten times the STLC for copper of 250 mg/kg were detected in five samples from borings B-3, B-5, and B-6. The copper concentrations in these samples ranged from 440 mg/kg in B-6 to 1,300 mg/kg in B-3.

Previous data for copper concentrations in soil borings SB-2, SB-4, SB-5, SB-6, SB-7, and SB-8 were obtained by Geomatrix Consultants in January 1992. These data, presented on Table 2, indicate copper concentrations ranging from 32 mg/kg to 5,200 mg/kg. Only one of these samples, SB-5-12, exceeds the copper TTLC of 2,500 mg/kg. Elevated concentrations of copper exceeding ten times the STLC of 250 mg/kg were detected in five samples from borings SB-2, SB-4, SB-6, SB-7, and SB-8/MW-1. The copper concentrations in these samples ranged from 330 mg/kg to 1,100 mg/kg.

5.3 Discussion and Conclusion

The Industrial Way Properties site is adjacent to the Bayshore Railyard Site, a 180-acre parcel known to be heavily contaminated with a variety of constituents in soil and groundwater. The Bayshore Railyard Site is under active regulatory supervision, has been extensively investigated, and its remedial action plan is expected to be publicly available by late October 1992. The contaminants of concern at the Bayshore Railyard Site in areas adjacent to the site that are the subject of this report include Bunker C oil, petroleum hydrocarbons (primarily waste oils and diesel), and metals.

The consultant for the Bayshore Railyard Site has reported (Levine-Fricke, "Supplemental Remedial Investigation Data Study Report, The Bayshore Railyard, Brisbane, California", 31 July 1990) that contaminants emanating from that site have migrated to and impacted soil and groundwater quality on some areas of the Industrial

Way Properties site. The testing program for the Industrial Way Properties site was designed, in part, to assess the lateral and vertical limits of these contaminants. The results of the investigation reported herein indicate the following:

- Bunker C oil was not detected in the soil samples analyzed during this investigation at or above the specified reporting limits
- TPHd, lead, and copper were detected in elevated concentrations in eight of the 11 borings
- lead concentrations exceeded the TTLC in soil from borings B-5, B-6, and in previous borings SB-2, SB-4, SB-5, SB-6, SB-7, and SB-8
- copper concentrations exceeded the TTLC in soil from previous boring SB-5.

Based on these results, we believe the lateral extent of Bunker C oil apparently does not extend onto the Industrial Way Properties site farther west of the approximate boundary indicated by Levine-Fricke (July 1990). However, the on-site concentrations of TPHd are highest in boring B-8. B-8 is in the vicinity of the former oil tank at the adjacent Bayshore Railyard site which is known to be contaminated with Bunker C oil and lighter hydrocarbons such as TPHd. Detectable concentrations of TPHd in soil in the vicinity of the former turntable and oil tank areas at the railyard site range from 5 to 13,000 mg/kg (Levine-Fricke, July 1990). The concentrations of TPHd in B-8 may be attributable to migration from the former oil tank area. Other concentrations of TPHd in on-site soil may have originated from potential sources from on-site activities, or from potentially hydrocarbon-containing imported fill material.

Similarly, the elevated lead and copper concentrations detected in on-site soil may be attributed to one of three sources: the imported fill material with potentially high metals concentrations, potential sources from on-site activities, and the use of a portion of the site as an extension of the "South Disposal Area" at the adjacent Bayshore Railyard site. The observation of metal slag in borings SB-1 through SB-6 and SB-8 suggests the high

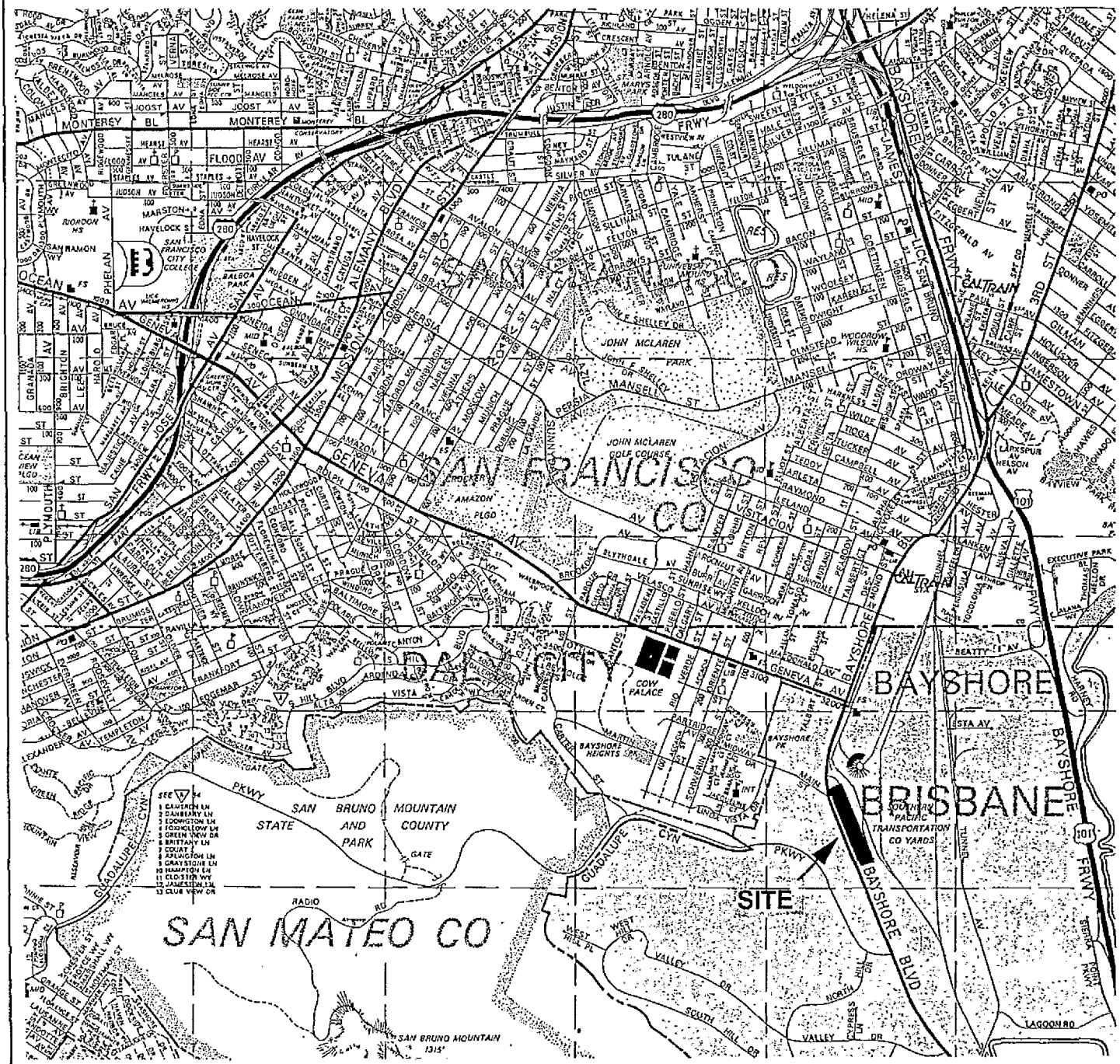
lead and copper concentrations found in this area are likely related to the disposal practices in the vicinity of the South Disposal Area. Metal slag was also commonly observed in the borings drilled in the South Disposal Area (Levine-Fricke, July 1990), where the presence of metal slag coincided with the highest concentrations of metals detected in the soil samples.

Subsurface investigations of the Industrial Way properties site and the adjacent Bayshore Railyard site have been conducted most recently by Treadwell & Rollo and Levine-Fricke, respectively. Additional data is available from investigations conducted by previous consultants. These data suggest there are similarities between the types and locations of known contaminants on the Bayshore Railyard Site and the types of contaminants on the Industrial Way Properties site. Specifically, similarities exist on portions of the Industrial Way site in areas near the South Disposal Area and the former oil tank area on the Bayshore Railyard site. Based on these data, we believe it is likely that historical activities and present conditions on the Bayshore Railyard Site have degraded the quality of the subsurface on the Industrial Way Properties site.

FIGURES

Figure 1 - Site Vicinity Map
Figure 2 - Soil Boring Location Map
Figure 3 - Hydrocarbons and Metals Distribution Map

153805



Reference: Thomas Bros. Guide
San Mateo County, 1990.

INDUSTRIAL WAY PROPERTIES **KESSLER & KESSLER** Brisbane, California	**SITE VICINITY MAP**
TREADWELL & ROLLO, INC. Consulting Engineers and Scientists	Project No. 1373A | Figure 1

BRISBANE
LANDFILL
(1933? – PRESENT)

N

SOUTH
DITCH

400
MOTHER'S
COOKIES

B-1

SB-6
B-3
MW-1
SB-5
SB-4
SB-1
SB-3
SB-2
SB-7

B-2

NORTH
DITCH

MIDDLE
DITCH

SURFACE DRAINAGE

OIL TANK
AREA

FORMER
OIL TANK

MACHINE
SHOP

285
HIDE & GLUE
PLAN

B-5

300–312
BONE STORAGE

B-4

B-6

K-1

290–296
CONSOLIDATED
CHEMICAL INDUSTRIES

250
GRANNY GOOSE
(GLUE WORKS)

INDUSTRIAL WAY

200

131

B-8 151–171

TURN–
TABLE

NTABLE AREA

ROUND
HOUSE

B-11

AUTOMOBILE
REFINISHING
21–27

MOORE CO.
55

551

B-9

140–190
B-7
WAREHOUSE

60–130
FERTILIZER PLANT

10
STA-
TUE
CO.

B-10

BAYSHORE BLVD.

0 100 200 FEET

EXPLANATION:

- Approximate location of monitoring well
- Approximate location of soil boring

NOTE: Figure modified from Levine-Fricke, 31 July 1990

INDUSTRIAL WAY PROPERTIES
KESSLER & KESSLER
Brisbane, California

SOIL BORING LOCATION MAP

Project No. 1373A | Figure 2

TREADWELL & ROLLO, INC.
Consulting Engineers and Scientists

BRISBANE
LANDFILL
(1933? – PRESENT)

EXPLANATION:

- Approximate location of monitoring well
- Approximate location of soil boring

Depth (feet)	Lead (mg/kg)	Copper (mg/kg)	Bunker "C" Oil (mg/kg)	TPHd (mg/kg)
4.0	20	55	ND	6

N.A. not analyzed
N.D. not detected

3.5	30	29	ND	23
7.5	140	50	ND	5
9.0	20	13	ND	ND

2.5	NA	77	ND	8
7.0	NA	1300	ND	62
12.0	NA	1100	ND	7

12.5	3,700	1,100	NA	NA

13	19,000	650	NA	NA

13	4,100	910	NA	NA

4.5	30	26	ND	7
7.0	3000	620	ND	15

12	6,700	5,200	NA	NA
14.5	110	32	NA	NA

13	5,400	670	NA	NA

10.5	4,100	330	NA	NA

4.0	160	110	ND	290
8.0	20	13	ND	ND

4.0	20	19	ND	ND
8.0	20	20	ND	ND

3.0	700	23	ND	15,000
7.0	20	14	ND	1,000

3.5	2500	745	ND	50
6.0	1600	440	ND	360

2.5	210	65	ND	400

7.0	50	27	ND	4
8.5	20	24	ND	580

2.5	20	39	ND	ND
7.0	20	24	ND	47

4.0	20	32	ND	3
5.5	ND	9	ND	ND

NOTE: Figure modified from Levine-Fricke, 31 July 1990

SOUTH DITCH
MIDDLE DITCH
NORTH DITCH
SURFACE DRAINAGE
OIL TANK AREA
TURN-TABLE AREA
TURN-TABLE
MACHINE SHOP
HIDE & GLUE PLAN
CONSOLIDATED CHEMICAL INDUSTRIES
GRANNY GOOSE (GLUE WORKS)
BONE STORAGE
MOTHER'S COOKIES
AUTOMOBILE REFINISHING
MOORE CO.
WAREHOUSE
FERTILIZER PLANT
STATUE CO.
INDUSTRIAL WAY
BAYSHORE BLVD.
B-1
B-2
B-3
B-4
B-5
B-6
B-7
B-8
B-9
B-10
B-11
K-1
MW-1
SB-1
SB-2
SB-3
SB-4
SB-5
SB-6
SB-7

0 100 200 FEET

INDUSTRIAL WAY PROPERTIES
KESSLER & KESSLER
Brisbane, California

HYDROCARBONS AND METALS DISTRIBUTION MAP

Project No. 1373A | Figure 3

TREADWELL & ROLLO, INC.
Consulting Engineers and Scientists

TABLES

TABLE 1
SUMMARY OF ANALYTICAL RESULTS
INDUSTRIAL WAY PROPERTIES
Brisbane, California

Boring Number	Sample Depth (feet)	Surface Elevation (feet)	Sample Elevation (feet)	Lead (mg/kg)	Copper (mg/kg)	Bunker "C" Oil (mg/kg)	TPH Diesel (mg/kg)
B- 1	3.5 - 4.5	19.88	16.38 - 15.38	30	29	ND	23
B- 1	7.5 - 8.0		12.38 - 11.88	140	50	ND	5
B- 1	9.0 - 10.0		10.88 - 9.88	20	13	ND	ND
B- 2	4.0 - 4.5	19.14	15.14 - 14.64	160	110	ND	290
B- 2	8.0 - 9.0		11.14 - 10.14	20	13	ND	ND
B- 3	2.5 - 4.5	17.09	14.59 - 12.59	NA	77	ND	8
B- 3	7.0 - 8.0		10.09 - 9.09	NA	1,300	ND	62
B- 3	12.0 - 13.0		5.09 - 4.09	NA	1,100	ND	7
B- 4	4.0 - 4.5	17.93	13.93 - 13.43	20	19	ND	ND
B- 4	8.0 - 8.5		9.93 - 9.43	20	20	ND	ND
B- 5	4.5 - 5.0	14.52	10.02 - 9.52	30	26	ND	7
B- 5	7.0 - 9.0		7.52 - 5.52	3,000	620	ND	15
B- 6	3.5 - 4.5	11.72	8.22 - 7.22	2,500	745	ND	50
B- 6	6.0 - 6.5		5.72 - 5.22	1,600	440	ND	360
B- 7	7.0 - 7.5	12.01	5.01 - 4.51	50	27	ND	4
B- 7	8.5 - 9.5		3.51 - 2.51	20	24	ND	580
B- 8	3.0 - 4.0	9.90	6.9 - 5.90	700	23	ND	15,000
B- 8	7.0 - 8.0		2.9 - 1.90	20	14	ND	1,000
B- 9	2.5 - 3.0	8.73	6.23 - 5.73	20	39	ND	ND
B- 9	7.0 - 7.5		1.73 - 1.23	20	24	ND	47
B-10	4.0 - 4.5	10.48	6.48 - 5.98	20	32	ND	3
B-10	5.5 - 6.5		4.98 - 3.98	ND	9	ND	ND
B-11	2.5 - 3.0	5.64	3.14 - 2.64	210	65	ND	400

Notes:

1. The TTLC and 10 x STLC values for lead are 1,000 mg/kg and 50 mg/kg, respectively.
2. The TTLC and 10 x STLC values for copper are 2,500 mg/kg and 250 mg/kg, respectively.
3. NA - not analyzed; ND - not detected, see laboratory results for reporting limits.
4. Borings B-1 through B-11 drilled and sampled by Gregg Drilling under the direction of Treadwell & Rollo, Inc. on 20 and 21 August 1992.

TABLE 2
SUMMARY OF PREVIOUS ANALYTICAL RESULTS
INDUSTRIAL WAY PROPERTIES
Brisbane, California

Sample Number:	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (mg/kg)	TPH Gasoline (mg/kg)	Total Lead (mg/kg)	Total Copper (mg/kg)
SB - 2 - 13	ND	ND	ND	ND	ND	4,100	910
SB - 4 - 13	ND	ND	ND	ND	ND	5,400	670
SB - 5 - 12	0.4	ND	ND	ND	33	6,700	5,200
SB - 5 - 14.5	ND	ND	ND	ND	ND	110	32
SB - 6 - 12.5	ND	ND	ND	ND	ND	3,700	1,100
SB - 7 - 10.5	0.5	ND	ND	ND	20	4,100	330
SB - 8 - 13/MW-1	0.3	ND	ND	ND	2	19,000	650

Note: SB-Series samples obtained by Geomatrix Consultants, Inc. on 25 and 26 November 1991; sample results for hydrocarbon and lead analyses were reported in December 1991; copper results were reported in January 1992.

APPENDIX A

Boring Logs
B-1 through B-11

PROJECT: **INDUSTRIAL WAY PROPERTIES**
Brisbane, California

Log of Boring B-1

Boring location: See Figure 2

Date started: 8/20/92 | Date finished: 8/20/92

Drilling method: Hollow-Stem Auger, 6-inch diameter

Hammer weight: N/A | Drop: N/A

Sampler: Continuous Core

NOTES: Logged by Kevin Kramer

DEPTH (Feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/foot	LITHOLOGY	MATERIAL DESCRIPTION	Analytical Results: TPH Diesel (mg/kg)	Analytical Results: Bunker "C" Oil (mg/kg)	Analytical Results: Lead (mg/kg)	Analytical Results: Copper (mg/kg)
					Ground Surface Elevation: 19.88 feet				
					4-inch asphalt				
1–2	1			CL	SANDY CLAY (CL) mottled brown, medium stiff, moist	NA	NA	NA	NA
3–4	2			CL	grades with olive-gray, more sand (slight odor)	23	< 25	30	29
5–6				CL	trace organics FILL				
7–8	3			CL	grades with gravels wood fragments 7 to 8 feet	5	< 25	140	50
9–10	4			CL					
11–12	5			CL	SILTY CLAY (CL) yellow-brown mottled with trace gray, red and brown, medium stiff, moist	< 1	< 25	20	13
13–14				CL					
15–16				CL					
17–18	6			CL	grades with sand and gravel, very stiff	NA	NA	NA	NA
19–20					Boring terminated at 19 feet and backfilled with bentonite-cement grout.				
21–22									
23–24									
25–26									
27–28									
29–30									

PROJECT: **INDUSTRIAL WAY PROPERTIES**
Brisbane, California

Log of Boring B-2

Boring location: See Figure 2

Date started: 8/20/92 | Date finished: 8/20/92

Drilling method: Hollow-Stem Auger, 6-inch diameter

Hammer weight: N/A | Drop: N/A

Sampler: Continuous Core

NOTES: Logged by Kevin Kramer

DEPTH (Feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/foot	LITHOLOGY	MATERIAL DESCRIPTION	Analytical Results: TPH Diesel (mg/kg)	Analytical Results: Bunker "C" Oil (mg/kg)	Analytical Results: Lead (mg/kg)	Analytical Results: Copper (mg/kg)
					Ground Surface Elevation: 19.14 feet				
0					2-inch asphalt				
1					SANDY CLAY (CL)				
2					mottled brown, medium stiff, moist, trace gravels				
3					color change to brown-gray				
4	1				slight sheen 3 to 4-1/2 feet, no odor	290	< 250	160	110
5									
6				CL	grades with more sand				
7					FILL				
8						< 1	< 25	20	13
9	2				grades with gravels				
10									
11	3				brick fragments at 10-1/2 feet				
12					wet	NA	NA	NA	NA
13				GW	SANDY GRAVEL WITH CLAY (GW), brown and yellow-brown, dense, [highly weathered bedrock]				
14					Boring terminated at 13 feet and backfilled with bentonite-cement grout.				
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									
25									
26									
27									
28									
29									
30									

PROJECT: **INDUSTRIAL WAY PROPERTIES**
Brisbane, California

Log of Boring B-3

Boring location: See Figure 2

Date started: 8/20/92 | Date finished: 8/20/92

Drilling method: Hollow-Stem Auger, 6-inch diameter

Hammer weight: N/A | Drop: N/A

Sampler: Continuous Core

NOTES: Logged by Kevin Kramer

DEPTH (Feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/foot	LITHOLOGY	MATERIAL DESCRIPTION	TPH Diesel (mg/kg)	Analytical Results: Bunker "C" Oil (mg/kg)	Analytical Results: Lead (mg/kg)	Analytical Results: Copper (mg/kg)
					Ground Surface Elevation: 17.09 feet				
0					2-inch asphalt				
1–4	1			SW	SAND WITH CLAY (SW) brown-gray, dry to moist, with varying amounts of rubble	8	< 25	NA	77
5–8	2			SW	color change to dark gray	62	< 25	NA	1,300
9–12	3			SW					
13–14				SW	color change to brown-gray wet	7	< 25	NA	1,100
15	4			SW					
15–19				CH	CLAY (CH) olive-gray, soft to medium stiff	NA	NA	NA	NA
20–30					Boring terminated at 19.5 feet and backfilled with a bentonite-cement grout.				

FILL

BAY MUD

PROJECT: **INDUSTRIAL WAY PROPERTIES**
Brisbane, California

Log of Boring B-4

Boring location: See Figure 2

Date started: 8/20/92 | Date finished: 8/20/92

Drilling method: Hollow-Stem Auger, 6-inch diameter

Hammer weight: N/A | Drop: N/A

Sampler: Continuous Core

NOTES: Logged by Kevin Kramer

DEPTH (Feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/foot	LITHOLOGY	MATERIAL DESCRIPTION	Analytical Results: TPH Diesel (mg/kg)	Analytical Results: Bunker "C" Oil (mg/kg)	Analytical Results: Lead (mg/kg)	Analytical Results: Copper (mg/kg)
					Ground Surface Elevation: 17.93 feet				
					3-inch asphalt				
1–2				CL	SANDY CLAY (CL) olive, medium stiff, moist — FILL				
3–4	1			CL	SILTY CLAY (CL) yellow-brown, mottled with trace gray and brown, medium stiff, moist	< 1	< 25	20	19
5					grades stiff				
6–7					grades very stiff grades with gravel				
8	2					< 1	< 25	20	20
9				CL	GRAVELLY CLAY/CLAYEY GRAVEL, yellow-brown				
10					Boring terminated at 9.5 feet and backfilled with bentonite-cement grout.				
11–30									

PROJECT: **INDUSTRIAL WAY PROPERTIES**
Brisbane, California

Log of Boring B-5

Boring location: See Figure 2

Date started: 8/20/92 | Date finished: 8/20/92

NOTES: Logged by Kevin Kramer

Drilling method: Hollow-Stem Auger, 6-inch diameter

Hammer weight: N/A | Drop: N/A

Sampler: Continuous Core

DEPTH (Feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/foot	LITHOLOGY	MATERIAL DESCRIPTION	TPH Diesel (mg/kg)	Analytical Results: Bunker "C" Oil (mg/kg)	Analytical Results: Lead (mg/kg)	Analytical Results: Copper (mg/kg)
					Ground Surface Elevation: 14.52 feet				
					3-inch asphalt				
1					6-inch gravelly sand (base rock)				
2					SILTY CLAY				
3					mottled brown, medium stiff, moist, with trace sand and gravel				
4									
5	1				trace black oily substance with petroleum hydrocarbon odor	7	< 25	30	26
6				CL					
7					brick and cobble fragments				
8	2				no odor	15	< 25	3,000	620
9					FILL				
10	3				CLAY (CH)	NA	NA	NA	NA
11				CH	olive-gray, medium stiff, moist				
12					BAY MUD				
13					Boring terminated at 13 feet and backfilled with bentonite-cement grout.				
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									
25									
26									
27									
28									
29									
30									

PROJECT: **INDUSTRIAL WAY PROPERTIES**
Brisbane, California

Log of Boring B-6

Boring location: See Figure 2

Date started: 8/20/92 | Date finished: 8/21/92

Drilling method: Hollow-Stem Auger, 6-inch diameter

Hammer weight: N/A | Drop: N/A

Sampler: Continuous Core

NOTES: Logged by Kevin Kramer

DEPTH (Feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/foot	LITHOLOGY	MATERIAL DESCRIPTION		Analytical Results: TPH Diesel (mg/kg)	Analytical Results: Bunker "C" Oil (mg/kg)	Analytical Results: Lead (mg/kg)	Analytical Results: Copper (mg/kg)
					Ground Surface Elevation: 11.72 feet					
1					3-inch asphalt 8-inch gravelly sand (base rock) Concrete slab 1 to 3 feet with reinforcing steel					
2										
3										
4	1			SC	CLAYEY SAND WITH GRAVEL (SC) light brown, dry		50	< 250	2,500	745
5					color change to brown and red-brown, moist	FILL				
6	2				grades with more gravel		360	< 250	1,600	440
7	3				black oily substance from 6.5 feet, slight odor wet at 6.5 feet		NA	NA	NA	NA
8					CLAY (CH) olive-gray, medium stiff					
9										
10						BAY MUD				
11				CH						
12										
13	4						NA	NA	NA	NA
14										
15					Boring terminated at 14.5 feet and backfilled with bentonite-cement grout.					
16										
17										
18										
19										
20										
21										
22										
23										
24										
25										
26										
27										
28										
29										
30										

PROJECT: **INDUSTRIAL WAY PROPERTIES**
Brisbane, California

Log of Boring B-7

Boring location: See Figure 2

Date started: 8/20/92 | Date finished: 8/20/92

Drilling method: Hollow-Stem Auger, 6-inch diameter

Hammer weight: N/A | Drop: N/A

Sampler: Continuous Core

NOTES: Logged by Kevin Kramer

DEPTH (Feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/foot	LITHOLOGY	MATERIAL DESCRIPTION	TPH Diesel (mg/kg)	Analytical Results: Bunker "C" Oil (mg/kg)	Analytical Results: Lead (mg/kg)	Analytical Results: Copper (mg/kg)
					Ground Surface Elevation: 12.01 feet				
0					3-inch asphalt				
1	1			SC	CLAYEY SAND (SC) FILL brown, loose, moist	NA	NA	NA	NA
2									
3					concrete slab 2 to 3 feet				
4				CL	SANDY CLAY WITH GRAVEL (CL) mottled olive, brown, and red-yellow, medium stiff, moist				
5									
6									
7	2					4	< 25	50	27
8									
9	3					580	< 250	20	24
10				CH	CLAY (CH) olive-gray, moist, trace wood fragments, dark oily sheen with petroleum hydrocarbon odor at contact BAY MUD				
11									
12					Boring terminated at 12 feet and backfilled with bentonite-cement grout.				
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									
25									
26									
27									
28									
29									
30									

PROJECT: **INDUSTRIAL WAY PROPERTIES**
Brisbane, California

Log of Boring B-8

Boring location: See Figure 2

Date started: 8/20/92 | Date finished: 8/20/92

Drilling method: Hollow-Stem Auger, 6-inch diameter

Hammer weight: N/A | Drop: N/A

Sampler: Continuous Core

NOTES: Logged by Kevin Kramer

DEPTH (Feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/foot	LITHOLOGY	MATERIAL DESCRIPTION	TPH Diesel (mg/kg)	Analytical Results: Bunker "C" Oil (mg/kg)	Analytical Results: Lead (mg/kg)	Analytical Results: Copper (mg/kg)
					Ground Surface Elevation: 9.90 feet				
0					3-inch asphalt				
1–3				CL	SANDY CLAY (CL) brown, medium stiff, moist, trace gravel				
3	1					15,000	< 2,500	700	23
4–7				SC	CLAYEY SAND WITH GRAVEL (SC) dark gray, moist, with oily sheen and odor FILL				
7	2								
8						1,000	< 250	20	14
8–9	3					NA	NA	NA	NA
9–12				CH	CLAY (CH) dark olive-gray, wet, slight odor bone fragment at 9.5 feet BAY MUD				
12					Boring terminated at 12 feet and backfilled with bentonite-cement grout.				
13–30									

PROJECT: **INDUSTRIAL WAY PROPERTIES**
Brisbane, California

Log of Boring B-9

Boring location: See Figure 2

Date started: 8/21/92 | Date finished: 8/21/92

Drilling method: Hollow-Stem Auger, 6-inch diameter

Hammer weight: N/A | Drop: N/A

Sampler: Continuous Core

NOTES: Logged by Kevin Kramer

DEPTH (Feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/foot	LITHOLOGY	MATERIAL DESCRIPTION		Analytical Results: TPH Diesel (mg/kg)	Analytical Results: Bunker "C" Oil (mg/kg)	Analytical Results: Lead (mg/kg)	Analytical Results: Copper (mg/kg)
					Ground Surface Elevation: 8.73 feet					
					4-inch asphalt					
1–2	1			SW	GRAVELLY SAND WITH CLAY (SW) brown, medium dense, dry to moist	FILL				
3–6				CL	SANDY CLAY WITH GRAVEL (CL) yellow-brown, medium stiff, moist		< 1	< 25	20	39
7	2						47	< 25	20	24
8				SC	CLAYEY SAND (SC), olive-gray, wet					
9–11	3			CH	CLAY (CH) olive-gray, wet	BAY MUD	NA	NA	NA	NA
12					Boring terminated at 11 feet and backfilled with bentonite-cement grout.					

TREADWELL & ROLLO, INC.
Consulting Engineers and Scientists

Project No. 1373A

Figure A-9

PROJECT: **INDUSTRIAL WAY PROPERTIES**
Brisbane, California

Log of Boring B-10

Boring location: See Figure 2

Date started: 8/21/92 | Date finished: 8/21/92

Drilling method: Hollow-Stem Auger, 6-inch diameter

Hammer weight: N/A | Drop: N/A

Sampler: Continuous Core

NOTES: Logged by Kevin Kramer

DEPTH (Feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/foot	LITHOLOGY	MATERIAL DESCRIPTION	Analytical Results: TPH Diesel (mg/kg)	Analytical Results: Bunker "C" Oil (mg/kg)	Analytical Results: Lead (mg/kg)	Analytical Results: Copper (mg/kg)
					Ground Surface Elevation: 10.48 feet				
0					3-inch asphalt				
1–2	1			SC	CLAYEY SAND WITH GRAVEL (SC) yellow-brown, medium dense, dry to moist	NA	NA	NA	NA
2–3					concrete slab 2 to 3 feet				
3–4	2			SC	color change to gray and yellow-brown — FILL	3	< 25	20	32
5–6	3			CL	SANDY CLAY (CL) yellow-brown, medium stiff, moist	< 1	< 25	< 3	9
8–9	4			SC	CLAYEY SAND (SC) olive-gray, medium stiff, wet	NA	NA	NA	NA
10–11	5			MH	CLAYEY SILT (MH) dark olive-gray, soft	NA	NA	NA	NA
11–12				CH	CLAY (CH) blue-olive, medium stiff — BAY MUD				
14–15					Boring terminated at 14 feet and backfilled with bentonite-cement grout.				

PROJECT: **INDUSTRIAL WAY PROPERTIES**
Brisbane, California

Log of Boring B-11

Boring location: See Figure 2

Date started: 8/21/92 | Date finished: 8/21/92

Drilling method: Hollow-Stem Auger, 6-inch diameter

Hammer weight: N/A | Drop: N/A

Sampler: Continuous Core

NOTES: Logged by Kevin Kramer

DEPTH (Feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/foot	LITHOLOGY	MATERIAL DESCRIPTION	Analytical Results: TPH Diesel (mg/kg)	Analytical Results: Bunker "C" Oil (mg/kg)	Analytical Results: Lead (mg/kg)	Analytical Results: Copper (mg/kg)
					Ground Surface Elevation: 5.64 feet				
					XX-inch asphalt				
1–3	1			SC	CLAYEY SAND WITH GRAVEL (SC) brown, medium dense, moist, varying amount cobbles and rubble color change to dark gray with dark oily sheen and odor moist to wet FILL	400	< 250	210	65
4–5	2			SW	GRAVELLY SAND WITH CLAY (SW) olive-gray, medium dense, wet	NA	NA	NA	NA
6–9	3			CH	CLAY (CH) olive-gray, soft to medium stiff at seven feet BAY MUD	NA	NA	NA	NA
10					Boring terminated at 9.5 feet and backfilled with bentonite-cement grout.				

Unified Soil Classification System

Major Divisions		Symbols	Typical Names
Coarse-Grained Soils (more than half of soil > no. 200 sieve size)	Gravels (More than half of coarse fraction > no. 4 sieve size)	GW	Well-graded gravels or gravel-sand mixtures, little or no fines
		GP	Poorly-graded gravels or gravel-sand mixtures, little or no fines
		GM	Silty gravels, gravel-sand-silt mixtures
		GC	Clayey gravels, gravel-sand-clay mixtures
	Sands (More than half of coarse fraction < no. 4 sieve size)	SW	Well-graded sands or gravelly sands, little or no fines
		SP	Poorly-graded sands or gravelly sands, little or no fines
		SM	Silty sands, sand-silt mixtures
		SC	Clayey sands, sand-clay mixtures
Fine -Grained Soils (more than half of soil < no. 200 sieve size)	Silts and Clays LL = < 50	ML	Inorganic silts and very fine sands, rock flour, silty fine sands or clayey silts with slight plasticity
		CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, lean clays
		OL	Organic silts and organic silty clays of low plasticity
	Silts and Clays LL = > 50	MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts
		CH	Inorganic clays of high plasticity, fat clays
		OH	Organic clays of high plasticity, organic silty clays, organic silts
Highly Organic Soils		Pt	Peat and other highly organic soils

Grain Size Chart

Classification	Range of Grain Sizes	
	U.S. Standard Sieve Size	Grain Size in Millimeters
Boulders	Above 12"	Above 305
Cobbles	12" to 3"	305 to 76.2
Gravel	3" to No. 4	76.2 to 4.76
coarse	3" to 3/4"	76.2 to 19.1
fine	3/4" to No. 4	19.1 to 4.76
Sand	No. 4 to No. 200	4.76 to 0.074
coarse	No. 4 to No. 10	4.76 to 2.00
medium	No. 10 to No. 40	2.00 to 0.420
fine	No. 40 to No. 200	0.420 to 0.074
Silt and Clay	Below No. 200	Below 0.074

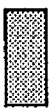
Sample Designation



Denotes the groundwater level encountered during drilling at the depth shown on the well logs.



Denotes the stabilized groundwater level at the date and depth shown on the well logs.



Denotes a continuous core sample interval.



Denotes retrieved from a continuous core for chemical analysis or storage.

FORMER CHEVRON STATION
Cholame, California

CLASSIFICATION CHART

TREADWELL & ROLLO, INC.
Consulting Engineers and Scientists

Project No. 1373A | Figure A-12

APPENDIX B

Laboratory Analytical Results

Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878
2323 Fifth Street, Berkeley, CA 94710, Phone (510) 486-0900

DATE RECEIVED: 08/21/92
DATE REPORTED: 09/04/92

LABORATORY NUMBER: 108376

CLIENT: TREADWELL & ROLLO, INC.

PROJECT ID: 1373A

LOCATION: INDUSTRIAL PROPERTIES

RECEIVED
SEP 0 9 1992
TREADWELL & ROLLO

RESULTS: SEE ATTACHED

Reviewed by

Reviewed by

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 108376
CLIENT: TREADWELL & ROLLO, INC.
PROJECT ID: 1373A
LOCATION: INDUSTRIAL PROPERTIES

DATE SAMPLED: 08/20/92
DATE RECEIVED: 08/21/92
DATE EXTRACTED: 08/25/92
DATE ANALYZED: 08/27/92
DATE REPORTED: 09/03/92
DATE REVISED: 09/08/92

Extractable Petroleum Hydrocarbons in Soils & Wastes
California DOHS Method
LUFT Manual October 1989

LAB ID	SAMPLE ID	BUNKER C OIL (mg/Kg)	REPORTING LIMIT (mg/Kg)
108376-2	B-7 NO2	ND	25
108376-3	B-7 NO3	ND	250

ND = Not Detected at or above reporting limit.

RECEIVED
SEP 11 1992
TREADWELL & ROLLO

QA/QC SUMMARY

RPD, %	5
RECOVERY, %	80

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 108376
CLIENT: TREADWELL & ROLLO, INC.
PROJECT ID: 1373A
LOCATION: INDUSTRIAL PROPERTIES

DATE SAMPLED: 08/20/92
DATE RECEIVED: 08/21/92
DATE EXTRACTED: 08/25/92
DATE ANALYZED: 08/27/92
DATE REPORTED: 09/03/92
DATE REVISED: 09/08/92

Extractable Petroleum Hydrocarbons in Soils & Wastes
California DOHS Method
LUFT Manual October 1989

LAB ID	SAMPLE ID	BUNKER C OIL (mg/Kg)	REPORTING LIMIT (mg/Kg)
108376-4	B-5 NO1	ND	25
108376-5	B-5 NO2	ND	25
108376-7	B-2 NO1	ND	250
108376-8	B-2 NO2	ND	25
108376-11	B-1 NO2	ND	25
108376-12	B-1 NO3	ND	25
108376-13	B-1 NO4	ND	25
108376-16	B-3 NO1	ND	25
108376-17	B-3 NO2	ND	25
108376-18	B-3 NO3	ND	25
108376-21	B-4 NO2	ND	25
108376-22	B-4 NO3	ND	25
108376-23	B-8 NO1	ND	2,500

ND = Not Detected at or above reporting limit.

RECEIVED
SEP 1 1 1992
TREADWELL & ROLLO

QA/QC SUMMARY

RPD, %	9
RECOVERY, %	93

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 108376
CLIENT: TREADWELL & ROLLO, INC.
PROJECT ID: 1373A
LOCATION: INDUSTRIAL PROPERTIES

DATE SAMPLED: 08/20-21/9
DATE RECEIVED: 08/21/92
DATE EXTRACTED: 08/25/92
DATE ANALYZED: 08/27/92
DATE REPORTED: 09/03/92
DATE REVISED: 09/08/92

Extractable Petroleum Hydrocarbons in Soils & Wastes
California DOHS Method
LUFT Manual October 1989

LAB ID	SAMPLE ID	BUNKER C OIL (mg/Kg)	REPORTING LIMIT (mg/Kg)
108376-24	B-8 NO2	ND	250
108376-26	B-6 NO1	ND	250
108376-27	B-6 NO2	ND	250
108376-30	B-9 NO1	ND	25
108376-31	B-9 NO2	ND	25
108376-33	B-11 NO1	ND	250
108376-37	B-10 NO2	ND	25

ND = Not Detected at or above reporting limit.

RECEIVED
SEP 11 1992
TREADWELL & ROLLO

QA/QC SUMMARY

RPD, %	9
RECOVERY, %	93

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 108376
CLIENT: TREADWELL & ROLLO, INC.
PROJECT ID: 1373A
LOCATION: INDUSTRIAL PROPERTIES

DATE SAMPLED: 08/21/92
DATE RECEIVED: 08/21/92
DATE EXTRACTED: 08/25/92
DATE ANALYZED: 08/27/92
DATE REPORTED: 09/03/92
DATE REVISED: 09/08/92

Extractable Petroleum Hydrocarbons in Soils & Wastes
California DOHS Method
LUFT Manual October 1989

LAB ID	SAMPLE ID	BUNKER C OIL (mg/Kg)	REPORTING LIMIT (mg/Kg)
108376-38	B-10 NO3	ND	25

ND = Not Detected at or above reporting limit.

RECEIVED
SEP 1 1 1992
TREADWELL & ROLLO

QA/QC SUMMARY: LABORATORY CONTROL SAMPLE

RECOVERY, %	65

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 108376
CLIENT: TREADWELL & ROLLO, INC.
PROJECT: 1373A
LOCATION: INDUSTRIAL PROPERTIES

DATE SAMPLED: 08/20-21/92
DATE RECEIVED: 08/21/92
DATE ANALYZED: 08/26/92
DATE REPORTED: 09/03/92

ANALYSIS: LEAD
ANALYSIS METHOD: EPA 6010

LAB ID	SAMPLE ID	RESULT	UNITS	REPORTING LIMIT
108376-2	B-7 NO2	50	mg/Kg	10
108376-3	B-7 NO3	20	mg/Kg	10
108376-4	B-5 NO1	30	mg/Kg	10
108376-5	B-5 NO2	3,000	mg/Kg	10
108376-7	B-2 NO1	160	mg/Kg	10
108376-8	B-2 NO2	20	mg/Kg	10
108376-11	B-1 NO2	30	mg/Kg	10
108376-12	B-1 NO3	140	mg/Kg	10
108376-13	B-1 NO4	20	mg/Kg	10
108376-21	B-4 NO2	20	mg/Kg	10
108376-22	B-4 NO3	20	mg/Kg	10
108376-23	B-8 NO1	700	mg/Kg	100
108376-24	B-8 NO2	20	mg/Kg	10
108376-26	B-6 NO1	2,500	mg/Kg	10

QA/QC SUMMARY:

RPD, %	2
RECOVERY, %	96

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 108376
CLIENT: TREADWELL & ROLLO, INC.
PROJECT: 1373A
LOCATION: INDUSTRIAL PROPERTIES

DATE SAMPLED: 08/21/92
DATE RECEIVED: 08/21/92
DATE ANALYZED: 08/31/92
DATE REPORTED: 09/03/92

ANALYSIS: LEAD
ANALYSIS METHOD: EPA 6010

LAB ID	SAMPLE ID	RESULT	UNITS	REPORTING LIMIT
108376-27	B-6 NO2	1,600	mg/Kg	10
108376-30	B-9 NO1	20	mg/Kg	10
108376-31	B-9 NO2	20	mg/Kg	10
108376-33	B-11 NO1	210	mg/Kg	10
108376-37	B-10 NO2	20	mg/Kg	10

QA/QC SUMMARY:

RPD, %	2
RECOVERY, %	80

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 108376
CLIENT: TREADWELL & ROLLO, INC.
PROJECT: 1373A
LOCATION: INDUSTRIAL PROPERTIES

DATE SAMPLED: 08/21/92
DATE RECEIVED: 08/21/92
DATE ANALYZED: 09/02/92
DATE REPORTED: 09/03/92

ANALYSIS: LEAD
ANALYSIS METHOD: EPA 7420

LAB ID	SAMPLE ID	RESULT	UNITS	REPORTING LIMIT
108376-38	B-10 NO3	ND	mg/Kg	3

ND = Not detected at or above reporting limit.

QA/QC SUMMARY:

RPD, %	<1
RECOVERY, %	94

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 108376
CLIENT: TREADWELL & ROLLO, INC.
PROJECT: 1373A
LOCATION: INDUSTRIAL PROPERTIES

DATE SAMPLED: 08/20-21/92
DATE RECEIVED: 08/21/92
DATE ANALYZED: 08/26/92
DATE REPORTED: 09/03/92

ANALYSIS: COPPER
ANALYSIS METHOD: EPA 6010

LAB ID	SAMPLE ID	RESULT	UNITS	REPORTING LIMIT
108376-2	B-7 NO2	27	mg/Kg	0.5
108376-3	B-7 NO3	24	mg/Kg	0.5
108376-4	B-5 NO1	26	mg/Kg	0.5
108376-5	B-5 NO2	620	mg/Kg	0.5
108376-7	B-2 NO1	110	mg/Kg	0.5
108376-8	B-2 NO2	13	mg/Kg	0.5
108376-11	B-1 NO2	29	mg/Kg	0.5
108376-12	B-1 NO3	50	mg/Kg	0.5
108376-13	B-1 NO4	13	mg/Kg	0.5
108376-16	B-3 NO1	77	mg/Kg	0.5
108376-17	B-3 NO2	1,300	mg/Kg	0.5
108376-18	B-3 NO3	1,100	mg/Kg	0.5
108376-21	B-4 NO2	19	mg/Kg	0.5
108376-22	B-4 NO3	20	mg/Kg	0.5
108376-23	B-8 NO1	23	mg/Kg	5
108376-24	B-8 NO2	14	mg/Kg	0.5
108376-26	B-6 NO1	745	mg/Kg	0.5

QA/QC SUMMARY:

RPD, %	<1
RECOVERY, %	90

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 108376
CLIENT: TREADWELL & ROLLO, INC.
PROJECT: 1373A
LOCATION: INDUSTRIAL PROPERTIES

DATE SAMPLED: 08/21/92
DATE RECEIVED: 08/21/92
DATE ANALYZED: 08/31/92
DATE REPORTED: 09/04/92

ANALYSIS: COPPER
ANALYSIS METHOD: EPA 6010

LAB ID	SAMPLE ID	RESULT	UNITS	REPORTING LIMIT
108376-27	B-6 NO2	440	mg/Kg	0.5
108376-30	B-9 NO1	39	mg/Kg	0.5
108376-31	B-9 NO2	24	mg/Kg	0.5
108376-33	B-11 NO1	65	mg/Kg	0.5
108376-37	B-10 NO2	32	mg/Kg	0.5
108376-38	B-10 NO3	9	mg/Kg	0.5

QA/QC SUMMARY:

RPD, %	<1
RECOVERY, %	89

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 108376
CLIENT: TREADWELL & ROLLO, INC.
PROJECT ID: 1373A
LOCATION: INDUSTRIAL PROPERTIES

DATE SAMPLED: 08/20/92
DATE RECEIVED: 08/21/92
DATE EXTRACTED: 08/25/92
DATE ANALYZED: 08/27/92
DATE REPORTED: 09/03/92

Extractable Petroleum Hydrocarbons in Soils & Wastes
California DOHS Method
LUFT Manual October 1989

LAB ID	SAMPLE ID	KEROSENE RANGE (mg/Kg)	DIESEL RANGE (mg/Kg)	REPORTING LIMIT* (mg/Kg)
108376-2	B-7 NO2	ND	4	1
108376-3	B-7 NO3	**	580	10

ND = Not Detected at or above reporting limit.

* Reporting limit applies to all analytes.

** Quantiated as diesel range.

QA/QC SUMMARY

RPD, %	5
RECOVERY, %	80

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 108376
CLIENT: TREADWELL & ROLLO, INC.
PROJECT ID: 1373A
LOCATION: INDUSTRIAL PROPERTIES

DATE SAMPLED: 08/20/92
DATE RECEIVED: 08/21/92
DATE EXTRACTED: 08/25/92
DATE ANALYZED: 08/27/92
DATE REPORTED: 09/03/92

Extractable Petroleum Hydrocarbons in Soils & Wastes
California DOHS Method
LUFT Manual October 1989

LAB ID	SAMPLE ID	KEROSENE RANGE (mg/Kg)	DIESEL RANGE (mg/Kg)	REPORTING LIMIT* (mg/Kg)
108376-4	B-5 NO1	**	7	1
108376-5	B-5 NO2	**	15	1
108376-7	B-2 NO1	**	290	10
108376-8	B-2 NO2	ND	ND	1
108376-11	B-1 NO2	**	23	1
108376-12	B-1 NO3	ND	5	1
108376-13	B-1 NO4	ND	ND	1
108376-16	B-3 NO1	**	8	1
108376-17	B-3 NO2	**	62	1
108376-18	B-3 NO3	**	7	1
108376-21	B-4 NO2	ND	ND	1
108376-22	B-4 NO3	ND	ND	1
108376-23	B-8 NO1	**	15,000	100

ND = Not Detected at or above reporting limit.

* Reporting limit applies to all analytes.

** Quantiated as diesel range.

QA/QC SUMMARY

RPD, %	9
RECOVERY, %	93

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 108376
CLIENT: TREADWELL & ROLLO, INC.
PROJECT ID: 1373A
LOCATION: INDUSTRIAL PROPERTIES

DATE SAMPLED: 08/20-21/92
DATE RECEIVED: 08/21/92
DATE EXTRACTED: 08/25/92
DATE ANALYZED: 08/27/92
DATE REPORTED: 09/03/92

Extractable Petroleum Hydrocarbons in Soils & Wastes
California DOHS Method
LUFT Manual October 1989

LAB ID	SAMPLE ID	KEROSENE RANGE (mg/Kg)	DIESEL RANGE (mg/Kg)	REPORTING LIMIT* (mg/Kg)
108376-24	B-8 NO2	**	1,000	10
108376-26	B-6 NO1	ND	50	10
108376-27	B-6 NO2	**	360	10
108376-30	B-9 NO1	ND	ND	1
108376-31	B-9 NO2	**	47	1
108376-33	B-11 NO1	**	400	10
108376-37	B-10 NO2	**	3	1

ND = Not Detected at or above reporting limit.

* Reporting limit applies to all analytes.

** Quantiated as diesel range.

QA/QC SUMMARY

RPD, %	9
RECOVERY, %	93

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 108376
CLIENT: TREADWELL & ROLLO, INC.
PROJECT ID: 1373A
LOCATION: INDUSTRIAL PROPERTIES

DATE SAMPLED: 08/21/92
DATE RECEIVED: 08/21/92
DATE EXTRACTED: 08/25/92
DATE ANALYZED: 08/27/92
DATE REPORTED: 09/03/92

Extractable Petroleum Hydrocarbons in Soils & Wastes
California DOHS Method
LUFT Manual October 1989

LAB ID	SAMPLE ID	KEROSENE RANGE (mg/Kg)	DIESEL RANGE (mg/Kg)	REPORTING LIMIT* (mg/Kg)
108376-38	B-10 NO3	ND	ND	1

ND = Not Detected at or above reporting limit.

* Reporting limit applies to all analytes.

QA/QC SUMMARY: LABORATORY CONTROL SAMPLE

RECOVERY, %	65

108376

TREADWELL & ROLLO, INC.
353 Sacramento Street, Suite 800
San Francisco, California 94111
(415) 955-9040
(415) 955-9041 Fax

CHAIN OF CUSTODY RECORD

Project #: 1373A Project Name: Date: 8-21-92 Page 2 of 2

Date	Sample Number		Analysis: Bunker C 8015	7420 lead	6010 copper			Number of Containers	Sample Information
8-20	B-8	No 1	X	X	X				23
		No 2	X	X	X				24
		No 3							25
8-21	B-6	No 1	X	X	X				26
		No 2	X	X	X				27
		No 3							28
		No 4							29
	B-3	No 1	X	X	X				30
		No 2	X	X	X				31
		No 3							32
	B-1	No 1	X	X	X				33
		No 2							34
		No 3							35
	B-2	No 1							36
		No 2	X	X	X				37
		No 3	X	X	X				38
		No 4							39
		No 5							40
		Total Number of Containers						40	

Relinquished By (Sampler):
Signature: Kevin Kramer
Printed Name: KRK
Company:
Date: 8-21-92 Time:

Received By:
Signature
Printed Name
Company:
Date: Time:

Relinquished By:
Signature
Printed Name
Company:
Date: Time:
Method of Shipment:

Received by (Lab): Curtis & Tompkins
Signature: Troy E. Windsor
Printed Name: Troy Windsor
Lab
Date: 8-21-92 Time: 1125

Lab Comments: Fax copy

REMARKS:

108376

TREADWELL & ASSOCIATES, INC.
353 Sacramento Street, Suite 800
San Francisco, California 94111
(415) 955-9040

CHAIN OF CUSTODY RECORD

Project #: 1373 A Project Name: Industrial Properties Date: 8-21-92 Page: 1 of 2

Date	Sample Number		Analysis: 8015 Bunker C	7420 lead	6010 copper				Number of Containers	Sample Information
8-20	~~B-7~~	No 1								-1
	B-7	No 2	x	x	x					-2
	B-7	No 3	x	x	x					-3
	B-5	No 1	x	x	x					-4
		No 2	x	x	x					-5
		No 3								-6
	B-2	No 1	x	x	x					-7
		No 2	x	x	x					-8
		No 3								-9
	B-1	No 1								-10
		No 2	x	x	x					-11
		No 3	x	x	x					-12
		No 4	x	x	x					-13
		No 5								-14
		No 6								-15
	B-3	No 1	x		x					-16
		No 2	x		x					-17
		No 3	x		x					-18
		No 4								-19
V	B-4	No 1								-20
		No 2	x	x	x					-21
V		No 3								-22

Relinquished By (Sampler):
Signature: Kevin Kramer
Printed Name: TRI
Company:
Date: 8-21-92 Time:

Received By:
Signature:
Printed Name:
Company:
Date: Time:

Relinquished By:
Signature:
Printed Name:
Company:
Date: Time:

Method of Shipment:

Received By (Lab):
Curtis & Tompkins
Signature: Troy E. Windsor
Printed Name: Troy Windsor
Lab:
Date: 8-21-92 Time: 1125

Lab Comments: Fax Copy

REMARKS:
Hold all samples 6 mos for possible additional testing on 8015 use Bunker C oil standards for TPH ~~extract~~

APPENDIX C

Geomatrix Boring Logs SB-1 through SB-8/MW-1

1790.07 A

Log of Boring No. SB-1

BORING LOCATION: 15' NORTH OF FORMER TANK EXCAVATION			
DATE STARTED: 25 Nov. 91	DATE FINISHED: 25 Nov 91	LOGGED BY: DDG / YP	
DRILLING METHOD: HOLLOW STEM AUGER		DRILLING EQUIPMENT: CME-75	
HAMMER WEIGHT: 140 #	DROP: 30"	DRILLING CONTRACTOR: HEW	
SAMPLER: 5' CONTINUOUS CORE, 18" MOD. CALIF. SPLIT SPOON			

DRAFT

DEPTH (feet)	SAMPLES Sample No.	Sample	Blows/Foot	MATERIAL DESCRIPTION	REMARKS
				Surface Elevation:	
0				ASPHAULT	BEGIN 8:50
1				SILT WITH GRAVEL, (ML) DARK REDDISH BROWN (5YR 3/2) MOIST, 75% SILT & CLAY, 25% MED GRAVEL, FIRM, LOW PLASTICITY.	NO ODOR
2				COLOR CHANGE TO BLACK (5Y 2.5/1), WOOD CHIPS & CONCRETE	
3				[Fill]	
4					
5					
6					
7				SILT WITH SAND, (ML) BLACK (5Y 2.5/1); MOIST, 70-80% SILT & CLAY, 15-20% FINE TO COARSE SAND, 5% FINE GRAVEL, SOFT, L.P. [illegible] CONCRETE, PIECES OF GLASS	To drafting: L.P. = Low plasticity on all logs
8				[Fill]	ORGANIC ODOR
9				↓ WET	
10				SILTY SAND, (SM) VERY DARK GREYISH BROWN (10YR 3/2), WET, 70-75% MED. SAND, 15-20% SILT, 10% FINE GRAVEL, GLASS, METAL, SLAG, [FILL] [illegible], PETROLEUM ODOR, FILL. [illegible]	ORGANIC ODOR OILY COATING?
11	SB-1	5			
12		3			
13		2			
14		12			
		7			COBBLE IN SAMPLER
		9		↓ INCREASING SAND TO 80% COARSE SAND, INCREASING GRAVEL SIZE TO MED. GRAVEL, SUB-ANGULAR TO SUBROUNDED	

FIELD LOG

F-1-88

Geomatrix Consultants	Project No.	Figure

DESC., COLOR, (#), MOIST/WET, % HIGH→LOW, FIRMNESS, PLASTICITY

1790.04 A

Log of Boring No. SB-1

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/Foot	MATERIAL DESCRIPTION	REMARKS
15	SB-1-15			SILTY CLAY (CL) DARK GREENISH GRAY (5G 4/1), MOIST, 100% CLAY AND SILT, TRACE FINE SAND, VERY SOFT, MED. PLASTICITY, TRACE MOTTLING.	DRAFT
16					
17			1 TOTAL	NO MOTTLING. grey	NO ODOR
18				B.O.B. 10:20	

FIELD LOG

F-2-88

Geomatrix Consultants | Project No. | Figure

1790.04 A

Log of Boring No. SB-2

BORING LOCATION: 30' NORTH OF FORMER TANK EXCAVATION			
DATE STARTED: 25 NOV 91	DATE FINISHED: 25 NOV 91	LOGGED BY: DDG / YP	
DRILLING METHOD: HOLLOW STEM AUGER		DRILLING EQUIPMENT: CME-75	
HAMMER WEIGHT: 140#	DROP: 40"	DRILLING CONTRACTOR: HEW	
SAMPLER: 5' CONTINUOUS CORE, 18" MOD. CALIF. SPLIT SPOON			

DRAFT

DEPTH (feet)	SAMPLES Sample No.	SAMPLES Sample	SAMPLES Blows/Foot	MATERIAL DESCRIPTION	REMARKS
				Surface Elevation:	
1				ASPHALT	
2				SILT WITH GRAVEL, (ML) DARK REDDISH BROWN (5YR 3/2), MOIST, 70% SILT & CLAY, 30% MED. GRAVEL, FIRM, L.P. ... WOOD WITH LIME & WHITE PAINT, CONCRETE, BRICK	
3				[Fill]	
4					
5					
6				SILT WITH SAND, (ML) BLACK (5YR 2.5/1), MOIST	ORGANIC ODOR
7				75% SILT & CLAY, 25% FINE SAND, SOFT, LOW P ... WOOD CHUNKS, GLASS,	
8				[Fill]	
9				SILTY SAND, (SM) DARK REDDISH BROWN (5YR 3/2), MOIST, 60% FINE SAND, 35% SILT, 5% MED. GRAVEL, WOOD CHIPS; GLASS, CERAMIC, AND METAL SLAG	SLIGHT O.Q.
10				[Fill]	
11					
12					RECOVERY POOR BECAUSE SOIL IS TOO LOOSE. THEY ARE USING A SAND CATCHER.
13	SB-2 -13			SAND WITH SILT, (SW-SM) DARK REDDISH BROWN (5YR 3/3) WET, 85-95% FINE TO MEDIUM SAND, 5-15% SILT ... SMALL PIECES OF GLASS, BRICK & CONCRETE,	
14				[Fill]	
15					

FIELD LOG

F-1-88

Geomatrix Consultants	Project No.	Figure

Log of Boring No. SB-3

BORING LOCATION: 15' South of former tank excavation			
DATE STARTED: 25 Nov 91	DATE FINISHED: 25 Nov 91	LOGGED BY: DDG / YP	
DRILLING METHOD: Hollow Stem Auger		DRILLING EQUIPMENT: CME 75	
HAMMER WEIGHT: 140#	DROP: 30"	DRILLING CONTRACTOR: HEW	
SAMPLER: 5' Cont. Core, 18" mod Calif. Split spoon			

DRAFT

DEPTH (feet)	SAMPLES Sample No.	Sample	Blows/Foot	MATERIAL DESCRIPTION	REMARKS
				Surface Elevation:	
0				ASPHALT	
1–6				SILT WITH GRAVEL, (ML) DARK REDDISH BROWN (5YR, 3/2), moist, 70–75% silt & clay, 25–30% medium gravel, firm, L.P., pieces of concrete, brick, wood [Fill]	
7–10				SILT WITH SAND, (ML) BLACK (2.5Y 2/0), moist, 90% silt & clay, 10% fine sand, very soft, L.P., wet, [Fill] metallic looming slag, glass, ceramics	↓ very strong O.O. oily coating on soil?
11			3	← oyster shell	
11			3		
12			7		
12			?		
13	SB-3 13			↓ wet	
14			1	SAND WITH SILT. (SW-SM) BLACK (2.5Y 2/0), wet, 80–85% coarse sand, 10–15% silt, 5% med. gravel glass, pieces [FILL]	↓ very strong O.O.
14			1		
15			1		

FIELD LOG

F-1-88

Geomatrix Consultants	Project No.	Figure

1790.04

Log of Boring No. SB-2

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/Foot	MATERIAL DESCRIPTION	REMARKS
15					
16	SB-2-16.5		1	SILTY CLAY, (CL) DARK GREENISH GREY (5G 4/1), MOIST 100% CLAY & SILT. TRACE FINE SAND. VERY SOFT, MED. P., N	DRAFT
17					
18				B.O.B. 11:40	

FIELD LOG

F-2-88

Geomatrix Consultants | Project No. 1790.04 | Figure

PROJECT: 1790.04 A

Log of Boring No. SB-3

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/Foot	MATERIAL DESCRIPTION	REMARKS
16	SB3 15.5		1	SILTY CLAY (CL), DARK GREENISH GREY (5G 4/1), MOIST 100% CLAY & SILT, TRACE FINE SAND, VERY SOFT, MEDIUM PLASTICITY, TRACE MOTTLING	DRAFT
17				B.O.B 12:35	

FIELD LOG

F-2-88

Geomatrix Consultants | Project No. | Figure

1790.04 A

Log of Boring No. SB-4

BORING LOCATION: 30' SOUTH OF FORMER

DATE STARTED: 26 NOV 91	DATE FINISHED: 26 NOV 91	LOGGED BY: DDG / YP
DRILLING METHOD: HOLLOW STEM AUGER		DRILLING EQUIPMENT: CME - 75
HAMMER WEIGHT: 140#	DROP: 30"	DRILLING CONTRACTOR: HEW
SAMPLER: 5' CONTINUOUS CORE, 18" MOD CALIF SPLIT SPOON		

DRAFT

Surface Elevation:

DEPTH (feet)	SAMPLES Sample No.	SAMPLES Sample	SAMPLES Blows/Foot	MATERIAL DESCRIPTION	REMARKS
0				ASPHAULT	DRAFT
1				SILT WITH GRAVEL, (ML), DARK REDDISH BROWN (5YR 3/2) MOIST, 70% SILT & CLAY, 20% SUBANGULAR COARSE GRAVEL & COBBLES, 10% FINE TO MED. SAND, LOW PLASTICITY SOFT, NO ODOR	
2					
3				[FILL]	
4					
5				SILT WITH SAND, (ML) VERY DARK GREYISH BROWN (2.5Y 3/2) MOIST, 70-80% SILT & CLAY, 20-30% FINE TO MED SAND, SOFT, LOW PLASTICITY, WOOD CHIPS, GLASS, METAL SLAG,	
6				[FILL]	
7					
8					
9					
10					
11			11		
	SB-4 11.5		9		
			6		
12			3		
			2	SILTY SAND (SM)	OILY COATING?
	SB-4 13		1	WET BROWN (10YR 2/F), MOIST, 70-80% SAND, 20-30% SILT & CLAY, GLASS, METAL, WOOD CHIPS,	
13				[FILL]	
14				EXPLORATORY CONTACT	
15					

FIELD LOG

F-1-88

Geomatrix Consultants	Project No.	Figure

Log of Boring No. SB-7

DEPTH (feet)	SAMPLES Sample No.	SAMPLES Sample	SAMPLES Blows/ Foot	MATERIAL DESCRIPTION	REMARKS
16	SB-7-16			SAND WITH SILT (SW-SM), BLACK (5Y 2.5/1), WET 85-90% FINE TO MED. SAND, 10-15% SILT & CLAY, [illegible] OILY COATING	OILY COATING
17			1	SILTY CLAY (CL) DARK GREENISH GRAY (5G 4/1), MOIST, 100% CLAY & SILT, TRACE FINE SAND, MED. PLASTICITY, VERY SOFT [illegible]	DRAFT
18				B.O.B. 8:50	

FIELD LOG

F-2-88

Geomatrix Consultants	Project No.	Figure

PROJECT: 1790.04

Log of Boring No. SB-5

BORING LOCATION: 14' EAST OF FORMER TANK LOCATION

DATE STARTED: 25 NOV. 91 | DATE FINISHED: 25 NOV. 91 | LOGGED BY: DDG / YP

DRILLING METHOD: HOLLOW STEM AUGER | DRILLING EQUIPMENT: CME - 75

HAMMER WEIGHT: 140 | DROP: 30" | DRILLING CONTRACTOR: HEW

SAMPLER: 5' CONTINUOUS CORE, 18" MOD. CALIF. SPLIT SPOON

DRAFT

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/Foot	MATERIAL DESCRIPTION (Surface Elevation:)	REMARKS
0				ASPHALT	
1				SILT WITH GRAVEL (ML), DARK REDDISH BROWN (5YR 3/4) MOIST, 60-70% silt + clay ~~FINES~~, 10-20% FINE TO MED. SAND, VERY SOFT, LOW PLASTICITY,	ORGANIC ODOR
2					
3				[FILL]	
4					
5					
6					
7					
8					
9				SILT WITH SAND, (ML) BLACK (2.5Y 2/0), MOIST, 70% SILT, 30% FINE TO COARSE SAND, VERY SOFT, LOW PLASTICITY,	ORGANIC ODOR. OILY COATING?
10				Pieces of wood, metal slag, glass	
11			5	[Fill]	
12	SB-5 -12		4		
13			2	SAND WITH SILT (SW-SM) BLACK (2.5Y 2/0), WET 60% FINE TO COARSE SAND, 30% FINE TO MED. GRAVEL, 10% silt + clay ~~FINES~~, GLASS, METAL, WOOD, [illegible] LIQUID, [illegible] [FILL]	VERY STRONG O.O. OILY COATING?
14	SB-5 14.5		4	SILTY CLAY (CL) DARK GREENISH GREY (5YR 3/2), MOIST 100% CLAY & SILT, TRACE SAND, VERY SOFT, MEDIUM PLASTICITY	Bag sample collected
15			3	SOME MOTTLING.	

FIELD LOG

F-1-88

Geomatrix Consultants | Project No. 1790.04 | Figure

15.5

B.O.B 15.5' 14:05

1790.04 A

Log of Boring No. SB-6

BORING LOCATION: 30' EAST OF FORMER TANK LOCATION			
DATE STARTED: 26 Nov. 91	DATE FINISHED: 26 Nov. 91	LOGGED BY: DDG	
DRILLING METHOD: Hollow Stem Auger		DRILLING EQUIPMENT: CME-75	
HAMMER WEIGHT: 140#	DROP: 30"	DRILLING CONTRACTOR: HEW	
SAMPLER: 5' Continuous Core, 18' mod. CA. split spoon			

DRAFT

DEPTH (feet)	SAMPLES Sample No.	Sample	Blows/Foot	MATERIAL DESCRIPTION	REMARKS
				Surface Elevation:	
0				ASPHAULT	BEGIN 17:00
1				SILT WITH GRAVEL (ML) DARK REDDISH BROWN (5YR 3/2), MOIST, 70-80% SILT AND CLAY, 15-25% MED. TO COARSE GRAVEL, 5% FINE TO MED. SAND, LOW PLASTICITY, (SOFT), BRICK, CONCRETE, GLASS	
2				[FILL]	
3					
4				COLOR CHANGE TO VERY DARK GREY (7.5YR 3/0)	ORGANIC ODOR (0.
5					VERY STRONG 0.0
6				[FILL]	
7					
8				[illegible] CLAY	VERY STRONG 0.0.
9				SILT, SAND (SM) DARK REDDISH BROWN (5YR 2.5/2), MOIST, 60-70% FINE TO MED SAND, 30-40% SILT AND CLAY, GLASS, METAL SLAG & WIRE, CERAMICS, BRICK	
10				[FILL]	
11	SB-6 11.5		7		
			7		
			11	SAND WITH SILT (SW-SM) DARK REDDISH BROWN (5YR 3/2), MOIST, 85-90% FINE TO COARSE SAND, 10-15% SILT, GLASS, BRICK, CERAMICS,	SLIGHT 0.0.
12			2		
	SB-6 12.5		2		
13			2	WET, [illegible]	OILY COATING?
			5		
14			9	[FILL]	
			7		
15	SB-6 14.5			SILTY CLAY (CL) DARK GREENISH GREY (5G 4/1), MOIST, 100% CLAY AND SILT, TRACE FINE SAND, MED PLASTICITY, (SOFT), TRACE	

FIELD LOG

F-1-88

Geomatrix Consultants	Project No.	Figure

1790.04

Log of Boring No. SB-6

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/Foot	MATERIAL DESCRIPTION	REMARKS
			1	BLACK / BLUE MOTTLING	DRAFT
16				B.O.B. 16'	

FIELD LOG

F-2-88

Geomatrix Consultants	Project No.	Figure

PROJECT:		Log of Well No. SB-7	
BORING LOCATION		ELEVATION AND DATUM	
DRILLING CONTRACTOR		DATE STARTED	DATE FINISHED
DRILLING METHOD		TOTAL DEPTH	SCREEN INTERVAL
DRILLING EQUIPMENT		DEPTH TO WATER ATD	CASING
SAMPLING METHOD		LOGGED BY	
HAMMER WEIGHT	DROP	RESPONSIBLE PROFESSIONAL	REG. NO.

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/Foot	LITHOLOGY	DESCRIPTION: NAME (USCS Symbol): color, moist, % by wt., plast., density, structure, cementation, react. w/HCl, geo. inter.	WELL CONST.	REMARKS
					Surface Elevation:		
			2				DRILLER THINKS WE ARE IN MUD BUT CAN'T RECOVER SAMPLE BECAUSE DEBRIS IS ON TOP OF MUD. TRIED TWICE TO RECOVER.
15							
16					S.O.B. 11:20		
17							

DRAFT

WF-1-89/Modified

Geomatrix Consultants	Project No. #	Figure #

1790.04 - D13

PROJECT: 350 INDUSTRIAL WAY Brisbane, California	**Log of Well No. MW-1**
BORING LOCATION: 34' northeast of tank excavation	ELEVATION AND DATUM:
DRILLING CONTRACTOR: HEW Drilling Company, Inc.	DATE STARTED: 11/26/91 / DATE FINISHED: 11/26/91
DRILLING METHOD: Hollow stem auger	TOTAL DEPTH: 15 feet / SCREEN INTERVAL: 7' - 15'
DRILLING EQUIPMENT: CME-75	DEPTH TO WATER ATD: 12 feet / CASING: 2" SCH 40 PVC
SAMPLING METHOD: 5' continuous core, 18" modified California split spoon	LOGGED BY: D. Del Grande/Y. Pierce
HAMMER WEIGHT: 140 lbs / DROP: 30"	RESPONSIBLE PROFESSIONAL: J. Gallinatti / REG. NO. CEG 1335

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/Foot	DESCRIPTION (NAME (USCS Symbol): color, moist, % by wt., plast., density, structure, cementation, react. w/HCl, geo. inter.)	TEST RESULTS	WELL CONSTRUCTION DETAILS
				Surface Elevation:		
0				ASPHALT		Traffic rated Christy Box (G-5)
1				SILT with GRAVEL (ML) Dark reddish brown (5 YR 3/2), moist, 75-80% silt and clay, 15-20% medium to coarse gravel, 5% fine to medium sand, brick, glass, wood chips [Fill]		Locking well cap
2						
3						2"-diameter SCH 40 PVC blank
4				Color change to dark brown (7.5 YR 3/2) Color change to dark olive gray (5 Y 3/2)		
5						Cement-bentonite grout
6						
7						Bentonite pellets
8				Ground up concrete		
9						Lonestar #2/16 lapis luster sand
10				SILTY SAND (SM) Very dark brown (10 YR 2/2), moist, 70-80% fine to medium sand, 20-30% silt and clay, ceramic glass, metal slag [Fill]		2"-diameter SCH 40 PVC 0.02" slot screen
11						
12				Wet ▽ Gradational contact		8-1/4" borehole
13				SAND with SILT (SW - SM) Dark reddish brown (5 YR 3/2), wet, 90% fine to coarse sand, 10% silt, ceramic, glass [Fill]		
14						

W-1-89/Modified

Geomatrix Consultants	Project No. 1790.04	Figure #

PROJECT: 350 INDUSTRIAL WAY
Brisbane, California

Log of Well No. MW-1 (cont'd.)

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/Foot	DESCRIPTION: NAME (USCS Symbol): color, moist, % by wt., plast., density, structure, cementation, react. w/HCl, geo. inter.	TEST RESULTS	WELL CONSTRUCTION DETAILS
15				SAND with SILT (SW - SM) (Continued)		Lonestar #2/16 lapis luster sand; 2"-diameter SCH 40 PVC 0.02" slot screen; 8-1/4" borehole; Slip on end cap with two stainless steel screws
15				SILTY CLAY (CL) Dark greenish gray (5 G 4/1), moist, 100% clay and silt, trace fine sand, very soft, medium plasticity		
16				Bottom of boring at 16 feet. 10:00 am		
17						
18						
19						
20						
21						
22						
23						
24				EXPLANATION		
25				No recovery		
26				Recovery		
27				Drive sample		
28				Sample obtained		
29						
30						
31						

DRAFT

W-2-89/Modified

Geomatrix Consultants	Project No. 1790.04	Figure #

APPENDIX D

Laboratory Data Provided by Geomatrix

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: December 12, 1991
Date Submitted: December 3, 1991
Project: 1790.04

RESULTS OF ANALYSES OF THE SOIL SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES AND GASOLINE USING EPA METHODS 5030 COUPLED TO 8020 and 8015
Results Reported as mg/kg (ppm)

Sample #	Benzene	Toluene	Et-Benzene	Xylenes	Gasoline
SB-5-14.5	<0.02	<0.02	<0.02	<0.07	<2
SB-2-13	<0.02	<0.02	<0.02	<0.07	<2
SB-5-12	0.4	<0.02	<0.02	<0.07	33
SB-7-10.5	0.5	<0.02	<0.02	<0.07	20
SB-8-13	0.3	<0.02	<0.02	<0.07	2
SB-4-13	<0.02	<0.02	<0.02	<0.07	<2
SB-6-12.5	<0.02	<0.02	<0.02	<0.07	<2
Quality Assurance					
Method Blank	<0.02	<0.02	<0.02	<0.07	<2
SB-5-12 (Duplicate)	0.3	<0.02	<0.02	<0.02	32
SB-5-12 (Matrix Spike) Percent Recovery	88%	88%	89%	85%	89%
SB-5-12 (Matrix Spike Duplicate) Percent Recovery	88%	90%	90%	85%	90%
Spike Level	4.4	4.4	4.4	13	10

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: December 12, 1991
Date Submitted: December 3, 1991
Project: 1790.04

RESULTS OF ANALYSES OF THE SOIL SAMPLES FOR TOTAL LEAD BY ICP (6010) Results Reported as µg/g (ppm)

Sample #	Total Lead (ppm)
SB-5-14.5	110
SB-2-13	4,100
SB-5-12	6,700
SB-7-10.5	4,100
SB-8-13	19,000
SB-4-13	5,400
SB-6-12.5	3,700

Quality Assurance

Method Blank	<0.5
SB-5-14.5 (Duplicate)	92
SB-5-14.5 (Matrix Spike) Percent Recovery	ai
SB-5-14.5 (Matrix Spike Duplicate) Percent Recovery	ai
Spike Blank Percent Recovery	110%
Spike Level	50

ai - The amount spiked was insufficient to give meaningful recovery data.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: January 28, 1992
Date Submitted: January 23, 1992
Project: 1790.04

RESULTS OF ANALYSES OF THE SOIL SAMPLES
FOR TOTAL METALS BY
INDUCTIVELY COUPLED PLASMA (ICP)
METHOD 6010
Results Reported as µg/g (ppm)

Analyte:	Copper
Sample:	
SB-5-14.5	32
SB-2-13	910
SB-5-12	5,200
SB-7-10.5	330
SB-8-13	650
SB-4-13	670
SB-6-12.5	1,100
Quality Assurance	
Method Blank	<0.1
SB-6-12.5 (Duplicate)	700
SB-6-12.5 (Matrix Spike) Percent Recovery	ai
SB-6-12.5 (Matrix Spike Duplicate) Percent Recovery	ai
Spike Level	25

ai - The amount spiked was insufficient to give meaningful recovery data.

1790.04-01

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: December 12, 1991
Date Submitted: December 3, 1991
Project: 1790.04

RESULTS OF ANALYSES OF THE SOIL SAMPLES FOR FINGERPRINT CHARACTERIZATION BY CAPILLARY GAS CHROMATOGRAPHY USING FLAME IONIZATION DETECTION (FID) AND ELECTRON CAPTURE DETECTION (ECD)

Sample #	GC Characterization
SB-5-12	The gas chromatographic trace showed the presence of low boiling compounds, such as those found in low levels of gasoline. This characterization is based on the presence of a relatively smooth envelope of peaks present from ca n-C_4 to n-C_8 with a maximum near n-C_6. Trace levels of what could be degraded diesel fuel were also seen. The presence of degraded material is confirmed by highly oxygenated material seen on the ECD trace eluting in a range similar to that of PCB's, though the pattern is not similar to common arochlors.
SB-7-105	The gas chromatographic trace showed the presence of low boiling compounds, such as those found in very low levels of gasoline. This characterization is based on the presence of a relatively smooth envelope of peaks present from ca n-C_4 to n-C_8 with a maximum near n-C_7. The material appeared to be slightly more weathered than the previous sample due to the loss in peak height of front end material. There also appears to be a much smaller amount of degraded material. This is apparent from less oxygenated material showing on the ECD trace.

call w/Results 12-LAB-B

Chain-of-Custody Record

No 264

Date: 26 NOVEMBER 1991 (2 DECEMBER 1991)

Page

Project No.: 1790.04

Samplers (Signature): David L. Crowl

Date	Time	Sample Number	EPA Method 8010	EPA Method 8020	EPA Method 8240	EPA Method 8270	TPH as gasoline	TPH as diesel	TPH as BTEX	CHARACTERIZE PETROLEUM HYDROCARBONS (Look for gas)	LEAD	FB#	Cooled	Soil (S) or water (W)	Acidified	Number of containers
11/25/91	14:05	SB-5-14.5					X		X		X	25465	X	S		1
11/25/91	11:20	SB-2-13					X		X		X	66	X	S		1
11/25/91	13:50	SB-5-12					X		X	X	X	67	X	S		1
11/26/91	10:50	SB-7-10.5					X		X	X	X	68	X	S		1
11/26/91	9:10	SB-8-13					X		X		X	69	X	S		1
11/26/91	8:25	SB-4-13					X		X		X	70	X	S		1
11/26/91	13:35	SB-6-12.5					X		X		X	71	X	S		1
~~12/2/91~~																
~~12/2/91~~																
12/2/91	15:10	MW-1-A					X		X			25472-81	X	W	✓	10
12/2/91	13:20	MW-1-B									X	25482-83	X	W	✓	2

Turnaround time: STANDARD

Results to: ELIZABETH WELLS

Total No. of containers: 19

REMARKS

Additional comments

USE CALIFORNIA LUFT REPORTING LIMITS:

	SOIL	WATER
TPH G	1 ppm	50 ppb
BTX&E	0.005 ppm	0.5 ppb

NO HEADSPACE IN V.O.A. VIALS AT TIME OF SAMPLING

IGNORE "HOLD" ON SOIL LABELS AND ANALYZE FOR TPH G & BTEX; CHARACTERIZE SB-5-12 & SB-7-10.5

SAMPLES MW-1-B FILTERED AT TIME OF SAMPLING

Relinquished by:	Date:	Relinquished by:	Date:	Relinquished by:	Date:	Method of shipment:
Signature: David L. Crowl	12/2/91	Signature:		Signature:		FED EX
Printed name: GEOMATRIX		Printed name:		Printed name:		Laboratory comments and Log No.:
Company:		Company:		Company:		50 ppb Pb okay w/Elizabeth Wells run HFS - footnote if quantifications aren't gas. CMB 12/3
Received by:	Time:	Received by:	Time:	Received by:	Time:	
Signature: Diane Daigre	5:30 PM	Signature: M.A. DANFORD		Signature:		
Printed name: A Daigre		Printed name: FRIEDMAN & BENJA		Printed name:		
Company: FEDEX		Company: DATE: 12-3-91		Company:		

Assumed 5 in analysis

Geomatrix Consultants
100 Pine St. 10th Floor
San Francisco, CA 94111

APPENDIX E
Treadwell & Rollo, Inc.
24 February 1993
Groundwater Monitoring Results
Monitoring Wells K-1 and MW-1

TREADWELL & ROLLO, INC.
Consulting Engineers and Scientists
353 Sacramento Street, Suite 800
San Francisco, California 94111
(415) 955-9040

FILE COPY

24 February 1993
Project 1398.01

Ms. Elizabeth Rouan
County of San Mateo
Department of Health Services
590 Hamilton Street
Redwood City, California 94063

Subject: Groundwater Monitoring Results
Monitoring Wells K-1 and MW-1
Industrial Way Properties
Brisbane, California

Dear Ms. Rouan:

This report presents the results of the recent monitoring activities conducted at 250 and 350 Industrial Way in Brisbane (Figure 1). Treadwell & Rollo, Inc. performed the groundwater monitoring of wells K-1 and MW-1 on 12 January 1993. With the January 1993 round, monitoring wells K-1 and MW-1 have been sampled a total of six and four times, respectively.

The total depth of each well and depth to groundwater were measured prior to well purging. These measurements and the final parameters of pH, temperature, and specific conductance monitored during the well purging are presented in Table 1. Depth to groundwater measurements obtained during the January 1993 sampling round indicate an increase in groundwater elevation of 1.45 feet in well K-1 and 0.94 feet in well MW-1 since the wells were monitored in November 1992.

Prior to sampling, between three and four well volumes of groundwater were purged from each well with a clean stainless steel bailer. A total of 16 gallons was purged from monitoring well K-1, and two gallons were purged from monitoring well MW-1.

After purging, groundwater samples from each well were obtained using a clean, disposable, polyethylene bailer. The samples were decanted from the bailer into the appropriately prepared, laboratory-supplied sample containers. The sample containers were immediately sealed, labeled, and placed into an ice-cooled chest for transport to the analytical laboratory under chain-of-custody procedures. Purge water from the sampling activities was stored on site in labeled 55-gallon drums.

The groundwater samples were analyzed by Curtis & Tompkins, Ltd. analytical laboratories in Berkeley, California, for total volatile hydrocarbons as gasoline (TVHg), benzene, toluene, ethylbenzene, and xylenes (BTEX) by EPA Methods 5030/8020, and for total and dissolved lead by EPA Method 7421. The analytical data for this latest sampling round and available historical data are presented in Table 2. The laboratory analytical data sheets from the January 1993 sampling round are attached.

TVHg, benzene, ethylbenzene, and xylenes were detected in the groundwater sample from monitoring well K-1 at concentrations of 220 µg/l, 3.3 µg/l, 7.5 µg/l, and 4.3 µg/l, respectively. The low concentration of TVHg is generally consistent with concentrations detected in well K-1 since June 1992. Benzene was detected in the latest sampling round for the first time since May 1989 at a concentration of 3.3 µg/l, which is near the detection limit of 0.5 µg/l. The detections of ethylbenzene and xylenes were consistent with historical data. Toluene, total lead, and dissolved lead were not detected at or above applicable reporting limits in groundwater samples from monitoring well K-1 during the January 1993 sample round. These results are consistent with previous analytical data.

TVHg and BTEX were not detected at or above the reporting limits of 50 µg/l and 0.5 µg/l, respectively, in the groundwater sample collected from monitoring well MW-1. This is consistent with historical data. The concentration of total lead detected in the January 1993 sample round in the groundwater sample from MW-1 was 1,500 µg/l, which is greater than the previous maximum concentration of total lead of 260 µg/l detected in June 1992. However, the concentrations of total lead and dissolved lead of 1,500 µg/l and 7 µg/l, respectively, are significantly lower than the State of California Soluble Threshold Limit Concentration of 5,000 µg/l. The concentration of dissolved lead is also significantly less than the EPA Maximum Contaminant Limit of 50 µg/l.

The presence of metal slag and elevated lead concentrations have been detected in site soil near well MW-1 and in the well bore for MW-1. The significant difference between dissolved and total lead concentrations indicates the source of the lead in groundwater may be associated with the presence of metal slag and the elevated lead concentrations in soil in this location.

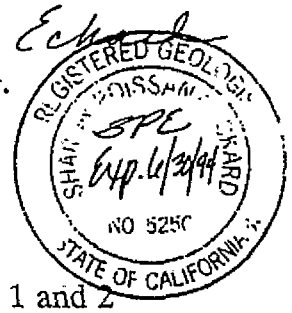
Based on the results of this sampling round, available historical data and the activities associated with the adjacent Bayshore Railyard site, quarterly sampling of the two wells will be suspended until the broader issues presented by the adjacent Bayshore Railyard site have been addressed. On behalf of our client, we will be designing future activities

at the Industrial Way Properties site in response to State of California Department of Toxic Substance Control requests for information and further assessment.

We trust this report provides you with the information you need at this time. If you have any questions, please call.

Sincerely yours,
TREADWELL & ROLLO, INC.

Sharon P. Eckard, R.G.
Project Geologist

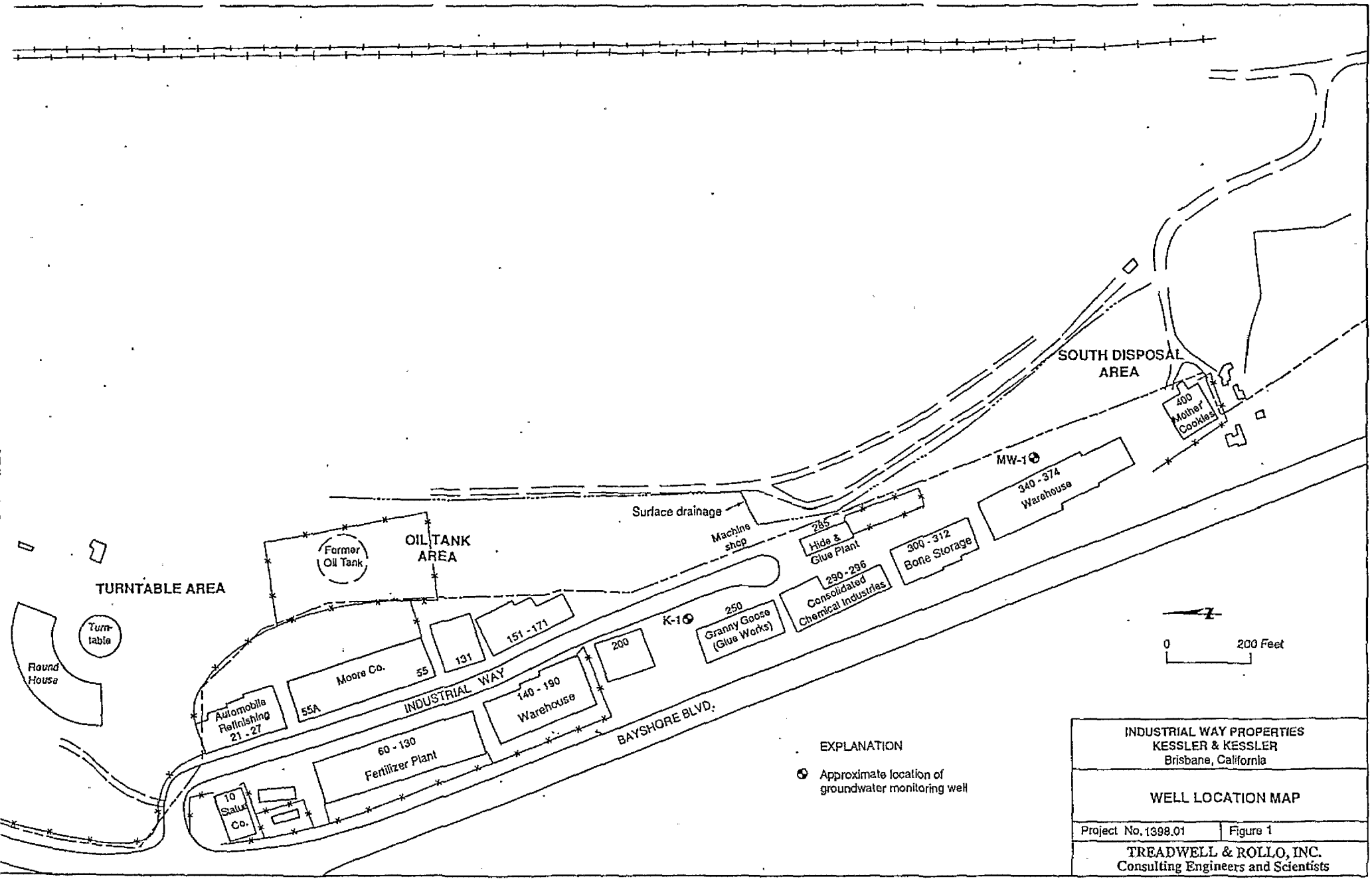


Philip T. Tringale, Ph.D., P.E.
Associate Engineer

SPE:ch
13980102.SPE

Attachments: Tables 1 and 2
Figure 1
Curtis & Tompkins Ltd. Analytical Data

cc: Mr. Leslie M. Kessler, Kessler & Kessler
Ms. Diane Mims, Regional Water Quality Control Board



INDUSTRIAL WAY PROPERTIES
KESSLER & KESSLER
Brisbane, California

WELL LOCATION MAP

Project No. 1398.01 | Figure 1

TREADWELL & ROLLO, INC.
Consulting Engineers and Scientists

TABLE 1
SUMMARY OF PHYSICAL PARAMETERS
GROUNDWATER SAMPLES
INDUSTRIAL WAY PROPERTIES
Brisbane, California
Project 1398.01

Well	Sample Date	Depth to Water (feet)	Well Depth (feet)	pH	Temperature (F)	Specific Conductance (umhos/cm)
K-1	06/92	3.78	27.35	6.78	70.0	6720
	10/92	4.48	27.30	7.14	67.0	1110
	11/92	4.58	27.30	6.83	66.5	1340
	01/93	3.13	27.30	7.01	52.2	6790
MW-1	06/92	11.96	14.50	7.00	70.6	3080
	10/92	12.38	14.49	7.56	68.9	768
	11/92	12.33	14.49	7.03	66.4	3540
	01/93	11.39	14.50	7.02	59.7	3040

Note:
Wells K-1 and MW-1 located at 250 and 350 Industrial Way, Brisbane, California, respectively.

TABLE 2
SUMMARY OF ANALYTICAL RESULTS - GROUNDWATER
INDUSTRIAL WAY PROPERTIES
Brisbane, California
Project 1398.01

Well No.	Sample Date	TPH as Diesel	TPH as Kerosene	TVH as Gasoline	Benzene	Toluene	Ethylbenzene	Total Xylenes	Total Lead	Dissolved Lead
	Detection Limits	50	50	50-100	0.5-1.0	0.5-1.0	0.5-1.0	0.5-2.0	3.0-30	3
K-1	09/88	ND	ND	ND	15	2	ND	120	NA	NA
	05/89	NA	NA	NA	23	ND	35	8	NA	NA
	07/91	*NA*	*NA*	*460*	*ND*	*ND*	*8.5*	*3.3*	*NA*	*60*
	06/92	NA	NA	230	ND	3.4	2.6	0.7	ND	ND
	10/92	NA	NA	NA	NA	NA	NA	NA	ND	ND
	11/92	NA	NA	170	ND	ND	1.4	ND	NA	NA
	01/93	NA	NA	220	3.3	ND	7.5	4.3	ND	ND
MW-1	12/91	NA	NA	ND	ND	ND	ND	ND	NA	120
	06/92	NA	NA	ND	ND	ND	ND	ND	260	33
	10/92	NA	NA	NA	NA	NA	NA	NA	42	22
	11/92	NA	NA	ND	ND	ND	ND	ND	NA	NA
	01/93	NA	NA	ND	ND	ND	ND	ND	1,500	7

Notes:

1. Concentrations are in micrograms/liter (ug/L).
2. *Groundwater monitoring wells K-1 and MW-1* are located at 250 and 350 Industrial Way, Brisbane, California, respectively.
3. NA -Not analyzed; ND-Not detected above the applicable detection limit.
4. Groundwater samples have been obtained by several collectors and submitted to different laboratories as follows:
   - the September 1988 sample was collected by Aqua Resources and submitted to Curtis & Tompkins of Berkeley, California for EPA Test Methods 8015 and 602. Sample also analyzed by EPA Test Method 601 and organic lead by DHS LUFT Manual Method. EDB and organic lead were not detected above the detection limits.
   - the May 1989 sample was collected by Kennedy/Jenks/Chilton and was submitted to an unknown laboratory.
   - the July 1991 sample was submitted to Chromalab Inc. of San Ramon, California for EPA Test Methods 5030/8015, 602, and 7420.
   - the December 1991 sample was collected by Geomatrix Consultants, Inc. and was submitted to Friedman & Bruya, Inc. for analysis by EPA Test Methods 5030/8020 and 8015.
   - the June, October, and November 1992 samples were collected by Treadwell & Rollo, Inc. and submitted to Curtis & Tompkins for EPA Test Methods 5030/8020 and 7421.
5. Historical groundwater data obtained from Geomatrix Consultants 4 September 1991 and Friedman & Bruya laboratory data sheets dated 12 December 1991.
6. The lead analytical results for the July 1991 samples were previously reported as total lead concentrations. A review of previously unavailable Geomatrix Consultants field records indicate the samples were filtered in the field. Hence, these results reflect dissolved lead concentrations.

APPENDIX A

Laboratory Analytical Results

Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878
2323 Fifth Street, Berkeley, CA 94710, Phone (510) 486-0900

RECEIVED
FEB 2 1993
TREADWELL & ROLLO

DATE RECEIVED: 01/12/93
DATE REPORTED: 01/26/93

LABORATORY NUMBER: 109741

CLIENT: TREADWELL & ROLLO, INC.

PROJECT ID: 1398.01

LOCATION: KESSLER

RESULTS: SEE ATTACHED

Reviewed by

Reviewed by

This report may be reproduced only in its entirety.

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 109741
CLIENT: TREADWELL & ROLLO, INC.
PROJECT ID: 1398.01
LOCATION: KESSLER

DATE SAMPLED: 01/12/93
DATE RECEIVED: 01/12/93
DATE ANALYZED: 01/15/93
DATE REPORTED: 01/26/93

Total Volatile Hydrocarbons with BTXE in Aqueous Solutions
TVH by California DOHS Method/LUFT Manual October 1989
BTXE by EPA 5030/8020

LAB ID	SAMPLE ID	TVH AS GASOLINE (ug/L)	BENZENE (ug/L)	TOLUENE (ug/L)	ETHYL BENZENE (ug/L)	TOTAL XYLENES (ug/L)
109741-1	MW-1	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)
109741-2	K-1	220	3.3	ND(0.5)	7.5	4.3

ND = Not detected at or above reporting limit; Reporting limit indicated in parentheses.

QA/QC SUMMARY

RPD, %	7
RECOVERY, %	112

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 109741
CLIENT: TREADWELL & ROLLO, INC.
PROJECT ID: 1398.01
LOCATION: KESSLER

DATE SAMPLED: 01/12/93
DATE RECEIVED: 01/12/93
DATE ANALYZED: 01/22/93
DATE REPORTED: 01/26/93

ANALYSIS: TOTAL LEAD
ANALYSIS METHOD: EPA 7421

LAB ID	SAMPLE ID	RESULT	UNITS	REPORTING LIMIT
109741-1	MW-1	1,500	ug/L	300
109741-2	K-1	ND	ug/L	3

ND = Not detected at or above the reporting limit.

QA/QC SUMMARY:

RPD, %	5
RECOVERY, %	90

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 109741
CLIENT: TREADWELL & ROLLO, INC.
PROJECT ID: 1398.01
LOCATION: KESSLER

DATE SAMPLED: 01/12/93
DATE RECEIVED: 01/12/93
DATE ANALYZED: 01/22/93
DATE REPORTED: 01/26/93

ANALYSIS: DISSOLVED LEAD
ANALYSIS METHOD: EPA 7421

LAB ID	SAMPLE ID	RESULT	UNITS	REPORTING LIMIT
109741-1	MW-1	7	ug/L	3
109741-2	K-1	ND	ug/L	3

ND = Not detected at or above the reporting limit.

QA/QC SUMMARY:

RPD, %	5
RECOVERY, %	90

109741

TREADWELL & ROLLO, INC.
353 Sacramento Street, Suite 800
San Francisco, California 94111
(415) 955-9040
(415) 955-9041 Fax

CHAIN OF CUSTODY RECORD

Project #: 1398.01 Project Name: Kessler Date: 01-12-93 Page 1 of 1

Date	Sample Number	7421	5030/8020				Number of Containers	Sample Information
01-12-93	MW-1	X	X				4	total + dissolved lead not filtered
01-12-93	K-1	X	X				4	total & dissolved lead not filtered

Total Number of Containers: 8

Relinquished By (Sampler):
Signature
Printed Name
Company:
Date: Time:

Received By:
Signature
Printed Name
Company:
Date: 1/12/93 Time: 540 p

Relinquished By:
Signature: [signature]
Printed Name: Marie Hedberg
Company: TRI
Date: Time:
Method of Shipment:

Received by (Lab):
Signature: [signature]
Printed Name: TERESA MORRISON
Lab
Date: 1/12/93 Time: 5:40 pm

Lab Comments
STANDARD TAT

REMARKS: Please send results to Sharon Eckard.

APPENDIX B
Data from Historical Site Investigations

Source: Harding Lawson Associates, 1982
Environmental Assessment of Fill
Former Railyard

TABLE 6-14 GROUNDWATER QUALITY DATA - INORGANICS (mg/l)
(HARDING LAWSON SAMPLES, MAR. 1982)

Well ID EPA MCL*	Sb	As 0.05	Ba 1.00	Cd	Cr 0.05	Co	Cu 1.00#	Pb 0.05
HLA-1	N/A	N/A	N/A	N/A	0.03	N/A	N/A	N/A

Well ID EPA MCL*	Hg	Mo	Ni	Se	Ag	Tl	V	Zn 5.0
HLA-1	0.0003	N/A	N/A	N/A	N/A	N/A	N/A	N/A

N/A: Not Analyzed

* U.S.E.P.A. Maximum Concentration Limit for Drinking Water
Secondary (unenforceable) standard
Source: California Water Quality Control Board (1985)

Source: Ecology and Environment, Inc., 1985
Soil and Groundwater Investigation
of the Southern Pacific Transportation Co, Bayshore Railroad Yard

TABLE 6-15: GROUNDWATER QUALITY DATA - ORGANICS (mg/l)
(HARDING LAWSON SAMPLES, MAR. 1982)

Well ID DOHS AL*	pH	TOC	1,1-DCE 0.0004	PCE 0.004	t-1,2-DCE	TCE 0.005	Vinyl Chloride 0.002	Bis-2EHP	PID (ppm)	Visual Oil
HLA-1	7.3	91	0.075	0.600	2.77	10.0	0.46	0.030	360	No
HLA-2	7.5	5.0	NA	NA	NA	NA	NA	NA	0	No
HLA-3	7.2	6.5	NA	NA	NA	NA	NA	NA	0	No
HLA-4	5.4	9.8	NA	NA	NA	NA	NA	NA	10,000	No
HLA-13	7.5	11	NA	NA	NA	NA	NA	NA	NA	No
HLA-14	7.1	62	NA	NA	NA	NA	NA	NA	160	No
HLA-15	7.3	12	NA	NA	NA	NA	NA	NA	40	No
HLA-16	7.0	15	NA	NA	NA	NA	NA	NA	100	No

* California Department of Health Services Action Level (Source: California Water Resources Control Board, 1985). NA: Not Analyzed

TABLE 6-16: GROUNDWATER QUALITY DATA - INORGANICS (mg/l)
(ECOLOGY AND ENVIRONMENT SAMPLES, JAN. 1984)

Well ID EPA MCL*	As 0.05	Ba 1.00	Cr 0.05	Cu 1.00#	Pb 0.005	Zn 5.0
HLA-1	0.145	0.216	<0.005	.071	0.003	0.023
HLA-2	0.060	<0.200	<0.005	.063	0.009	0.030
HLA-3	0.043	<0.200	0.024	.085	0.014	0.052
HLA-4	0.043	<0.200	<0.005	.071	0.005	0.045
HLA-14	0.092	<0.200	<0.005	.071	0.004	0.030
HLA-15	0.068	<0.200	0.015	.085	0.018	0.074
HLA-16	0.916	<0.200	0.052	.078	0.051	0.067

* U.S.E.P.A. Maximum Concentration Limit for Drinking Water
Secondary (uneforceable) standard
Source: California Water Quality Control Board (1985)

TABLE 6-17: GROUNDWATER QUALITY DATA - ORGANICS (mg/l)
(ECOLOGY AND ENVIRONMENT SAMPLES, JAN. 1984)

Well ID DOHS AL*	Benzene 0.0007	Ethyl- Benzene	Chloroform 0.1#	Toluene 0.10	t-1,2- DCE	TCE 0.005	PCE 0.004
HLA-1	0.00715	0.0184	N/A	0.0275	2.36	0.014	N/A
HLA-2	N/A	N/A	N/A	N/A	1.15	0.747	2.08
HLA-3	N/A	N/A	N/A	N/A	0.0187	0.0094	N/A
HLA-4	N/A	N/A	N/A	N/A	Trace	N/A	N/A
HLA-14	N/A	N/A	N/A	N/A	N/A	0.005	N/A

N/A: Not Analyzed

* California Department of Health Services Action Level

\# EPA Maximum Concentration Limit for Drinking Water; Bromodichloromethane as total trihalomethane.

Source: California Water Resources Control Board (1985)

Table 4-A

ANIONS AND CATIONS IN WATER SAMPLES
(mg/l)

Monitoring Well	6A	6B
Total Alkalinity/ $CaCO_3$	383	251
Calcium	96	117
Iron	17	1.8
Magnesium	33	66.6
Potassium	12.3	3.05
Sodium	87	---
Sulfate	21	55

Source: Ecology and Environment, Inc. 1984.

recycled paper

ecology and environment

RESULTS OF METAL ANALYSES OF WATER SAMPLES

(All results in mg/L.

E & E Sample Number 84-	Sample Identity	Parameter					
		Arsenic	Barium	Lead	Copper	Chromium	Zinc
1604	MW2B [1]	0.011	<0.2	0.010	<0.05	0.094	0.040
1605	MW3A	1.90	2.93	2.84	1.560	1.81	4.88
1606	MW4A	0.126	1.07	0.126	0.181	0.251	0.428
1522	MW5A	0.173	0.915	0.277	0.301	1.515	0.752
1521	MW5B	<0.01	<0.2	0.026	<0.05	0.154	0.058
1527	MW6A	0.045	0.269	0.317	0.314	0.182	0.474
1528	MW6B	<0.01	<0.2	0.015	<0.05	0.111	0.051
1607	MW7A	0.066	0.687	3.06	1.17	0.194	1.98
1525	MW8A	<0.01	<0.2	0.168	0.102	0.088	0.149
1463	MW8B	<0.01	<0.2	0.004	<0.05	0.013	0.098

< = None detected at the stated detection limits.

recycled paper

RESULTS OF WATER ANALYSIS FOR
BASE/NEUTRAL COMPOUNDS

(all results in ug/L)

PP #	CAS #	Compound	E & E Lab Number Sample I.D.	1604 MW 28	1605 MW 3A	1606 MW 4A
(18)	83-32-9	acenaphthene		<10	<10	<10
(58)	92-87-5	benzidine		<10	<10	<10
(88)	120-82-1	1,2,4-trichlorobenzene		<10	<10	<10
(98)	118-74-1	hexachlorobenzene		<10	<10	<10
(128)	67-72-1	hexachloroethane		<10	<10	<10
(188)	111-44-4	bis(2-chloroethyl)ether		<10	<10	<10
(208)	91-58-7	2-chloronaphthalene		<10	<10	<10
(258)	95-50-1	1,2-dichlorobenzene		<10	<10	<10
(268)	541-73-1	1,3-dichlorobenzene		<10	<10	<10
(278)	106-46-7	1,4-dichlorobenzene		<10	<10	<10
(288)	91-94-1	3,3'-dichlorobenzidine		<10	<10	<10
(358)	121-14-2	2,4-dinitrotoluene		<10	<10	<10
(368)	606-20-2	2,6-dinitrotoluene		<10	<10	<10
(378)	122-66-7	1,2-diphenylhydrazine		<10	<10	<10
(398)	206-44-0	fluoranthene		<10	<10	<10
(408)	7005-72-3	4-chlorophenyl phenyl ether		<10	<10	<10
(418)	101-55-3	4-bromophenyl phenyl ether		<10	<10	<10
(428)	39638-32-9	bis(2-chloroisopropyl)ether		<10	<10	<10
(438)	111-91-1	bis(2-chloroethoxy) methane		<10	<10	<10
(528)	87-68-3	hexachlorobutadiene		<10	<10	<10
538)	77-47-4	hexachlorocyclopentadiene		<10	<10	<10
548	78-59-1	isophorone		<10	<10	<10
(558)	91-20-1	naphthalene		<10	<10	<10
(568)	98-95-3	nitrobenzene		<10	<10	<10
(628)	86-30-6	N-nitrosodiphenylamine		<10	<10	<10
(638)	621-64-7	N-nitrosodipropylamine		<10	<10	<10
(668)	117-81-0	bis(2-ethylhexyl) phthalate		<10	<10	<10
(678)	85-68-7	benzyl butyl phthalate		<10	<10	<10
(688)	84-74-2	di-n-butyl phthalate		<10	<10	<10
(698)	117-84-0	di-n-octyl phthalate		<10	<10	<10
(708)	84-66-2	diethyl phthalate		<10	<10	<10
(718)	131-11-3	dimethyl phthalate		<10	<10	<10
(728)	56-55-3	benzo(a)anthracene		<10	<10	<10
(738)	50-32-8	benzo(a)pyrene		<10	<10	<10
(748)	205-99-2	benzo(b)fluoranthene		<10	<10	<10
(758)	207-08-9	benzo(k)fluoranthene		<10	<10	<10
(768)	218-01-9	chrysene		<10	<10	<10
778)	208-96-8	acenaphthylene		<10	<10	<10
(788)	120-12-7	anthracene		<10	<10	<10
(798)	191-24-2	benzo(ghi)perylene		<10	<10	<10
(808)	86-73-7	fluorene		<10	<10	<10
(818)	85-01-8	phenanthrene		<10	<10	<10
(828)	53-70-3	dibenzo(a,h)anthracene		<10	<10	<10
838)	193-39-5	indeno(1,2,3-cd)pyrene		<10	<10	<10
(848)	129-00-0	pyrene		<10	<10	<10

RESULTS OF WATER ANALYSIS FOR
VOLATILE ORGANIC COMPOUNDS

(all results in ug/l

PP#	CAS#	Compound	E & E Lab Number Sample I.D.	1526 8A	1464 8B
(2V)	107-02-8	acrolein		<100	<100
(3V)	107-13-1	acrylonitrile		<100	<100
(4V)	71-43-2	benzene		BMDL	<10
(6V)	56-23-5	carbon tetrachloride		<10	<10
(7V)	108-90-7	chlorobenzene		<10	<10
(10V)	107-06-2	1,2-dichloroethane		<10	<10
(11V)	71-55-6	1,1,1-trichloroethane		<10	<10
(13V)	75-34-3	1,1-dichloroethane		<10	<10
(14V)	79-00-5	1,1,2-trichloroethane		<10	<10
(15V)	79-34-5	1,1,2,2-tetrachloroethane		<10	<10
(16V)	75-00-3	chloroethane		<10	<10
(19V)	110-75-8	2-chloroethylvinyl ether		<10	<10
(23V)	67-66-3	chloroform		<10	<10
(29V)	75-35-4	1,1-dichloroethene		<10	<10
(30V)	156-60-5	trans-1,2-dichloroethene		1130	<10
(32V)	78-87-5	1,2-dichloropropane		<10	<10
(33V)	10061-02-6	trans-1,3-dichloropropene		<10	<10
	10061-01-05	cis-1,3-dichloropropene		<10	<10
(38V)	100-41-4	ethylbenzene		<10	<10
(44V)	75-09-2	methylene chloride		201	275
(45V)	74-87-3	chloromethane		<10	<10
(46V)	74-83-9	bromomethane		<10	<10
(47V)	75-25-2	bromoform		<10	<10
(48V)	75-27-4	bromodichloromethane		<10	<10
(49V)	75-69-4	fluorotrichloromethane		<10	<10
(50V)	75-71-8	dichlorodifluoromethane		<10	<10
(51V)	124-48-1	chlorodibromomethane		<10	<10
(85V)	127-18-4	tetrachloroethene		<10	<10
(86V)	108-88-3	toluene		<10	92
(87V)	79-01-6	trichloroethene		<10	<10
(88V)	75-01-4	vinyl chloride		<10	<10

*BMDL = Compound present but below measurable detection limits.

RESULTS OF WATER ANALYSIS FOR
VOLATILE ORGANIC COMPOUNDS

(all results in ug/L)

PP#	CAS#	Compound	E & E Lab Number Sample I.D.	1604 MW 28	1605 MW 34	1606 MW 33
(2V)	107-02-8	acrolein		<100	<100	<100
(3V)	107-13-1	acrylonitrile		<100	<100	<100
(4V)	71-43-2	benzene		<10	<10	<10
(6V)	56-23-5	carbon tetrachloride		<10	<10	<10
(7V)	108-90-7	chlorobenzene		<10	<10	<10
(10V)	107-06-2	1,2-dichloroethane		<10	<10	<10
(11V)	71-55-6	1,1,1-trichloroethane		<10	<10	<10
(13V)	75-34-3	1,1-dichloroethane		<10	<10	<10
(14V)	79-00-5	1,1,2-trichloroethane		<10	<10	<10
(15V)	79-34-5	1,1,2,2-tetrachloroethane		<10	<10	<10
(16V)	75-00-3	chloroethane		<10	<10	<10
(19V)	110-75-8	2-chloroethylvinyl ether		<10	<10	<10
(23V)	67-66-3	chloroform		<10	<10	<10
(29V)	75-35-4	1,1-dichloroethene		<10	<10	<10
(30V)	156-60-5	trans-1,2-dichloroethene		<10	<10	<10
(32V)	78-87-5	1,2-dichloropropane		<10	<10	<10
(33V)	10061-02-6	trans-1,3-dichloropropene		<10	<10	<10
	10061-01-05	cis-1,3-dichloropropene		<10	<10	<10
(38V)	100-41-4	ethylbenzene		<10	<10	<10
(44V)	75-09-2	methylene chloride		<10	<10	<10
(45V)	74-87-3	chloromethane		<10	<10	<10
(46V)	74-83-9	bromomethane		<10	<10	<10
(47V)	75-25-2	bromoform		<10	<10	<10
(48V)	75-27-4	bromodichloromethane		<10	<10	<10
(49V)	75-69-4	fluorotrichloromethane		<10	<10	<10
(50V)	75-71-8	dichlorodifluoromethane		<10	<10	<10
(51V)	124-48-1	chlorodibromomethane		<10	<10	<10
(85V)	127-18-4	tetrachloroethene		<10	<10	<10
(86V)	108-88-3	toluene		<10	BMDL	<10
(87V)	79-01-6	trichloroethene		<10	<10	<10
(88V)	75-01-4	vinyl chloride		<10	<10	<10

BMDL = Compound present but below measurable detection limits.

RESULTS OF WATER ANALYSIS FOR
VOLATILE ORGANIC COMPOUNDS

(all results in ug/L)

PP#	CAS#	Compound	E & E Lab Number / Sample I.D.	1522 5A	1521 5B	1527 6A	1529 6B	1607 7A
2V.	107-02-8	acrolein		<100	<100	<100	<100	<100
(3V)	107-13-1	acrylonitrile		<100	<100	<100	<100	<100
(4V)	71-43-2	benzene		<100	<10	BMDL	<10	<10
(6V)	56-23-5	carbon tetrachloride		<10	<10	<10	<10	<10
(7V)	108-90-7	chlorobenzene		<10	<10	<10	<10	<10
(10V.	107-06-2	1,2-dichloroethane		<10	<10	<10	<10	<10
(11V)	71-55-6	1,1,1-trichloroethane		<10	<10	<10	<10	<10
(13V)	75-34-3	1,1-dichloroethane		<10	<10	<10	<10	<10
(14V	79-00-5	1,1,2-trichloroethane		<10	<10	<10	<10	<10
(15V.	79-34-5	1,1,2,2-tetrachloroethane		<10	<10	<10	<10	<10
(16V)	75-00-3	chloroethane		<10	<10	<10	<10	<10
(19V	110-75-8	2-chloroethylvinyl ether		<10	<10	<10	<10	<10
(23V	67-66-3	chloroform		<10	<10	<10	<10	<10
(29	75-35-4	1,1-dichloroethene		<10	<10	<10	<10	<10
30V	156-60-5	trans-1,2-dichloroethene		<10	<10	1230	<10	610
32V	78-87-5	1,2-dichloropropane		<10	<10	<10	<10	<10
33V	10061-02-6	trans-1,3-dichloropropene		<10	<10	<10	<10	<10
	10061-01-05	cis-1,3-dichloropropene		<10	<10	<10	<10	<10
38	100-41-4	ethylbenzene		<10	<10	<10	<10	<10
44V	75-09-2	methylene chloride		533	615	144	166	618
45V	74-87-3	chloromethane		<10	<10	<10	<10	<10
46V	74-83-9	bromomethane		<10	<10	<10	<10	<10
47V	75-25-2	bromoform		<10	<10	<10	<10	<10
48	75-27-4	bromodichloromethane		<10	<10	<10	<10	<10
49V	75-69-4	fluorotrichloromethane		<10	<10	<10	<10	<10
(50V)	75-71-8	dichlorodifluoromethane		<10	<10	<10	<10	<10
(51V)	124-48-1	chlorodibromomethane		<10	<10	<10	<10	<10
(85V)	127-18-4	tetrachloroethene		10,100	16	17	<10	<10
(86V)	108-88-3	toluene		<10	12	<10	<10	<10
(87V)	79-01-6	trichloroethene		9,550	5,850	2,080	<10	<10
(88V)	75-01-4	vinyl chloride		<10	<10	<10	<10	<10

BMDL = Compound present but below measurable detection limits.

RESULTS OF WATER ANALYSIS FOR
BASE/NEUTRAL COMPOUNDS

(all results in ug/L)

PP #	CAS #	Compound	E & E Lab Number Sample I.D.	1525 8A	1464 8B
(1B)	83-32-9	acenaphthene		<10	<10
(5B)	92-87-5	benzidine		<10	<10
(8B)	120-82-1	1,2,4-trichlorobenzene		<10	<10
(9B)	118-74-1	hexachlorobenzene		<10	<10
(12B)	67-72-1	hexachloroethane		<10	<10
(18B)	111-44-4	bis(2-chloroethyl)ether		<10	<10
(20B)	91-58-7	2-chloronaphthalene		<10	<10
(25B)	95-50-1	1,2-dichlorobenzene		<10	<10
(26B)	541-73-1	1,3-dichlorobenzene		<10	<10
(27B)	106-46-7	1,4-dichlorobenzene		<10	<10
(28B)	91-94-1	3,3'-dichlorobenzidine		<10	<10
(35B)	121-14-2	2,4-dinitrotoluene		<10	<10
(36B)	606-20-2	2,6-dinitrotoluene		<10	<10
(37B)	122-66-7	1,2-diphenylhydrazine		<10	<10
(39B)	206-44-0	fluoranthene		<10	<10
(40B)	7005-72-3	4-chlorophenyl phenyl ether		<10	<10
(41B)	101-55-3	4-bromophenyl phenyl ether		<10	<10
(42B)	39638-32-9	bis(2-chloroisopropyl)ether		<10	<10
(43B)	111-91-1	bis(2-chloroethoxy) methane		<10	<10
(52B)	87-68-3	hexachlorobutadiene		<10	<10
(53B)	77-47-4	hexachlorocyclopentadiene		<10	<10
(54B)	78-59-1	isophorone		<10	<10
(55B)	91-20-1	naphthalene		<10	<10
(56B)	98-95-3	nitrobenzene		<10	<10
(62B)	86-30-6	N-nitrosodiphenylamine		<10	<10
(63B)	621-64-7	N-nitrosodipropylamine		<10	<10
(66B)	117-81-0	bis(2-ethylhexyl) phthalate		<10	<10
(67B)	85-68-7	benzyl butyl phthalate		<10	<10
(68B)	84-74-2	di-n-butyl phthalate		<10	<10
(69B)	117-84-0	di-n-octyl phthalate		<10	<10
(70B)	84-66-2	diethyl phthalate		<10	<10
(71B)	131-11-3	dimethyl phthalate		<10	<10
(72B)	56-55-3	benzo(a)anthracene		<10	<10
(73B)	50-32-8	benzo(a)pyrene		<10	<10
(74B)	205-99-2	benzo(b)fluoranthene		<10	<10
(75B)	207-08-9	benzo(k)fluoranthene		<10	<10
(76B)	218-01-9	chrysene		<10	<10
(77B)	208-96-8	acenaphthylene		<10	<10
(78B)	120-12-7	anthracene		<10	<10
(79B)	191-24-2	benzo(ghi)perylene		<10	<10
(80B)	86-73-7	fluorene		<10	<10
(81B)	85-01-8	phenanthrene		<10	<10
(82B)	53-70-3	dibenzo(a,h)anthracene		<10	<10
(83B)	193-39-5	indeno(1,2,3-cd)pyrene		<10	<10
(84B)	129-00-0	pyrene		<10	<10

RESULTS OF WATER ANALYSIS FOR
BASE/NEUTRAL COMPOUNDS

(all results in ug/L)

PP #	CAS #	Compound	E & E Lab Number Sample I.D.	1522 5A	1521 5B	1527 6A	1528 6B	1637 7A
(18)	83-32-9	acenaphthene		<10	<10	<10	<10	<10
(58)	92-87-5	benzidine		<10	<10	<10	<10	<10
(88)	120-82-1	1,2,4-trichlorobenzene		<10	<10	<10	<10	<10
(98)	118-74-1	hexachlorobenzene		<10	<10	<10	<10	<10
(129)	67-72-1	hexachloroethane		<10	<10	<10	<10	<10
(138)	111-44-4	bis(2-chloroethyl)ether		<10	<10	<10	<10	<10
(208)	91-58-7	2-chloronaphthalene		<10	<10	<10	<10	<10
(258)	95-50-1	1,2-dichlorobenzene		<10	<10	<10	<10	<10
(268)	541-73-1	1,3-dichlorobenzene		<10	<10	<10	<10	<10
278)	106-46-7	1,4-dichlorobenzene		<10	<10	<10	<10	<10
288	91-94-1	3,3'-dichlorobenzidine		<10	<10	<10	<10	<10
358	121-14-2	2,4-dinitrotoluene		<10	<10	<10	<10	<10
368)	606-20-2	2,6-dinitrotoluene		<10	<10	<10	<10	<10
378	122-66-7	1,2-diphenylhydrazine		<10	<10	<10	<10	<10
398	206-44-0	fluoranthene		<10	<10	<10	<10	<10
408	7005-72-3	4-chlorophenyl phenyl ether		<10	<10	<10	<10	<10
418	101-55-3	4-bromophenyl phenyl ether		<10	<10	<10	<10	<10
428	39638-32-9	bis(2-chloroisopropyl)ether		<10	<10	<10	<10	<10
438	111-91-1	bis(2-chloroethoxy) methane		<10	<10	<10	<10	<10
528	87-68-3	hexachlorobutadiene		<10	<10	<10	<10	<10
538	77-47-4	hexachlorocyclopentadiene		<10	<10	<10	<10	<10
548	78-59-1	isophorone		<10	<10	<10	<10	<10
558	91-20-3	naphthalene		<10	<10	<10	<10	<10
568)	98-95-3	nitrobenzene		<10	<10	<10	<10	<10
628)	86-30-6	N-nitrosodiphenylamine		<10	<10	<10	<10	<10
(638)	621-64-7	N-nitrosodipropylamine		<10	<10	<10	<10	<10
(668)	117-81-0	bis(2-ethylhexyl) phthalate		<10	<10	<10	<10	<10
(678)	85-68-7	benzyl butyl phthalate		<10	<10	<10	<10	<10
688)	84-74-2	di-n-butyl phthalate		<10	<10	<10	<10	<10
(698)	117-84-0	di-n-octyl phthalate		<10	<10	<10	<10	<10
(708)	84-66-2	diethyl phthalate		<10	<10	<10	<10	<10
(718)	131-11-3	dimethyl phthalate		<10	<10	<10	<10	<10
(728)	56-55-3	benzo(a)anthracene		<10	<10	<10	<10	<10
(738)	50-32-8	benzo(a)pyrene		<10	<10	<10	<10	<10
748)	205-99-2	benzo(b)fluoranthene		<10	<10	<10	<10	<10
758)	207-08-9	benzo(k)fluoranthene		<10	<10	<10	<10	<10
768)	218-01-9	chrysene		<10	<10	<10	<10	<10
778	208-96-8	acenaphthylene		<10	<10	<10	<10	<10
788)	120-12-7	anthracene		<10	<10	<10	<10	<10
798)	191-24-2	benzo(ghi)perylene		<10	<10	<10	<10	<10
808)	86-73-7	fluorene		<10	<10	<10	<10	<10
818)	85-01-8	phenanthrene		<10	<10	<10	<10	<10
(828)	53-70-3	dibenzo(a,h)anthracene		<10	<10	<10	<10	<10
838)	193-39-5	indeno(1,2,3-cd)pyrene		<10	<10	<10	<10	<10
848	129-00-0	pyrene		<10	<10	<10	<10	<10

Source: Mark Group, 1986
Interim Report for the Remedial Action Alternative Feasibility Study
of the Bayshore Facility

TABLE 4-3: The MARK Group Analyses

Parameter	Detection Limit Water (mg/l)	Detection Limit Soil (mg/kg)	Analysis Method Water	Analysis Method Soil
Methyl Chloride	0.0002	0.002	601/602	8010/8020
Vinyl Chloride	0.0001	0.001	601/602	8010/8020
Methyl Bromide	0.0001	0.001	601/602	8010/8020
Ethyl Chloride	0.0001	0.001	601/602	8010/8020
Dichlorodifluoromethane	0.001	0.005	601/602	8010/8020
Trichlorotrifluoroethane (F-113)	0.010	0.010	601/602	8010/8020
Methylene Chloride	0.010	0.010	601/602	8010/8020
Trichlorofluoromethane	0.0001	0.001	601/602	8010/8020
t-1,2-Dichloroethene (t-1,2-DCE)	0.0001	0.001	601/602	8010/8020
1,1-Dichloroethane (1,1-DCA)	0.0001	0.001	601/602	8010/8020
Chloroform	0.0001	0.001	601/602	8010/8020
1,1,1-Trichloroethane (1,1,1-TCA)	0.0001	0.001	601/602	8010/8020
1,2-Dichloroethane (1,2-DCA)	0.0001	0.001	601/602	8010/8020
Carbon Tetrachloride (Carbon Tet.)	0.0001	0.001	601/602	8010/8020
Benezene	0.0001	0.001	601/602	8010/8020
1,2-Dichloropropane	0.0001	0.001	601/602	8010/8020
c-1,3-Dichloropropene	0.0001	0.001	601/602	8010/8020
Trichloroethene (TCE)	0.0001	0.001	601/602	8010/8020
Bromodichlormethane	0.0001	0.001	601/602	8010/8020
t-1,3-Dichloropropene	0.0001	0.001	601/602	8010/8020
Toluene	0.0002	0.002	601/602	8010/8020
1,1,2-Trichloroethane (TCA)	0.0001	0.0001	601/602	8010/8020
Dibromochloromethane	0.0001	0.001	601/602	8010/8020
Tetrachloroethylene (PCE)	0.0001	0.001	601/602	8010/8020
Chlorobenzene	0.0001	0.001	601/602	8010/8020
Ethylbenzene	0.0001	0.001	601/602	8010/8020
Bromoform	0.0002	0.002	601/602	8010/8020
1,1,2,2-Tetrachloroethane (1,1,2,2-PCA)	0.0005	0.005	601/602	8010/8020
Dichlorobenzenes	0.0001	0.001	601/602	8010/8020
Xylenes	0.0001	0.001	601/602	8010/8020
2-Chloroethylvinyl Ether	0.0001	0.001	601/602	8010/8020
Alicyclics Early	1.0	NA	8240	NA
Aliphatics Early	0.5	NA	8240	NA
Unsaturates Early	1.0	NA	8240	NA
Alklynaphthalenes Early	2.0	NA	8240	NA
Alicyclics Late	1.0	NA	8240	NA
Aliphatics Late	0.1	NA	8240	NA
Unsaturates Late	1.0	NA	8240	NA
Aklylaromatics	10.	NA	8240	NA
C-2 Alkylnaphthalenes	5	NA	8240	NA
Aklylnaphthalenes Late	2.0	NA	8240	NA

TABLE 6-21: GROUNDWATER QUALITY DATA - INORGANICS (mg/l)
(MARK GROUP SAMPLES APR. AND JUNE 1986)

I.D.	As	Ba	Cr	Cu	Pb	Zn
EPA MCL*	0.05	1.00	0.05	1.00#	0.05	5.0
MK-2A	0.07	<0.1	<0.005	<0.04	<0.005	<0.04
MW-2B	<0.005	0.1	<0.005	<0.04	<0.005	<0.04
MW-3A	<0.005	<0.1	<0.005	<0.04	<0.005	<0.04
MK-3B	<0.005	0.2	<0.005	<0.04	<0.005	<0.04
MK-4A	<0.005	<0.1	<0.005	<0.04	<0.005	<0.04
MK-4B	<0.005	<0.1	<0.005	<0.04	<0.005	<0.04
MW-4A	0.021	<0.1	<0.005	<0.04	<0.005	<0.04
MK-5A	0.02	<0.1	<0.005	<0.04	<0.005	<0.04
MK-5B	<0.005	<0.1	<0.005	<0.04	<0.005	<0.04
MW-5A	<0.005	0.2	0.04	<0.04	0.01	0.04
MW-5B	<0.005	0.2	0.03	<0.04	0.03	<0.04
MK-6A	0.028	0.1	0.01	<0.04	<0.005	<0.04
MK-6B	<0.005	0.2	0.01	<0.04	<0.005	<0.04
MW-6A	<0.005	<0.1	<0.005	<0.04	<0.005	<0.04
MW-6B	<0.005	<0.1	0.01	<0.04	<0.005	<0.04
MW-7A	<0.005	0.3	<0.005	0.09	0.46	0.12
MW-8A	<0.005	<0.1	<0.005	<0.04	<0.005	<0.04
MW-8B	<0.005	<0.1	<0.005	<0.04	<0.005	<0.04

* U.S.E.P.A. Maximum Concentration Limit for Drinking Water
\# Secondary (unenforceable) standard
Source: California Water Quality Control Board (1985)

TABLE 6-22: GROUNDWATER QUALITY DATA - ORGANICS (mg/l)
(MARK GROUP SAMPLES APR. AND JUNE 1986)

SAMPLE I.D.	Benzene	TCE	1,1,1-TCA	1,1,2-TCA	Toluene	PCE
DOHS AL*	0.0007	0.005	0.200		0.10	0.004
MK-2A	ND	ND	ND	ND	ND	ND
MK-22A	ND	0.015	ND	ND	ND	ND
MW-2B	ND	ND	ND	ND	ND	ND
MW-3A	0.0006	ND	ND	ND	0.0009	ND
MK-3B	ND	ND	ND	ND	ND	ND
MK-4A	ND	ND	ND	ND	ND	ND
MK-4B	ND	0.0013	ND	ND	ND	ND
MW-4A	0.0003	ND	ND	ND	0.0012	ND
MK-5A	ND	ND	ND	ND	ND	ND
MK-5B	ND	ND	ND	ND	ND	ND
MW-5A	ND	1000	ND	ND	NA	48.00
MW-5A@	ND	140	0.047	0.13	ND	8.7
MW-5B	0.0005	0.044	ND	ND	0.0002	ND
MW-5B@	ND	0.007	ND	ND	ND	ND
MK-6A	ND	ND	ND	ND	ND	ND
MK-6B	ND	ND	ND	ND	ND	ND
MW-6A	ND	0.079	ND	ND	0.0002	0.006
MW-6B	ND	0.018	ND	ND	ND	0.0031
MW-7A	0.0008	0.34	ND	ND	0.0006	0.076
MW-8A	0.0002	ND	ND	ND	ND	ND
MW-8B	ND	0.001	ND	ND	ND	0.0001

ND: Not Detected

TABLE 6-22: GROUNDWATER QUALITY DATA - ORGANICS (ug/l) (continued)
(MARK GROUP SAMPLES APR. AND JUNE 1986)

SAMPLE I.D.	Methylene Chloride	Ethyl Chloride	c-1,2-DCE	t-1,2-DCE	1,1-DCA	Chloroform
DOHS AL*	0.04				0.001	0.1#
MK-2A	ND	ND	ND	ND	ND	ND
MK-2A-2	ND	ND	ND	ND	ND	ND
MW-2B	ND	ND	ND	ND	ND	ND
MW-3A	ND	ND	ND	ND	ND	ND
MK-3B	ND	ND	ND	ND	ND	ND
MK-4A	ND	ND	ND	ND	ND	ND
MK-4B	ND	ND	ND	ND	ND	ND
MW-4A	ND	ND	ND	ND	ND	ND
MK-5A	0.50	ND	ND	ND	ND	ND
MK-5B	ND	ND	ND	ND	ND	ND
MW-5A	ND	ND	ND	ND	ND	ND
MW-5A@	ND	ND	0.83	ND	ND	ND
MW-5B	ND	ND	ND	ND	ND	0.0002
MW-5B@	ND	ND	ND	ND	ND	ND
MK-6A	ND	ND	ND	ND	ND	ND
MK-6B	ND	ND	ND	ND	ND	ND
MW-6A	ND	ND	0.059	ND	ND	ND
MW-6B	ND	ND	ND	ND	ND	ND
MW-7A	ND	ND	0.63	0.0029	ND	ND
MW-8A	ND	ND	0.64	ND	ND	ND
MW-8B	ND	ND	ND	ND	ND	ND

TABLE 6-22: GROUNDWATER QUALITY DATA - ORGANICS (mg/l) (continued)
(MARK GROUP SAMPLES APR. AND JUNE 1986)

SAMPLE I.D.	Chloro-benzene	Ethyl Benzene	Xylene	1,1,2,2-PCA	Carbon Tet.	dichloro-methane
DOHS AL*			0.62		0.005	.100#
MK-2A	ND	ND	ND	ND	ND	ND
MK-2A-2	ND	ND	0.0023	ND	ND	ND
MW-2B	ND	0.0004	0.0016	ND	ND	ND
MW-3A	ND	0.0005	0.0032	ND	ND	ND
MK-3B	ND	ND	0.0006	ND	ND	ND
MK-4A	ND	ND	ND	ND	ND	ND
MK-4B	ND	ND	ND	ND	ND	ND
MW-4A	ND	0.0005	0.0038	ND	ND	ND
MK-5A	ND	ND	ND	ND	ND	ND
MK-5B	ND	ND	ND	ND	ND	ND
MW-5A	ND	ND	ND	ND	ND	ND
MK-5A@	ND	ND	ND	ND	ND	ND
MW-5B	ND	0.0002	ND	ND	ND	ND
MW-5B@	ND	ND	ND	ND	ND	ND
MK-6A	ND	ND	ND	ND	ND	ND
MK-6B	ND	ND	ND	ND	ND	ND
MW-6A	ND	0.0001	ND	ND	ND	ND
MW-6B	ND	ND	ND	ND	ND	ND
MW-7A	0.0005	ND	ND	0.0018	ND	ND
MW-8A	ND	ND	ND	ND	ND	ND
MW-8B	ND	ND	ND	ND	ND	ND

* California Department of Health Services Action Level
@ June 1986 Sampling
\# EPA Maximum Concentration Limit for Drinking Water; Bromodichloromethane as total trihalomethanes. Source: California Water Resources Control Board (1985)

Source: S.S. Papadopulos and Associates, 1989
(tables taken from Levine-Fricke, 1990)
Groundwater Monitoring Plan, Southern Pacific Transportation Company
Bayshore Yard

Table 4-3
Southern Pacific Transportation Company (Bayshore Yard)
Ground Water Metals Analyses
Report Form #1

Sample Number	QA/QC Identification	Lab Code	Date Sampled	Arsenic mg/l	Barium mg/l	Total Chromium mg/l	Copper mg/l	Lead mg/l	Zinc mg/l
MK-02A		CCA	04/22/86	0.07	<0.1	<0.005	<0.040	<0.005	<0.040
MK-02A	FDUPE-MK22-A	CCA	04/22/86	0.11	<0.1	<0.005	<0.040	<0.005	<0.040
MK-02A		SEQ	03/01/89	<0.01	0.13	<0.005	<0.01	<0.005	0.06
MK-03B		CCA	04/22/86	<0.005	0.2	<0.005	<0.040	<0.005	<0.040
MK-04A		CCA	04/22/86	<0.005	<0.1	<0.005	<0.040	<0.005	<0.040
MK-04B		CCA	04/22/86	<0.005	<0.1	<0.005	<0.040	<0.005	<0.040
MK-05A		CCA	04/22/86	0.020	<0.1	<0.005	<0.040	<0.005	<0.040
MK-05B		CCA	04/22/86	<0.005	<0.1	<0.005	<0.040	<0.005	<0.040
MK-06A		CCA	04/23/86	0.028	0.1	0.010	<0.040	<0.005	<0.040
MK-06A		SEQ	03/01/89	0.023	0.16	<0.005	<0.01	0.013	0.042
MK-06B		CCA	04/21/86	<0.005	0.2	0.01	<0.040	<0.005	<0.040
MK-06B	FDUPE MK-16B	CCA	04/21/86	<0.005	<0.1	<0.01	<0.040	<0.005	0.06
MK-06B		SEQ	03/01/89	<0.01	0.18	0.012	<0.01	<0.005	0.086

Table 4-3
Southern Pacific Transportation Company (Bayshore Yard)
Ground Water Metals Analyses
Report Form #1

Sample Number	DAQC Identification	Lab Code	Date Sampled	Arsenic mg/l	Barium mg/l	Total Chromium mg/l	Copper mg/l	Lead mg/l	Zinc mg/l
MK-09A		CCA	06/19/86	<0.005	<0.1	<0.005	<0.040	<0.005	0.06
MK-09A		SEQ	03/05/89	<0.01	0.11	<0.005	<0.01	<0.005	0.044
MK-09B		CCA	06/19/86	<0.005	<0.1	<0.005	<0.040	<0.005	0.09
MK-09B		SEQ	03/05/89	<0.01	0.13	<0.005	<0.01	<0.005	0.038
MK-09B	FOUPE MK-19B	SEQ	03/05/89	<0.01	0.14	0.11	<0.01	<0.005	0.046
MW-02B		CCA	04/22/86	<0.005	0.1	<0.005	<0.040	<0.005	<0.040
MW-02B		SEQ	03/01/89	<0.01	0.13	0.026	0.019	<0.005	0.041
MW-03A		CCA	04/22/86	<0.005	<0.1	<0.005	<0.040	<0.005	<0.040
MW-04A		CCA	04/22/86	0.021	<0.1	<0.005	<0.040	<0.005	<0.040
MW-05A		CCA	04/17/86	<0.005	0.2	0.036	<0.040	0.011	<0.040
MW-05B		CCA	04/17/86	<0.005	0.2	0.032	<0.040	0.030	<0.040
MW-06A		CCA	04/17/86	<0.005	<0.1	<0.005	<0.040	<0.005	<0.040

Table 4-3
Southern Pacific Transportation Company (Bayshore Yard)
Ground Water Metals Analyses
Report Form #1

Sample Number	OAOC Identification	Lab Code	Date Sampled	Arsenic mg/l	Barium mg/l	Total Chromium mg/l	Copper mg/l	Lead mg/l	Zinc mg/l
MW-06B		CCA	04/17/86	<0.005	<0.1	0.009	<0.040	<0.005	<0.040
MW-07A		CCA	04/17/86	<0.005	0.3	<0.005	0.09	0.46	0.12
MW-08A		CCA	04/17/86	<0.005	<0.1	<0.005	<0.040	<0.005	<0.040
MW-08A	UNFIL\PRESERVED	CCA	08/12/86	0.021	0.17	0.23	4.8	12	24
MW-08A	FILT\PRESERVED	CCA	08/12/86	- -	0.049	0.092	- -	- -	1.2
MW-08B		CCA	04/17/86	<0.005	<0.1	<0.005	<0.040	<0.005	<0.040

Table 4-4
Southern Pacific Transportation Company (Bayshore Yard)
Ground Water Organics Analyses
Report Form # 1

Sample Number	Test Method	QAQC Identification	Lab Code	Date Sampled	Benzene ug/l	Bromodichloro-methane ug/l	Bromoform ug/l	Bromo-methane ug/l	Carbontetra-chloride ug/l	Chloro-benzene ug/l	Chloro-ethane ug/l	2-Chloroethyl-vinyl ether ug/l	Chloroform ug/l	Chloromethane ug/l
MK-02A	601\602		CCA	04/22/86	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<1.0	<0.1	<0.2
MK-02A	8010/8020		SEQ	03/02/89	0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	<0.5	<0.5
MK-03B	601\602		CCA	04/22/86	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<1.0	<0.1	<0.2
MK-03B	8010/8020		SEQ	03/07/89	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	<0.5	<0.5
MK-04A	601\602		CCA	04/22/86	0.3	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<1.0	<0.1	<0.2
MK-04A	8010/8020		SEQ	03/03/89	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	<0.5	<0.5
MK-04B	601\602		CCA	04/22/86	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<1.0	<0.1	<0.2
MK-04B	8010/8020		SEQ	03/03/89	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	<0.5	<0.5
MK-05A	601\602		CCA	04/22/86	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<1.0	<0.1	<0.2
MK-05A	8010/8020		SEQ	03/05/89	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	<0.5	<0.5
MK-05B	601\602		CCA	04/22/86	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<1.0	<0.1	<0.2
MK-06A	601\602		CCA	04/23/86	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<1.0	<0.1	<0.2
MK-06A	8010/8020		SEQ	03/03/89	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	<0.5	<0.5
MK-06B	601\602		CCA	04/21/86	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<1.0	<0.1	<0.2
MK-06B	601\602	FOUPE MK-16B	CCA	04/29/86	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<1.0	<0.1	<0.2

Table 4-4
Southern Pacific Transportation Company (Bayshore Yard)
Ground Water Organics Analyses
Report Form # 1

Sample Number	Test Method	QA/QC Identification	Lab Code	Date Sampled	Benzene ug/l	Bromodichloro-methane ug/l	Bromoform ug/l	Bromo-methane ug/l	Carbontetra-chloride ug/l	Chloro-benzene ug/l	Chloro-ethane ug/l	2-Chloroethyl-vinyl ether ug/l	Chloroform ug/l	Chloromethane ug/l
MK-06B	8010/8020		SEQ	03/03/89	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	<0.5	<0.5
MK-09A	601\602		CCA	06/19/86	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<1.0	<0.1	<0.2
MK-09A	8010/8020		SEQ	03/07/89	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	<0.5	<0.5
MK-09B	601\602		CCA	06/19/86	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<1.0	<0.1	<0.2
MK-09B	8010/8020		SEQ	03/07/89	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	<0.5	<0.5
MK-09B	8010/8020	FDUPE MK-09B	SEQ	03/07/89	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	<0.5	<0.5
MK-22A	601\602	FDUPE-MK02-A	CCA	04/22/86	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<1.0	<0.1	<0.2
MW-02B	601\602		CCA	04/22/86	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<1.0	<0.1	<0.2
MW-03B	8010/8020		SEQ	03/07/89	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	<0.5	<0.5

Table 4-4
Southern Pacific Transportation Company (Bayshore Yard)
Ground Water Organics Analyses
Report Form # 1

Sample Number	Test Method	QAQC Identification	Lab Code	Date Sampled	Benzene ug/l	Bromodichloro-methane ug/l	Bromoform ug/l	Bromo-methane ug/l	Carbontetra-chloride ug/l	Chloro-benzene ug/l	Chloro-ethane ug/l	2-Chloroethyl-vinyl ether ug/l	Chloroform ug/l	Chloromethane ug/l
MW-03A	601\602		CCA	04/22/86	0.6	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<1.0	<0.1	<0.2
MW-03A	8010/8020		SEQ	03/07/89	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	<0.5	<0.5
MW-04A	601\602		CCA	04/22/86	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<1.0	<0.1	<0.2
MW-04A	8010/8020		SEQ	03/05/89	<25	<50	<50	<50	<50	<50	<250	<50	<25	<25
MW-05A	601\602		CCA	04/17/86	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<1.0	<0.1	<0.2
MW-05A	601\602		CCA	06/30/86	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<1.0	<0.1	<0.2
MW-05A	5030/8020		SEQ	03/09/89	<0.5	- -	- -	- -	- -	- -	- -	- -	- -	- -
MW-05B	601\602		CCA	04/17/86	0.5	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<1.0	0.21	<0.2
MW-05B	601\602		CCA	06/30/86	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<1.0	<0.1	<0.2
MW-05B	5030/8010		SEQ	03/09/89	- -	<10	<10	<10	<10	<10	<50	<10	<5.0	<5.0
MW-05B	5030/8020		SEQ	03/09/89	<0.5	- -	- -	- -	- -	- -	- -	- -	- -	- -
MW-06A	601\602		CCA	04/17/86	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<1.0	<0.1	<0.2
MW-06A	8010/8020		SEQ	03/05/89	<25	<50	<50	<50	<50	<50	<250	<50	<25	<25
MW-06B	601\602		CCA	04/17/86	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<1.0	<0.1	<0.2
MW-06B	8010/8020		SEQ	03/05/89	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	<0.5	<0.5
MW-07A	601\602		CCA	04/17/86	0.8	<0.1	<0.2	<0.1	<0.1	0.5	<0.1	<1.0	<0.1	<0.2
MW-08A	601\602		CCA	04/17/86	0.2	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<1.0	<0.1	<0.2
MW-08A	8010/8020		SEQ	03/05/89	<25	<50	<50	<50	<50	<50	<250	<50	<25	<25
MW-08B	8010/8020		SEQ	03/05/89	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	<0.5	<0.5

Table 4-4 (cont)
Southern Pacific Transportation Company (Bayshore Yard)
Ground Water Organics Analyses
Report Form # 2

mple mber	Test Method	QAQC Identification	Date Sampled	Dibromochloro-methane ug/l	1,2-Dichloro-benzene ug/l	1,3-Dichloro-benzene ug/l	1,4-Dichloro-benzene ug/l	1,1-Dichloro-ethane ug/l	1,2-Dichloro-ethane ug/l	1,1-Dichloro-ethene ug/l	trans-1,2-Di-chloroethene ug/l	1,2-Dichloro-propane ug/l
)2A	601\602		04/22/86	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
12A	8010/8020		03/02/89	<0.5	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.5
13B	601\602		04/22/86	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
13B	8010/8020		03/07/89	<0.5	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.5
14A	601\602		04/22/86	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
14A	8010/8020		03/03/89	<0.5	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.5
4B	601\602		04/22/86	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
4B	8010/8020		03/03/89	<0.5	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.5
5A	601\602		04/22/86	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
5A	8010/8020		03/05/89	<0.5	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.5
5B	601\602		04/22/86	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
6A	601\602		04/23/86	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
6A	8010/8020		03/03/89	<0.5	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.5
6B	601\602		04/21/86	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
6B	601\602	FDUPE MX-16B	04/29/86	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

lo. 2
89

Table 4-4 (cont)
Southern Pacific Transportation Company (Bayshore Yard)
Ground Water Organics Analyses
Report form # 2

le er	Test Method	QAQC Identification	Date Sampled	Dibromochloro-methane ug/l	1,2-Dichloro-benzene ug/l	1,3-Dichloro-benzene ug/l	1,4-Dichloro-benzene ug/l	1,1-Dichloro-ethane ug/l	1,2-Dichloro-ethane ug/l	1,1-Dichloro-ethene ug/l	trans-1,2-Di-chloroethene ug/l	1,2-Dichloro-propane ug/l
	8010/8020		03/03/89	<0.5	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.5
\	601\602		06/19/86	<0.1	<0.1	<0.1	<0.1	0.1	<0.1	<0.1	<0.1	<0.1
\	8010/8020		03/07/89	<0.5	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.5
B	601\602		06/19/86	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
B	8010/8020		03/07/89	<0.5	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.5
B	8010/8020	FDUPE MK-09B	03/07/89	<0.5	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.5
'A	601\602	FDUPE-MK02-A	04/22/86	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
IB	8010/8020		03/03/89	<0.5	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.5
IB	601\602		04/24/86	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
IB	8010/8020		02/26/89	<0.5	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.5
2B	601\602		04/22/86	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2B	8010/8020		03/02/89	<0.5	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.5

Table 4-4 (cont)
Southern Pacific Transportation Company (Bayshore Yard)
Ground Water Organics Analyses
Report Form # 2

Sample Number	Test Method	QAQC Identification	Date Sampled	Dibromochloro-methane ug/l	1,2-Dichloro-benzene ug/l	1,3-Dichloro-benzene ug/l	1,4-Dichloro-benzene ug/l	1,1-Dichloro-ethane ug/l	1,2-Dichloro-ethane ug/l	1,1-Dichloro-ethene ug/l	trans-1,2-Di-chloroethene ug/l	1,2-Dichloro propane ug/l
-03A	601\602		04/22/86	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
-03A	8010/8020		03/07/89	<0.5	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.5
I-04A	601\602		04/22/86	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
I-04A	8010/8020		03/05/89	<25	<100	<50	<50	<50	<50	<50	<50	<25
J-05A	601\602		04/17/86	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
J-05A	601\602		06/30/86	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	830	<0.1
J-05A	5030/8020		03/09/89	- -	- -	- -	- -	- -	- -	- -	- -	- -
W-05B	601\602		04/17/86	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
W-05B	601\602		06/30/86	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
W-05B	5030/8010		03/09/89	<5.0	<20	<10	<10	<10	<10	<10	<10	<5.0
W-05B	5030/8020		03/09/89	- -	- -	- -	- -	- -	- -	- -	- -	- -
W-06A	601\602		04/17/86	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	59	<0.1
W-06A	8010/8020		03/05/89	<25	<100	<50	<50	<50	<50	<50	790	<25
W-06B	601\602		04/17/86	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
W-06B	8010/8020		03/05/89	<0.5	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.5
W-07A	601\602		04/17/86	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	632.9	<0.1
W-08A	601\602		04/17/86	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	640	<0.1
W-08A	801		03/05/89	<25	<100	<5	<50	<50	<50	<50	98C	<25
	-08/8		/05/8	<0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.5

Table 4-4 (cont)
Southern Pacific Transportation Company (Bayshore Yard)
Ground Water Organics Analyses
Report Form # 3

Sample Number	Test Method	QAQC Identification	Date Sampled	cis-1,3 Dichloro-propylene ug/l	trans-1,3-Dichloro-propylene ug/l	Ethyl Benzene ug/l	Methylene chloride ug/l	1,1,2,2-Tetra-chloroethane ug/l	Tetrachloro-ethylene ug/l	Toluene ug/l	1,1,1-Tri-chloroethane ug/l	1,1,2-Tri-chloroethane ug/l
K-02A	601\602		04/22/86	<0.1	<0.1	<0.1	<10	<0.5	<0.5	<0.2	<0.1	<0.1
K-02A	8010/8020		03/02/89	<0.5	<5.0	<0.5	<2.0	<0.5	<1.0	<0.5	<0.5	<0.5
K-03B	601\602		04/22/86	<0.1	<0.1	<0.1	<10	<0.5	<0.5	<0.2	<0.1	<0.1
K-03B	8010/8020		03/07/89	<0.5	<5.0	<0.5	<2.0	<0.5	<0.5	<0.5	<0.5	<0.5
K-04A	601\602		04/22/86	<0.1	<0.1	0.5	<10	<0.5	<0.5	1.2	<0.1	<0.1
K-04A	8010/8020		03/03/89	<0.5	<5.0	<0.5	<2.0	<0.5	<0.5	<0.5	<0.5	<0.5
K-04B	601\602		04/22/86	<0.1	<0.1	<0.1	<10	<0.5	<0.5	<0.2	<0.1	<0.1
K-04B	8010/8020		03/03/89	<0.5	<5.0	<0.5	<2.0	<0.5	<0.5	<0.5	<0.5	<0.5
K-05A	601\602		04/22/86	<0.1	<0.1	<0.1	500	<0.5	<0.5	<0.2	<0.1	<0.1
K-05A	8010/8020		03/05/89	<0.5	<5.0	<0.5	3.0	<0.5	<0.5	<0.5	<0.5	<0.5
K-05B	601\602		04/22/86	<0.1	<0.1	<0.1	<10	<0.5	<0.5	<0.2	<0.1	<0.1
K-06A	601\602		04/23/86	<0.1	<0.1	<0.1	<10	<0.5	<0.5	<0.2	<0.1	<0.1
K-06A	8010/8020		03/03/89	<0.5	<5.0	<0.5	<2.0	<0.5	<0.5	<0.5	<0.5	<0.5
K-06B	601\602		04/21/86	<0.1	<0.1	<0.1	<10	<0.5	<0.5	<0.2	<0.1	<0.1
K-06B	601\602	FDUPE MK-16B	04/29/86	<0.1	<0.1	<0.1	<10	<0.5	<0.5	<0.2	<0.1	<0.1

Table 4-4 (cont)
Southern Pacific Transportation Company (Bayshore Yard)
Ground Water Organics Analyses
Report Form # 3

Sample Number	Test Method	QAQC Identification	Date Sampled	cis-1,3 Dichloro-propylene ug/l	trans-1,3-Dichloro-propylene ug/l	Ethyl Benzene ug/l	Methylene chloride ug/l	1,1,2,2-Tetra-chloroethane ug/l	Tetrachloro-ethylene ug/l	Toluene ug/l	1,1,1-Tri-chloroethane ug/l	1,1,2-Tri-chloroethane ug/l
MK-06B	8010/8020		03/03/89	<0.5	<5.0	<0.5	<2.0	<0.5	<0.5	<0.5	<0.5	<0.5
MK-09A	601\602		06/19/86	<0.1	<0.1	<0.1	<10	<0.5	<0.5	<0.2	<0.1	<0.1
MK-09A	8010/8020		03/07/89	<0.5	<5.0	<0.5	<2.0	<0.5	<0.5	<0.5	<0.5	<0.5
MK-09B	601\602		06/19/86	<0.1	<0.1	0.1	<10	<0.5	<0.5	<0.2	<0.1	<0.1
MK-09B	8010/8020		03/07/89	<0.5	<5.0	<0.5	<2.0	<0.5	<0.5	<0.5	<0.5	<0.5
MK-09B	8010/8020	FDUPE MK-09B	03/07/89	<0.5	<5.0	<0.5	<2.0	<0.5	<0.5	<0.5	<0.5	<0.5
MK-22A	601\602	FDUPE-MK02-A	04/22/86	<0.1	<0.1	<0.1	<10	<0.5	<0.5	<0.2	<0.1	<0.1
MW-02B	601\602		04/22/86	<0.1	<0.1	0.4	<10	<0.5	<0.5	<0.2	<0.1	<0.1
MW-02B	8020		03/02/89	<0.5	<5.0	<0.5	<2.0	<0.5	<0.5	<0.5	<0.5	<0.5

No. 3
./89

Table 4-4 (cont)
Southern Pacific Transportation Company (Bayshore Yard)
Ground Water Organics Analyses
Report Form # 3

ple ber	Test Method	OAOC Identification	Date Sampled	cis-1,3 Dichloro-propylene ug/l	trans-1,3-Dichloro-propylene ug/l	Ethyl Benzene ug/l	Methylene chloride ug/l	1,1,2,2-Tetra-chloroethane ug/l	Tetrachloro-ethylene ug/l	Toluene ug/l	1,1,1-Tri-chloroethane ug/l	1,1,2-Tri-chloroethane ug/l
3A	601\602		04/22/86	<0.1	<0.1	0.5	<10	<0.5	<0.5	0.9	<0.1	<0.1
5A	8010/8020		03/07/89	<0.5	<5.0	<0.5	<2.0	<0.5	<0.5	<0.5	<0.5	<0.5
4A	601\602		04/22/86	<0.1	<0.1	<0.1	<10	<0.5	<0.5	<0.2	<0.1	<0.1
4A	8010/8020		03/05/89	<25	<250	<25	<100	<25	<25	<25	<25	<25
5A	601\602		04/17/86	<0.1	<0.1	<0.1	<10	<0.5	48000	<0.2	<0.1	<0.1
5A	601\602		06/30/86	<0.1	<0.1	<0.1	<10	<0.5	8700	<0.2	47	130
5A	5030/8020		03/09/89	- -	- -	<0.5	- -	- -	- -	<0.5	- -	
5B	601\602		04/17/86	<0.1	0.20	<0.1	<10	<0.5	<0.5	0.2	<0.1	<0.1
5B	601\602		06/30/86	<0.1	<0.1	<0.1	<10	<0.5	<0.5	<0.2	<0.1	<0.1
5B	5030/8010		03/09/89	<5.0	<50	- -	<20	<5.0	<5.0	- -	<5.0	<5.0
5B	5030/8020		03/09/89	- -	- -	<0.5	- -	- -	- -	<0.5	- -	- -
6A	601\602		04/17/86	<0.1	<0.1	0.10	<10	<0.5	6.0	<0.2	<0.1	<0.1
6A	8010/8020		03/05/89	<25	<250	<25	<100	<25	150	<25	<25	<25
6B	601\602		04/17/86	<0.1	<0.1	<0.1	<10	<0.5	3.1	<0.2	<0.1	<0.1
6B	8010/8020		03/05/89	<0.5	<5.0	<0.5	5.0	<0.5	1.9	<0.5	<0.5	<0.5
7A	601\602		04/17/86	<0.1	<0.1	<0.1	<10	1.8	76	0.6	<0.1	<0.1
8A	601\602		04/17/86	<0.1	<0.1	<0.1	<10	<0.5	<0.5	<0.2	<0.1	<0.1
8A	8010/8020		03/05/89	<25	<250	<25	<100	<25	<25	<25	<25	<25
8B	8010/8020		03/05/89	<0.5	<5.0	<0.5	<2.0	<0.5	<0.5	<0.5	<0.5	<0.5

Table 4-4 (cont)
Southern Pacific Transportation Company (Bayshore Yard)
Ground Water Organics Analyses
Report Form # 4

Sample Number	Test Method	QAQC Identification	Date Sampled	Trichloro-ethylene ug/l	Trichloro-fluormethane ug/l	Vinyl Chloride ug/l	Total Xylene ug/l	Total Petroleum Hydrocarbons mg/l
MK-02A	601\602		04/22/86	<0.1	<0.1	<0.1	<0.1	- -
MK-02A	8010/8020		03/02/89	<0.5	<1.0	<2.0	<0.5	- -
MK-03B	601\602		04/22/86	<0.1	<0.1	<0.1	0.6	- -
MK-03B	8010/8020		03/07/89	<0.5	<1.0.	<2.0	<0.5	- -
MK-04A	601\602		04/22/86	<0.1	<0.1	<0.1	3.8	- -
MK-04A	8010/8020		03/03/89	<0.5	<1.0	<2.0	<0.5	- -
MK-04B	601\602		04/22/86	1	<0.1	<0.1	<0.1	- -
MK-04B	8010/8020		03/03/89	<0.5	<1.0	<2.0	<0.5	- -
MK-05A	601\602		04/22/86	<0.1	<0.1	<0.1	<0.1	- -
MK-05A	8010/8020		03/05/89	<0.5	<1.0	<2.0	<0.5	- -
MK-05B	601\602		04/22/86	<0.1	<0.1	<0.1	<0.1	- -
MK-06A	601\602		04/23/86	<0.1	<0.1	<0.1	<0.1	- -
MK-06A	8010/8020		03/03/89	<0.5	<1.0	<2.0	<0.5	- -
MK-06B	601\602		04/21/86	<0.1	<0.1	<0.1	<0.1	- -
MK-06B	601\602	FDUPE MK-16B	04/29/86	<0.1	<0.1	<0.1	<0.1	- -

Table 4-4 (cont)
Southern Pacific Transportation Company (Bayshore Yard)
Ground Water Organics Analyses
Report Form # 4

Sample Number	Test Method	QAQC Identification	Date Sampled	Trichloro-ethylene ug/l	Trichloro-fluoromethane ug/l	Vinyl Chloride ug/l	Total Xylene ug/l	Total Petroleum Hydrocarbons mg/l
MK-06B	8010/8020		03/03/89	<0.5	<1.0	<2.0	<0.5	- -
MK-09A	601\602		06/19/86	<0.1	<0.1	<0.1	<0.1	- -
MK-09A	8010/8020		03/07/89	<0.5	<1.0	<2.0	<0.5	- -
MK-09B	601\602		06/19/86	<0.1	<0.1	<0.1	0.8	- -
MK-09B	8010/8020		03/07/89	<0.5	<1.0	<2.0	<0.5	- -
MK-09B	8010/8020	FDUPE MK-09B	03/07/89	<0.5	<1.0	<2.0	<0.5	- -
MK-22A	601\602	FDUPE-MK02-A	04/22/86	15	<0.1	<0.1	2.3	- -
MW-02B	601\602		04/22/86	<0.1	<0.1	<0.1	1.6	- -
MW-02B	8010/8020		03/02/89	<0.5	<1.0	<2.0	<0.5	- -

05/14/89

Table 4-4 (cont)
Southern Pacific Transportation Company (Bayshore Yard)
Ground Water Organics Analyses
Report Form # 4

Sample Number	Test Method	OAQC Identification	Date Sampled	Trichloro-ethylene ug/l	Trichloro-fluormethane ug/l	Vinyl Chloride ug/l	Total Xylene ug/l	Total Petroleum Hydrocarbons mg/l
MW-03A	601\602		04/22/86	<0.1	<0.1	<0.1	3.2	- -
MW-03A	8010/8020		03/07/89	<0.5	<1.0	<2.0	<0.5	- -
MW-04A	601\602		04/22/86	<0.1	<0.1	<0.1	<0.1	- -
MW-04A	8010/8020		03/05/89	1100	<50	<100	<25	- -
MW-05A	601\602		04/17/86	1000000	<0.1	<0.1	<0.1	- -
MW-05A	601\602		06/30/86	140000	<0.1	<0.1	<0.1	- -
MW-05A	5030/8020		03/09/89	- -	- -	- -	<0.5	- -
MW-05B	601\602		04/17/86	44	<0.1	<0.1	<0.1	- -
MW-05B	601\602		06/30/86	7	<0.1	<0.1	<0.1	- -
MW-05B	5030/8010		03/09/89	110	<10	<20	- -	- -
MW-05B	5030/8020		03/09/89	-	- -	- -	<0.5	- -
MW-06A	601\602		04/17/86	79	<0.1	<0.1	<0.1	- -
MW-06A	8010/8020		03/05/89	2100	<50	<100	<25	- -
MW-06B	601\602		04/17/86	18	<0.1	<0.1	<0.1	- -
MW-06B	8010/8020		03/05/89	43	<1.0	<2.0	<0.5	- -
MW-07A	601\602		04/17/86	340	<0.1	<0.1	<0.1	- -
MW-08A	601\602		04/17/86	<0.1	<0.1	<0.1	<0.1	- -
MW-08A	8010/8020		03/05/89	<25	<5	<100	<25	- -
MW-08B	8010/8020		03/05/89	<0.5	<1.0	<2.0	<0.5	- -

REMEDIAL INVESTIGATION
DATA STUDY REPORT

for

SOUTHERN PACIFIC TRANSPORTATION COMPANY
BAYSHORE FACILITY
BRISBANE, CALIFORNIA

HCI-705

May 16, 1989

HCI HYDROLOGIC CONSULTANTS, INC.

12596 W. Bayaud Avenue • Suite 290 • Lakewood, CO 80228
TEL: (303) 969-8033 • FAX: (303) 969-8357

260 Russell Blvd. • Suite B • Davis, CA 95616
TEL: (916) 756-0925 • FAX: (916) 756-9230

6.0 SUMMARY OF EXTENT OF CONTAMINATION AND POTENTIAL HEALTH AND ENVIRONMENTAL IMPACTS

6.1 CONTAMINANT DISTRIBUTIONS IN SOIL AND GROUND WATER

The distribution of metal and organic contaminants in soils and ground water was discussed in detail in Section 4.0. Detailed maps of the metals and volatile organic compounds were constructed and presented in Appendix B. Review of the maps of soil metals concentrations indicates that most of the metals analyzed show an essentially random distribution of areas of high concentrations throughout the Bayshore Facility. This pattern is even more pronounced if only the qualified data are considered, but this is partially an artifact of the sparse distribution of qualified sample locations (i.e., the MARK samples). Furthermore, most of the metals concentration distributions observed strongly indicate that they are probably associated with the random distribution of metal debris in the fill rather than a contaminant source associated with a past SPTCo practice.

The metals Cu, Pb, Zn, and possibly Cr do appear to be elevated in locations where past operations would likely have utilized and disposed of metallic compounds. All four of these metals appear to be significantly elevated in the south disposal area and moderately elevated in the turntable and former oil tank locations. Moderate concentrations also occur in localized areas near the former Freight Car Repair Shop.

The distribution of metals concentrations in both the A- and B-zone ground water showed an even more random pattern than soils distributions. Zinc and barium appeared to show some consistently elevated concentrations in A-zone ground water in the south disposal site and former oil tank locations, but the disparity in concentrations values obtained by MARK and SSP&A was significant. Another sampling event in which QA/QC protocols are strictly followed and the analyses results are validated will allow a better definition of the actual concentrations of metals in ground water at the Site.

The distributions of volatile organic compounds in soils was shown to be limited to the northern area of the Site. In this area, the highest total concentrations of volatile organics (chlorinated solvents) which were found were less than 0.6 mg/kg.

The distributions of volatile organics in ground water are very high in the A-zone (>1000 mg/l), and moderately high (>5 mg/l) in the B-zone ground water in the northern area of the Site. This observation has been consistent between analyses of several investigators. Some results showing low (<20 ug/l) BTX compounds have been reported in A-zone wells around the turntable. However, the results obtained by SSP&A did not agree well with the results obtained by MARK. Again, a future sampling in which strict QA/QC and validation procedures are followed should more clearly define the extent of BTX concentrations in ground water in this area.

Measurements of total petroleum hydrocarbons indicated that hydrocarbons exist in soil and ground water in the areas around the former oil tank and turntable. However, these measurements did not reflect the magnitude of the oil/fuel contamination in the A-zone which has been observed during drilling and trenching operations by E&E and MARK. It is possible that the screened intervals of some of the shallow wells are not allowing the floating fuel layer to enter the well during sampling, and thus that TPH compounds are not being collected in the samples. However, regardless of the analyzed fuel/oil constituent concentrations, a floating layer of oil has been shown to exist in this general area, and future investigations should be targeted at more accurately defining the extent of this problem.

6.2 PRELIMINARY PUBLIC HEALTH AND ENVIRONMENTAL EVALUATION

A preliminary assessment of the potential risks posed to public health and the environment was made based on partially qualified concentrations of metals and volatile organics which have been observed in soils and ground water at the Site. The pathways of human exposure considered in the risk assessment were inhalation of volatile emissions from contaminated soils, inhalation of metals contaminated

Table 4-1
Southern Pacific Transportation Company (Bayshore Yard)
Soil Metals Analyses
Report Form #1

Sample Number	QA/QC Identification	Lab Code	Date Sampled	Top Depth (ft\msl)	Bottom Depth (ft\msl)	Arsenic mg/kg	Barium mg/kg	Chromium III mg/kg	Chromium VI (Hexavalent) mg/kg	Total Chromium mg/kg	Copper mg/kg	Lead mg/kg	Zinc mg/kg
MK1A	FDUPE-MK19A-01	CCA	01/15/86	1.5	2.0	0.78	170	- -	- -	0.34	18	17	60
MK1A-01		CCA	01/15/86	1.5	2.0	<0.1	250	- -	- -	0.2	7.8	5.0	50
MK1A-02		CCA	01/15/86	3.5	4.0	<0.1	200	- -	- -	0.2	2.0	6.8	30
MK1A-02	FDUPE-MK19A-02	CCA	01/15/86	3.5	4.0	<0.1	250	- -	- -	0.2	2.7	6.9	30
MK2A-01		CCA	01/13/86	1.5	2.0	<0.1	46	- -	- -	8.9	15	6.0	70
MK2A-03		CCA	01/13/86	6.0	6.5	17	31	- -	- -	8.9	1.4	1.0	13
MK3A-01	FDUPE-MK2A-01	CCA	01/13/86	1.5	2.0	0.2	60	- -	- -	16	20	5.2	50
MK3B-01		CCA	01/20/86	1.0	1.5	26.0	<1	- -	- -	4.0	85	3.8	40
MK3B-02		CCA	01/20/86	6.0	6.5	2.9	25	- -	- -	25	300	1100	270
MK3B-05		CCA	01/20/86	21.0	21.5	0.63	8	- -	- -	40	17	5	45
MK4B-01		CCA	01/22/86	1.5	2.0	120	220	18	<0.5	- -	220	900	480
MK4B-04		CCA	01/22/86	11.0	11.5	0.54	50	28	<0.5	- -	16	6.8	30
MK4B-06		CCA	01/22/86	21.0	21.5	0.87	50	25	<0.5	- -	17	6.8	30
MK4B-07		CCA	01/22/86	26.0	26.5	0.38	15	30	<0.5	- -	25	0.7	20
MK5B-01		CCA	01/20/86	1.5	2.0	2.1	<1	- -	- -	9.2	45	75	120
MK5B-01	FDUPE-MK15B-01	CCA	01/20/86	1.5	2.0	1.0	<1	- -	- -	15	75	170	140
MK5B-03		CCA	01/20/86	6.0	6.5	0.66	<1	- -	- -	12	55	120	75

Table 4-1
Southern Pacific Transportation Company (Bayshore Yard)
Soil Metals Analyses
Report Form #1

Sample Number	QAQC Identification	Lab Code	Date Sampled	Top Depth (ft\msl)	Bottom Depth (ft\msl)	Arsenic mg/kg	Barium mg/kg	Chromium III mg/kg	Chromium VI (Hexavalent) mg/kg	Total Chromium mg/kg	Copper mg/kg	Lead mg/kg	Zinc mg/kg
MK5B-06		CCA	01/20/86	21.0	21.5	1.0	13	- -	- -	35	4.1	1.9	12
MK6B-01	FDUPE-MK16B-01	CCA	01/21/86	1.5	2.0	12	20	- -	- -	11	75	130	90
MK6B-01		CCA	01/21/86	1.5	2.0	20	35	- -	- -	70	25	6.9	50
MK6B-04		CCA	01/21/86	11.0	11.5	2.4	20	- -	- -	18	160	6.1	75
MK6B-05		CCA	01/21/86	16.0	16.5	2.9	7.6	- -	- -	33	18	5.7	40
MK6B-09		CCA	01/21/86	36.0	36.5	4.0	11	- -	- -	35	25	5.8	60
MK7B-01		CCA	01/23/86	1.5	2.0	0.9	25	14	<0.5	- -	12	3.8	20
MK7B-02		CCA	01/23/86	3.5	4.0	1.2	<1	20	<0.5	- -	820	3800	1800
MK7B-09		CCA	01/23/86	36.0	36.5	1.6	70	30	<0.5	- -	25	5.2	30
MK8A-01		CCA	01/15/86	1.5	2.0	1.3	110	- -	- -	4.2	25	800	140
MK8A-02		CCA	01/15/86	3.5	4.0	0.7	460	- -	- -	55	4100	7800	2300
MK9B-01		CCA	06/12/86	1.5	2.0	0.5	51	- -	- -	18	13	12	33
MB02(2-1)	EPA-3050	CCA	08/12/86	11.0	11.5	3.5	75	- -	- -	- -	15	24	65
MB05(2)	EPA-3050	CCA	08/12/86	6.0	6.5	- -	50	- -	- -	- -	75	180	80
MB08A(2)	EPA-3050	CCA	08/12/86	3.5	4.0	- -	140	- -	- -	- -	90	1600	530
MB1-01		CCA	12/09/85	1.5	2.0	0.49	40	4.5	<0.5	- -	45	40	50
MB1-02		CCA	12/09/85	3.5	4.0	2.1	36	28	<0.5	- -	25	20	180
MB1-05		CCA	12/09/85	16.0	16.5	0.86	50	60	<0.5	- -	7.2	4.3	22

Table 4-1
Southern Pacific Transportation Company (Bayshore Yard)
Soil Metals Analyses
Report Form #1

Sample Number	QAQC Identification	Lab Code	Date Sampled	Top Depth (ft\msl)	Bottom Depth (ft\msl)	Arsenic mg/kg	Barium mg/kg	Chromium III mg/kg	Chromium VI (Hexavalent) mg/kg	Total Chromium mg/kg	Copper mg/kg	Lead mg/kg	Zinc mg/kg
MB10-01		CCA	12/16/85	1.5	2.0	<0.1	50	8.3	<0.5	- -	100	340	1500
MB10-03		CCA	12/16/85	6.0	6.5	<0.1	2.0	<0.5	<0.5	- -	0.9	0.4	40
MB10-07		CCA	12/16/85	26.0	26.5	<0.1	20	12	<0.5	- -	2.5	0.7	8.2
MB11-01		CCA	12/18/85	1.5	2.0	3.1	170	5.8	<0.5	- -	92	85	75
MB11-03		CCA	12/18/85	6.0	6.5	3.5	60	30	<0.5	- -	12	20	38
MB11-07		CCA	12/18/85	31.0	31.5	0.23	20	120	<0.5	- -	3.3	2.0	9.5
MB12-01		CCA	12/16/85	1.5	2.0	0.37	38	7.9	<0.5	- -	5.8	3.4	9.1
MB12-02		CCA	12/16/85	3.5	4.0	<0.1	85	7.4	<0.5	- -	9.8	4.4	15
MB12-07		CCA	12/16/85	26.0	26.5	<0.1	13	25	<0.5	- -	2.2	1.3	6.3
MB2-01		CCA	12/09/85	1.0	1.5	0.66	55	12	<0.5	- -	530	550	80
MB2-03		CCA	12/09/85	11.0	11.5	70	90	12	<0.5	- -	340	750	170
MB2-06		CCA	12/09/85	26.0	26.5	1.6	6.5	20	<0.5	- -	5.4	2.3	13
MB3-01		CCA	12/10/85	1.0	1.5	3	24	5.8	<0.5	- -	85	50	45
MB3-04		CCA	12/10/85	16.0	16.5	5	6	45	<0.5	- -	20	7.6	55
MB3-11		CCA	12/10/85	51.0	51.5	0.88	50	45	<0.5	- -	6.6	4.6	25
MB4-01		CCA	12/11/85	1.5	2.0	2.2	37	25	<0.5	- -	230	250	850
MB4-02		CCA	12/11/85	2.5	3.0	7.0	110	17	<0.5	- -	150	290	830
MB4-13		CCA	12/11/85	56.0	56.5	0.62	33	30	<0.5	- -	16	6	27

Table 4-1
Southern Pacific Transportation Company (Bayshore Yard)
Soil Metals Analyses
Report Form #1

Sample Number	QAQC Identification	Lab Code	Date Sampled	Top Depth (ft\msl)	Bottom Depth (ft\msl)	Arsenic mg/kg	Barium mg/kg	Chromium III mg/kg	Chromium VI (Hexavalent) mg/kg	Total Chromium mg/kg	Copper mg/kg	Lead mg/kg	Zinc mg/kg
MB5-01		CCA	12/11/85	1.5	2.0	3.3	65	22	<0.5	- -	530	275	660
MB5-03		CCA	12/11/85	6.0	6.5	1.1	140	30	<0.5	- -	550	5700	2200
MB5-11		CCA	12/11/85	46.0	46.5	0.58	120	35	<0.5	- -	16	7.8	43
MB6-01		CCA	12/13/85	1.0	1.5	1.8	<1	45	<0.5	- -	1000	4100	3400
MB6-02		CCA	12/13/85	3.5	4.0	2.0	20	15	<0.5	- -	500	1300	780
MB6-11		CCA	12/13/85	46.0	46.5	<0.1	100	4.6	<0.5	- -	6.4	2.3	30
MB6-12		CCA	12/13/85	51.0	51.5	1.1	70	50	<0.5	- -	20	7.2	50
MB7-01		CCA	12/13/85	1.5	2.0	0.81	600	28	<0.5	- -	600	16000	2500
MB7-03		CCA	12/13/85	6.0	6.5	1.4	170	7.2	<0.5	- -	550	850	390
MB7-08		CCA	12/13/85	31.0	31.5	0.77	45	40	<0.5	- -	11	9.7	50
MB8-01		CCA	12/13/85	1.5	2.0	0.33	17	8.2	<0.5	- -	12	90	33
MB8-02		CCA	12/13/85	3.5	4.0	0.67	30	6.0	<0.5	- -	20	95	50
MB8-09		CCA	12/13/85	36.0	36.5	2.0	25	20	<0.5	- -	8	3.4	38
MB9-01		CCA	12/17/85	1.5	2.0	<0.1	<1	6.8	<0.5	- -	1.0	<0.10	0.40
MB9-02		CCA	12/17/85	3.5	4.0	<0.1	15.0	21	<0.5	- -	35	25	65
MB9-10		CCA	12/17/85	46.0	46.5	<0.1	19	9.7	<0.5	- -	2.5	1.0	9.0
MW-08A	FDUPE-MK18A-01	CCA	01/15/86	1.5	2.0	<0.1	<1	- -	- -	10	100	17	800
MW-08A	FDUPE-MK18A-02	CCA	01/15/86	3.5	4.0	<0.1	120	- -	- -	1.3	900	1400	290

Table 4-1
Southern Pacific Transportation Company (Bayshore Yard)
Soil Metals Analyses
Report Form #1

Sample Number	QA/QC Identification	Lab Code	Date Sampled	Top Depth (ft\msl)	Bottom Depth (ft\msl)	Arsenic mg/kg	Barium mg/kg	Chromium III mg/kg	Chromium VI (Hexavalent) mg/kg .	Total Chromium mg/kg	Copper mg/kg	Lead mg/kg	Zinc mg/kg
MD-01		CCA	01/23/86	0.0	0.0	8.4	17	14	<0.5	- -	5700	2900	1700
MD-02		CCA	01/23/86	0.0	0.0	23	25	14	<0.5	- -	50	70	75
MD-03		CCA	01/23/86	0.0	0.0	1.7	32	17	<0.5	- -	550	1400	590
MD-04		CCA	01/23/86	0.0	0.0	4.7	19	13	<0.5	- -	120	400	115

Table 4-1
Southern Pacific Transportation Company (Bayshore Yard)
Soil Metals Analyses
Report Form #1

Sample Number	QA/QC Identification	Lab Code	Date Sampled	Top Depth (ft\msl)	Bottom Depth (ft\msl)	Arsenic mg/kg	Barium mg/kg	Chromium III mg/kg	Chromium VI (Hexavalent) mg/kg	Total Chromium mg/kg	Copper mg/kg	Lead mg/kg	Zinc mg/kg
MK1A	FDUPE-MK19A-01	CCA	01/15/86	1.5	2.0	0.78	170	- -	- -	0.34	18	17	60
MK1A-01		CCA	01/15/86	1.5	2.0	<0.1	250	- -	- -	0.2	7.8	5.0	50
MK1A-02		CCA	01/15/86	3.5	4.0	<0.1	200	- -	- -	0.2	2.0	6.8	30
MK1A-02	FDUPE-MK19A-02	CCA	01/15/86	3.5	4.0	<0.1	250	- -	- -	0.2	2.7	6.9	30
MK2A-01		CCA	01/13/86	1.5	2.0	<0.1	46	- -	- -	8.9	15	6.0	70
MK2A-03		CCA	01/13/86	6.0	6.5	17	31	- -	- -	8.9	1.4	1.0	13
MK3A-01	FDUPE-MK2A-01	CCA	01/13/86	1.5	2.0	0.2	60	- -	- -	16	20	5.2	50
MK3B-01		CCA	01/20/86	1.0	1.5	26.0	<1	- -	- -	4.0	85	3.8	40
MK3B-02		CCA	01/20/86	6.0	6.5	2.9	25	- -	- -	25	300	1100	270
MK3B-05		CCA	01/20/86	21.0	21.5	0.63	8	- -	- -	40	17	5	45
MK4B-01		CCA	01/22/86	1.5	2.0	120	220	18	<0.5	- -	220	900	480
MK4B-04		CCA	01/22/86	11.0	11.5	0.54	50	28	<0.5	- -	16	6.8	30
MK4B-06		CCA	01/22/86	21.0	21.5	0.87	50	25	<0.5	- -	17	6.8	30
MK4B-07		CCA	01/22/86	26.0	26.5	0.38	15	30	<0.5	- -	25	0.7	20
MK5B-01		CCA	01/20/86	1.5	2.0	2.1	<1	- -	- -	9.2	45	75	120
MK5B-01	FDUPE-MK15B-01	CCA	01/20/86	1.5	2.0	1.0	<1	- -	- -	15	75	170	140
MK5B-03		CCA	01/20/86	6.0	6.5	0.66	<1	- -	- -	12	55	120	75

Table 4-1
Southern Pacific Transportation Company (Bayshore Yard)
Soil Metals Analyses
Report Form #1

Sample Number	QAQC Identification	Lab Code	Date Sampled	Top Depth (ft\msl)	Bottom Depth (ft\msl)	Arsenic mg/kg	Barium mg/kg	Chromium III mg/kg	Chromium VI (Hexavalent) mg/kg	Total Chromium mg/kg	Copper mg/kg	Lead mg/kg	Zinc mg/kg
MK5B-06		CCA	01/20/86	21.0	21.5	1.0	13	- -	- -	35	4.1	1.9	12
MK6B-01	FDUPE-MK16B-01	CCA	01/21/86	1.5	2.0	12	20	- -	- -	11	75	130	90
MK6B-01		CCA	01/21/86	1.5	2.0	20	35	- -	- -	70	25	6.9	50
MK6B-04		CCA	01/21/86	11.0	11.5	2.4	20	- -	- -	18	160	6.1	75
MK6B-05		CCA	01/21/86	16.0	16.5	2.9	7.6	- -	- -	33	18	5.7	40
MK6B-09		CCA	01/21/86	36.0	36.5	4.0	11	- -	- -	35	25	5.8	60
MK7B-01		CCA	01/23/86	1.5	2.0	0.9	25	14	<0.5	- -	12	3.8	20
MK7B-02		CCA	01/23/86	3.5	4.0	1.2	<1	20	<0.5	- -	820	3800	1800
MK7B-09		CCA	01/23/86	36.0	36.5	1.6	70	30	<0.5	- -	25	5.2	30
MK8A-01		CCA	01/15/86	1.5	2.0	1.3	110	- -	- -	4.2	25	800	140
MK8A-02		CCA	01/15/86	3.5	4.0	0.7	460	- -	- -	55	4100	7800	2300
MK9B-01		CCA	06/12/86	1.5	2.0	0.5	51	- -	- -	18	13	12	33
MB02(2-1)	EPA-3050	CCA	08/12/86	11.0	11.5	3.5	75	- -	- -	- -	15	24	65
MB05(2)	EPA-3050	CCA	08/12/86	6.0	6.5	- -	50	- -	- -	- -	75	180	80
MB08A(2)	EPA-3050	CCA	08/12/86	3.5	4.0	- -	140	- -	- -	- -	90	1600	530
MB1-01		CCA	12/09/85	1.5	2.0	0.49	40	4.5	<0.5	- -	45	40	50
MB1-02		CCA	12/09/85	3.5	4.0	2.1	36	28	<0.5	- -	25	20	180
MB1-05		CCA	12/09/85	16.0	16.5	0.86	50	60	<0.5	- -	7.2	4.3	22

Table 4-1
Southern Pacific Transportation Company (Bayshore Yard)
Soil Metals Analyses
Report Form #1

Sample Number	QAQC Identification	Lab Code	Date Sampled	Top Depth (ft\msl)	Bottom Depth (ft\msl)	Arsenic mg/kg	Barium mg/kg	Chromium III mg/kg	Chromium VI (Hexavalent) mg/kg	Total Chromium mg/kg	Copper mg/kg	Lead mg/kg	Zinc mg/kg
MB10-01		CCA	12/16/85	1.5	2.0	<0.1	50	8.3	<0.5	- -	100	340	1500
MB10-03		CCA	12/16/85	6.0	6.5	<0.1	2.0	<0.5	<0.5	- -	0.9	0.4	40
MB10-07		CCA	12/16/85	26.0	26.5	<0.1	20	12	<0.5	- -	2.5	0.7	8.2
MB11-01		CCA	12/18/85	1.5	2.0	3.1	170	5.8	<0.5	- -	92	85	75
MB11-03		CCA	12/18/85	6.0	6.5	3.5	60	30	<0.5	- -	12	20	38
MB11-07		CCA	12/18/85	31.0	31.5	0.23	20	120	<0.5	- -	3.3	2.0	9.5
MB12-01		CCA	12/16/85	1.5	2.0	0.37	38	7.9	<0.5	- -	5.8	3.4	9.1
MB12-02		CCA	12/16/85	3.5	4.0	<0.1	85	7.4	<0.5	- -	9.8	4.4	15
MB12-07		CCA	12/16/85	26.0	26.5	<0.1	13	25	<0.5	- -	2.2	1.3	6.3
MB2-01		CCA	12/09/85	1.0	1.5	0.66	55	12	<0.5	- -	530	550	80
MB2-03		CCA	12/09/85	11.0	11.5	70	90	12	<0.5	- -	340	750	170
MB2-06		CCA	12/09/85	26.0	26.5	1.6	6.5	20	<0.5	- -	5.4	2.3	13
MB3-01		CCA	12/10/85	1.0	1.5	3	24	5.8	<0.5	- -	85	50	45
MB3-04		CCA	12/10/85	16.0	16.5	5	6	45	<0.5	- -	20	7.6	55
MB3-11		CCA	12/10/85	51.0	51.5	0.88	50	45	<0.5	- -	6.6	4.6	25
MB4-01		CCA	12/11/85	1.5	2.0	2.2	37	25	<0.5	- -	230	250	850
MB4-02		CCA	12/11/85	2.5	3.0	7.0	110	17	<0.5	- -	150	290	830
MB4-13		CCA	12/11/85	56.0	56.5	0.62	33	30	<0.5	- -	16	6	27

Table 4-1
Southern Pacific Transportation Company (Bayshore Yard)
Soil Metals Analyses
Report Form #1

Sample Number	QAQC Identification	Lab Code	Date Sampled	Top Depth (ft\msl)	Bottom Depth (ft\msl)	Arsenic mg/kg	Barium mg/kg	Chromium III mg/kg	Chromium VI (Hexavalent) mg/kg	Total Chromium mg/kg	Copper mg/kg	Lead mg/kg	Zinc mg/kg
MB5-01		CCA	12/11/85	1.5	2.0	3.3	65	22	<0.5	- -	530	275	660
MB5-03		CCA	12/11/85	6.0	6.5	1.1	140	30	<0.5	- -	550	5700	2200
MB5-11		CCA	12/11/85	46.0	46.5	0.58	120	35	<0.5	- -	16	7.8	43
MB6-01		CCA	12/13/85	1.0	1.5	1.8	<1	45	<0.5	- -	1000	4100	3400
MB6-02		CCA	12/13/85	3.5	4.0	2.0	20	15	<0.5	- -	500	1300	780
MB6-11		CCA	12/13/85	46.0	46.5	<0.1	100	4.6	<0.5	- -	6.4	2.3	30
MB6-12		CCA	12/13/85	51.0	51.5	1.1	70	50	<0.5	- -	20	7.2	50
MB7-01		CCA	12/13/85	1.5	2.0	0.81	600	28	<0.5	- -	600	16000	2500
MB7-03		CCA	12/13/85	6.0	6.5	1.4	170	7.2	<0.5	- -	550	850	390
MB7-08		CCA	12/13/85	31.0	31.5	0.77	45	40	<0.5	- -	11	9.7	50
MB8-01		CCA	12/13/85	1.5	2.0	0.33	17	8.2	<0.5	- -	12	90	33
MB8-02		CCA	12/13/85	3.5	4.0	0.67	30	6.0	<0.5	- -	20	95	50
MB8-09		CCA	12/13/85	36.0	36.5	2.0	25	20	<0.5	- -	8	3.4	38
MB9-01		CCA	12/17/85	1.5	2.0	<0.1	<1	6.8	<0.5	- -	1.0	<0.10	0.40
MB9-02		CCA	12/17/85	3.5	4.0	<0.1	15.0	21	<0.5	- -	35	25	65
MB9-10		CCA	12/17/85	46.0	46.5	<0.1	19	9.7	<0.5	- -	2.5	1.0	9.0
MW-08A	FDUPE-MK18A-01	CCA	01/15/86	1.5	2.0	<0.1	<1	- -	- -	10	100	17	800
MW-08A	FDUPE-MK18A-02	CCA	01/15/86	3.5	4.0	<0.1	120	- -	- -	1.3	900	1400	290

Table 4-1
Southern Pacific Transportation Company (Bayshore Yard)
Soil Metals Analyses
Report Form #1

Sample Number	QA/QC Identification	Lab Code	Date Sampled	Top Depth (ft\msl)	Bottom Depth (ft\msl)	Arsenic mg/kg	Barium mg/kg	Chromium III mg/kg	Chromium VI (Hexavalent) mg/kg .	Total Chromium mg/kg	Copper mg/kg	Lead mg/kg	Zinc mg/kg
MD-01		CCA	01/23/86	0.0	0.0	8.4	17	14	<0.5	- -	5700	2900	1700
MD-02		CCA	01/23/86	0.0	0.0	23	25	14	<0.5	- -	50	70	75
MD-03		CCA	01/23/86	0.0	0.0	1.7	32	17	<0.5	- -	550	1400	590
MD-04		CCA	01/23/86	0.0	0.0	4.7	19	13	<0.5	- -	120	400	115

Table 4-2
Southern Pacific Transportation Company (Bayshore Yard)
Soils Organics Analyses
Report Form # 1

Sample Number	Test Method	QAQC Identification	Lab Code	Date Sampled	Benzene ug/kg	Bromodichloro-methane ug/kg	Bromoform ug/kg	Bromo-methane ug/kg	Carbontetra-chloride ug/kg	Chloro-benzene ug/kg	Chloro-ethane ug/kg	2-Chloroethyl-vinyl ether ug/kg	Chloroform ug/kg	Chloromethane ug/kg
MK01A-01	601\602		CCA	01/15/86	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0	<10.0	<1.0	<2.0
MK01A-02	601\602		CCA	01/15/86	- -	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0	<10.0	<1.0	<2.0
MK02A-01	601\602		CCA	01/13/86	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0	<10.0	<1.0	<2.0
MK02A-03	601\602		CCA	01/13/86	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0	<10.0	<1.0	<2.0
MK02A-01	601\602	FDUPE-MK3A-01	CCA	01/13/86	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0	<5	<1.0	<2.0
MK03B-01	601\602		CCA	01/20/86	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0	<5	<1.0	<2.0
MK03B-02	601\602		CCA	01/20/86	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0	<5	<1.0	<2.0
MK03B-05	601\602		CCA	01/20/86	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0	<5	<1.0	<2.0
MK04B-01	601\602		CCA	01/22/86	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0	<5	<1.0	<2.0
MK04B-04	601\602		CCA	01/22/86	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0	<5	<1.0	<2.0
MK04B-06	601\602		CCA	01/22/86	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0	<5	<1.0	<2.0
MK04B-07	601\602		CCA	01/22/86	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0	<5	<1.0	<2.0
MK05B-01	601\602		CCA	01/20/86	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0	<5	<1.0	<2.0
MK05B-01	601\602	FDUPE-MK15B-01	CCA	01/20/86	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0	<5	<1.0	<2.0
MK05B-03	601\602		CCA	01/20/86	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0	<5	<1.0	<2.0
MK05B-06	601\602		CCA	01/20/86	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0	<5	<1.0	<2.0
MK06B-01	601\602	FDUPE MK16B-01	CCA	01/21/86	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0	<5	<1.0	<2.0

Table 4-2
Southern Pacific Transportation Company (Bayshore Yard)
Soils Organics Analyses
Report Form # 1

Sample Number	Test Method	QAQC Identification	Lab Code	Date Sampled	Benzene ug/kg	Bromodichloro-methane ug/kg	Bromoform ug/kg	Bromo-methane ug/kg	Carbontetra-chloride ug/kg	Chloro-benzene ug/kg	Chloro-ethane ug/kg	2-Chloroethyl-vinyl ether ug/kg	Chloroform ug/kg	Chloromethane ug/kg
MK06B-01	601\602		CCA	01/21/86	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0	<5	<1.0	<2.0
MK06B-04	601\602		CCA	01/21/86	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0	<5	<1.0	<2.0
MK06B-05	601\602		CCA	01/21/86	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0	<5	<1.0	<2.0
MK06B-09	601\602		CCA	01/21/86	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0	<5	<1.0	<2.0
MK07B-01	601\602		CCA	01/23/86	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0	<5	<1.0	<2.0
MK07B-02	601\602		CCA	01/23/86	1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0	<5	<1.0	<2.0
MK07B-09	601\602		CCA	01/23/86	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0	<5	<1.0	<2.0
MK08A-01	601\602		CCA	01/15/86	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0	<5	<1.0	<2.0
MK08A-02	601\602		CCA	01/15/86	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0	<5	<1.0	<2.0
MK09B-02	8010\8020		CCA	06/12/86	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<1.0	<0.1	<2.0
MK18A-01	601\602	FDUPE MK8A-01	CCA	01/15/86	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0	<5	<1.0	<2.0
MK18A-02	601\602	FDUPE MK8A-02	CCA	01/15/86	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0	<5	<1.0	<2.0
MK1A-01	601\602	FDUPE-MK19A-01	CCA	01/15/86	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0	<5	<1.0	<2.0
MK1A-02	601\602	FDUPE-MK19A-02	CCA	01/15/86	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0	<5	<1.0	<2.0
MB2-04			CCA	12/09/85	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
MB2-06			CCA	12/09/85	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
MB3-01			CCA	12/10/85	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
MB8-02			CCA	12/13/85	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -

Table 4-2
Southern Pacific Transportation Company (Bayshore Yard)
Soils Organics Analyses
Report Form # 1

Sample Number	Test Method	QAQC Identification	Lab Code	Date Sampled	Benzene ug/kg	Bromodichloro-methane ug/kg	Bromoform ug/kg	Bromo-methane ug/kg	Carbontetra-chloride ug/kg	Chloro-benzene ug/kg	Chloro-ethane ug/kg	2-Chloroethyl-vinyl ether ug/kg	Chloroform ug/kg	Chloromethane ug/kg
MB9-03			CCA	12/17/85	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -

Table 4-2 (cont)
Southern Pacific Transportation Company (Bayshore Yard)
Soils Organics Analyses
Report Form # 2

Sample Number	Test Method	QAQC Identification	Date Sampled	Dibromochloro-methane ug/kg	1,2-Dichloro-benzene ug/kg	1,3-Dichloro-benzene ug/kg	1,4-Dichloro-benzene ug/kg	1,1-Dichloro-ethane ug/kg	1,2-Dichloro-ethene ug/kg	1,1-Dichloro-ethene ug/kg	trans-1,2-Di-chloroethene ug/kg	1,2-Dichloro-propane ug/kg
MK01A-01	601\602		01/15/86	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MK01A-02	601\602		01/15/86	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MK02A-01	601\602		01/13/86	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MK02A-03	601\602		01/13/86	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MK02A-01	601\602	FDUPE-MK3A-01	01/13/86	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MK03B-01	601\602		01/20/86	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MK03B-02	601\602		01/20/86	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MK03B-05	601\602		01/20/86	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MK04B-01	601\602		01/22/86	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MK04B-04	601\602		01/22/86	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MK04B-06	601\602		01/22/86	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MK04B-07	601\602		01/22/86	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MK05B-01	601\602		01/20/86	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MK05B-01	601\602	FDUPE-MK15B-01	01/20/86	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MK05B-03	601\602		01/20/86	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MK05B-06	601\602		01/20/86	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MK06B-01	601\602	FDUPE MK16B-01	01/21/86	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0

Table 4-2 (cont)
Southern Pacific Transportation Company (Bayshore Yard)
Soils Organics Analyses
Report Form # 2

Sample Number	Test Method	QAQC Identification	Date Sampled	Dibromochloro-methane ug/kg	1,2-Dichloro-benzene ug/kg	1,3-Dichloro-benzene ug/kg	1,4-Dichloro-benzene ug/kg	1,1-Dichloro-ethane ug/kg	1,2-Dichloro-ethane ug/kg	1,1-Dichloro-ethene ug/kg	trans-1,2-Di-chloroethene ug/kg	1,2-Dichloro-propane ug/kg
MK06B-01	601\602		01/21/86	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MK06B-04	601\602		01/21/86	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MK06B-05	601\602		01/21/86	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MK06B-09	601\602		01/21/86	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MK07B-01	601\602		01/23/86	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MK07B-02	601\602		01/23/86	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MK07B-09	601\602		01/23/86	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MK08A-01	601\602		01/15/86	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MK08A-02	601\602		01/15/86	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MK09B-02	8010\8020		06/12/86	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
MK18A-01	601\602	FDUPE MK8A-01	01/15/86	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MK18A-02	601\602	FDUPE MK8A-02	01/15/86	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MK1A-01	601\602	FDUPE-MK19A-01	01/15/86	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MK1A-02	601\602	FDUPE-MK19A-02	01/15/86	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MB2-04			12/09/85	--	--	--	--	--	--	--	--	--
MB2-06			12/09/85	--	--	--	--	--	--	--	--	--
MB3-01			12/10/85	--	--	--	--	--	--	--	--	--
MB8-02			12/13/85	--	--	--	--	--	--	--	--	--

Table 4-2 (cont)
Southern Pacific Transportation Company (Bayshore Yard)
Soils Organics Analyses
Report Form # 2

Sample Number	Test Method	QAQC Identification	Date Sampled	Dibromochloro-methane ug/kg	1,2-Dichloro-benzene ug/kg	1,3-Dichloro-benzene ug/kg	1,4-Dichloro-benzene ug/kg	1,1-Dichloro-ethane ug/kg	1,2-Dichloro-ethane ug/kg	1,1-Dichloro-ethene ug/kg	trans-1,2-Di-chloroethene ug/kg	1,2-Dichloro-propane ug/kg
MB9-03			12/17/85	- -	- -	- -	- -	- -	- -	- -	- -	- -

Table 4-2 (cont)
Southern Pacific Transportation Company (Bayshore Yard)
Soils Organics Analyses
Report Form # 3

Sample Number	Test Method	QAQC Identification	Date Sampled	cis-1,3 Dichloro-propylene ug/kg	trans-1,3-Dichloro-propylene ug/kg	Ethyl Benzene ug/kg	Methylene-chloride ug/kg	1,1,2,2-Tetra-chloroethane ug/kg	Tetrachloro-ethylene ug/kg	Toluene ug/kg	1,1,1-Tri-chloroethane ug/kg	1,1,2-Tri-chloroethane ug/kg
MK01A-01	601\602		01/15/86	<1.0	<1.0	<1.0	<10	<5.0	<1.0	94	<1.0	<1.0
MK01A-02	601\602		01/15/86	<1.0	<1.0	<1.0	<10	<5.0	<1.0	13	<1.0	<1.0
MK02A-01	601\602		01/13/86	<1.0	<1.0	<1.0	<10	<5.0	<1.0	79	<1.0	<1.0
MK02A-03	601\602		01/13/86	<1.0	<1.0	<1.0	<10	<5.0	<1.0	65	- -	<1.0
MK02A-01	601\602	FDUPE-MK3A-01	01/13/86	<1.0	<1.0	<1.0	<5.0	<5.0	<1.0	170	<1.0	<1.0
MK03B-01	601\602		01/20/86	<1.0	<1.0	<1.0	<5.0	<5.0	<1.0	140	<1.0	<1.0
MK03B-02	601\602		01/20/86	<1.0	<1.0	<1.0	<5.0	<5.0	<1.0	2.0	<1.0	<1.0
MK03B-05	601\602		01/20/86	<1.0	<1.0	<1.0	<5.0	<5.0	<1.0	45	<1.0	<1.0
MK04B-01	601\602		01/22/86	<1.0	<1.0	<1.0	<5.0	<5.0	<1.0	<2.0	<1.0	<1.0
MK04B-04	601\602		01/22/86	<1.0	<1.0	<1.0	<5.0	<5.0	<1.0	<2.0	<1.0	<1.0
MK04B-06	601\602		01/22/86	<1.0	<1.0	<1.0	<5.0	<5.0	<1.0	3.9	<1.0	<1.0
MK04B-07	601\602		01/22/86	<1.0	<1.0	<1.0	<5.0	<5.0	<1.0	<2.0	<1.0	<1.0
MK05B-01	601\602		01/20/86	<1.0	<1.0	<1.0	<5.0	<5.0	<1.0	<2.0	<1.0	<1.0
MK05B-01	601\602	FDUPE-MK15B-01	01/20/86	<1.0	<1.0	<1.0	<5.0	<5.0	<1.0	22	<1.0	<1.0
MK05B-03	601\602		01/20/86	<1.0	<1.0	<1.0	<5.0	<5.0	<1.0	2.4	<1.0	<1.0
MK05B-06	601\602		01/20/86	<1.0	<1.0	<1.0	<5.0	<5.0	<1.0	2.1	<1.0	<1.0
MK06B-01	601\602	FDUPE MK16B-01	01/21/86	<1.0	<1.0	2.0	<5.0	<5.0	<1.0	100	<1.0	<1.0

Table 4-2 (cont)
Southern Pacific Transportation Company (Bayshore Yard)
Soils Organics Analyses
Report Form # 3

Sample Number	Test Method	QAQC Identification	Date Sampled	cis-1,3 Dichloro-propylene ug/kg	trans-1,3-Dichloro-propylene ug/kg	Ethyl Benzene ug/kg	Methylene-chloride ug/kg	1,1,2,2-Tetra-chloroethane ug/kg	Tetrachloro-ethylene ug/kg	Toluene ug/kg	1,1,1-Tri-chloroethane ug/kg	1,1,2-Tri-chloroethane ug/kg
MK06B-01	601\602		01/21/86	<1.0	<1.0	<1.0	<5.0	<2.0	<1.0	65	1.3	<1.0
MK06B-04	601\602		01/21/86	<1.0	<1.0	<1.0	<5.0	<5.0	<1.0	<2.0	<1.0	<1.0
MK06B-05	601\602		01/21/86	<1.0	<1.0	<1.0	<5.0	<5.0	<1.0	37	<1.0	<1.0
MK06B-09	601\602		01/21/86	<1.0	<1.0	<1.0	<5.0	<5.0	<1.0	57	<1.0	<1.0
MK07B-01	601\602		01/23/86	<1.0	<1.0	<1.0	<5.0	<5.0	<1.0	<2.0	<1.0	<1.0
MK07B-02	601\602		01/23/86	<1.0	<1.0	<1.0	<5.0	<5.0	<1.0	18	<1.0	<1.0
MK07B-09	601\602		01/23/86	<1.0	<1.0	<1.0	<5.0	<5.0	<1.0	<2.0	<1.0	<1.0
MK08A-01	601\602		01/15/86	<1.0	<1.0	<1.0	<5.0	<5.0	4.0	150	<1.0	<1.0
MK08A-02	601\602		01/15/86	<1.0	<1.0	<1.0	<5.0	<5.0	18.0	82	<1.0	<1.0
MK09B-02	8010\8020		06/12/86	<0.1	<0.1	<0.1	<10	<0.5	<0.5	3.5	<0.1	<0.1
MK18A-01	601\602	FDUPE MK8A-01	01/15/86	<1.0	<1.0	<1.0	<5.0	<5.0	8.7	64	<1.0	<1.0
MK18A-02	601\602	FDUPE MK8A-02	01/15/86	<1.0	<1.0	<1.0	<5.0	<5.0	6.4	150	<1.0	<1.0
MK1A-01	601\602	FDUPE-MK19A-01	01/15/86	<1.0	<1.0	<1.0	<5.0	<5.0	<1.0	44	<1.0	<1.0
MK1A-02	601\602	FDUPE-MK19A-02	01/15/86	<1.0	<1.0	<1.0	<5.0	<5.0	<1.0	230	<1.0	<1.0
MB2-04			12/09/85	- -	- -	- -	- -	- -	- -	- -	- -	- -
MB2-06			12/09/85	- -	- -	- -	- -	- -	- -	- -	- -	- -
MB3-01			12/10/85	- -	- -	- -	- -	- -	- -	- -	- -	- -
MB8-02			12/13/85	- -	- -	- -	- -	- -	- -	- -	- -	- -

Table 4-2 (cont)
Southern Pacific Transportation Company (Bayshore Yard)
Soils Organics Analyses
Report Form # 3

Sample Number	Test Method	QAQC Identification	Date Sampled	cis-1,3 Dichloro-propylene ug/kg	trans-1,3-Dichloro-propylene ug/kg	Ethyl Benzene ug/kg	Methylene-chloride ug/kg	1,1,2,2-Tetra-chloroethane ug/kg	Tetrachloro-ethylene ug/kg	Toluene ug/kg	1,1,1-Tri-chloroethane ug/kg	1,1,2-Tri-chloroethane ug/kg
MB9-03			12/17/85	- -	- -	- -	- -	- -	- -	- -	- -	- -

Table 4-2 (cont)
Southern Pacific Transportation Company (Bayshore Yard)
Soils Organics Analyses
Report Form # 4

Sample Number	Test Method	QAQC Identification	Date Sampled	Trichloro-ethylene ug/kg	Trichloro-fluormethane ug/kg	Vinyl Chloride ug/kg	Total Xylene ug/kg	Total Petroleum Hydrocarbons mg/kg
MK01A-01	601\602		01/15/86	<1.0	<1.0	<1.0	<1.0	- -
MK01A-02	601\602		01/15/86	<1.0	<1.0	<1.0	<1.0	- -
MK02A-01	601\602		01/13/86	<1.0	<1.0	<1.0	<1.0	- -
MK02A-03	601\602		01/13/86	<1.0	<1.0	<1.0	<1.0	- -
MK02A-01	601\602	FDUPE-MK3A-01	01/13/86	<10.0	<1.0	<1.0	<1.0	- -
MK03B-01	601\602		01/20/86	<1.0	<1.0	<1.0	1.2	- -
MK03B-02	601\602		01/20/86	<1.0	<1.0	<1.0	<1.0	- -
MK03B-05	601\602		01/20/86	<1.0	<1.0	<1.0	9.2	- -
MK04B-01	601\602		01/22/86	<1.0	<1.0	<1.0	<1.0	- -
MK04B-04	601\602		01/22/86	<1.0	<1.0	<1.0	<1.0	- -
MK04B-06	601\602		01/22/86	<1.0	<1.0	<1.0	6.8	- -
MK04B-07	601\602		01/22/86	<1.0	<1.0	<1.0	<1.0	- -
MK05B-01	601\602		01/20/86	<1.0	<1.0	<1.0	1.8	- -
MK05B-01	601\602	FDUPE-MK15B-01	01/20/86	<1.0	<1.0	<1.0	14	- -
MK05B-03	601\602		01/20/86	<1.0	<1.0	<1.0	4.6	- -
MK05B-06	601\602		01/20/86	<1.0	<1.0	<1.0	1.2	- -
MK06B-01	601\602	FDUPE MK16B-01	01/21/86	<1.0	<1.0	<1.0	28	- -

Table 4-2 (cont)
Southern Pacific Transportation Company (Bayshore Yard)
Soils Organics Analyses
Report Form # 4

Sample Number	Test Method	QA/QC Identification	Date Sampled	Trichloro-ethylene ug/kg	Trichloro-fluoromethane ug/kg	Vinyl Chloride ug/kg	Total Xylene ug/kg	Total Petroleum Hydrocarbons mg/kg
MK06B-01	601\602		01/21/86	<1.0	<1.0	<1.0	1.0	- -
MK06B-04	601\602		01/21/86	<1.0	<1.0	<1.0	<1.0	- -
MK06B-05	601\602		01/21/86	<1.0	<1.0	<1.0	8.0	- -
MK06B-09	601\602		01/21/86	<1.0	<1.0	<1.0	1.0	- -
MK07B-01	601\602		01/23/86	<1.0	<1.0	<1.0	<1.0	- -
MK07B-02	601\602		01/23/86	<1.0	<1.0	<1.0	5.0	- -
MK07B-09	601\602		01/23/86	<1.0	<1.0	<1.0	<1.0	- -
MK08A-01	601\602		01/15/86	<1.0	<1.0	<1.0	<1.0	- -
MK08A-02	601\602		01/15/86	<1.0	<1.0	<1.0	<1.0	- -
MK09B-02	8010\8020		06/12/86	<0.5	<0.1	<0.1	1.5	- -
MK18A-01	601\602	FDUPE MK8A-01	01/15/86	<1.0	<1.0	<1.0	<1.0	- -
MK18A-02	601\602	FDUPE MK8A-02	01/15/86	<1.0	<1.0	<1.0	<1.0	- -
MK1A-01	601\602	FDUPE-MK19A-01	01/15/86	<1.0	<1.0	<1.0	1.6	- -
MK1A-02	601\602	FDUPE-MK19A-02	01/15/86	<1.0	<1.0	<1.0	<1.0	- -
MB2-04			12/09/85	- -	- -	- -	- -	1
MB2-06			12/09/85	- -	- -	- -	- -	1.2
MB3-01			12/10/85	- -	- -	- -	- -	11000
MB8-02			12/13/85	- -	- -	- -	- -	9

Table 4-2 (cont)
Southern Pacific Transportation Company (Bayshore Yard)
Soils Organics Analyses
Report Form # 4

Sample Number	Test Method	QAQC Identification	Date Sampled	Trichloro-ethylene ug/kg	Trichloro-fluoromethane ug/kg	Vinyl Chloride ug/kg	Total Xylene ug/kg	Total Petroleum Hydrocarbons mg/kg
M89-03			12/17/85	- -	- -	- -	- -	4

Table 4-3
Southern Pacific Transportation Company (Bayshore Yard)
Ground Water Metals Analyses
Report Form #1

Sample Number	QAQC Identification	Lab Code	Date Sampled	Arsenic mg/l	Barium mg/l	Total Chromium mg/l	Copper mg/l	Lead mg/l	Zinc mg/l
MK-01A		CCA	04/24/86	0.01	<0.1	<0.005	0.01	<0.005	0.06
MK-01A		SEQ	02/24/89	<0.01	0.27	<0.005	<0.01	<0.005	0.054
MK-02A		CCA	04/22/86	0.07	<0.1	<0.005	<0.040	<0.005	<0.040
MK-02A	FDUPE-MK22-A	CCA	04/22/86	0.11	<0.1	<0.005	<0.040	<0.005	<0.040
MK-02A		SEQ	03/01/89	<0.01	0.13	<0.005	<0.01	<0.005	0.06
MK-03B		CCA	04/22/86	<0.005	0.2	<0.005	<0.040	<0.005	<0.040
MK-04A		CCA	04/22/86	<0.005	<0.1	<0.005	<0.040	<0.005	<0.040
MK-04B		CCA	04/22/86	<0.005	<0.1	<0.005	<0.040	<0.005	<0.040
MK-05A		CCA	04/22/86	0.020	<0.1	<0.005	<0.040	<0.005	<0.040
MK-05B		CCA	04/22/86	<0.005	<0.1	<0.005	<0.040	<0.005	<0.040
MK-06A		CCA	04/23/86	0.028	0.1	0.010	<0.040	<0.005	<0.040
MK-06A		SEQ	03/01/89	0.023	0.16	<0.005	<0.01	0.013	0.042
MK-06B		CCA	04/21/86	<0.005	0.2	0.01	<0.040	<0.005	<0.040
MK-06B	FDUPE MK-16B	CCA	04/21/86	<0.005	<0.1	<0.01	<0.040	<0.005	0.06
MK-06B		SEQ	03/01/89	<0.01	0.18	0.012	<0.01	<0.005	0.086
MK-07A		CCA	04/28/86	<0.005	<0.1	<0.005	<0.040	0.04	0.05
MK-07A		SEQ	02/15/89	<0.01	0.13	<0.005	<0.01	<0.005	0.08

Table 4-3
Southern Pacific Transportation Company (Bayshore Yard)
Ground Water Metals Analyses
Report Form #1

Sample Number	QAQC Identification	Lab Code	Date Sampled	Arsenic mg/l	Barium mg/l	Total Chromium mg/l	Copper mg/l	Lead mg/l	Zinc mg/l
MK-07B		CCA	04/28/86	<0.005	<0.1	<0.005	<0.040	0.055	0.05
MK-07B		SEQ	02/15/89	<0.01	0.36	<0.005	<0.01	<0.005	0.026
MK-08A		CCA	04/24/86	<0.005	<0.1	0.009	0.07	<0.005	1.8
MK-08A		SEQ	02/21/89	<0.01	0.042	<0.005	0.024	<0.005	0.7
MK-09A		CCA	06/19/86	<0.005	<0.1	<0.005	<0.040	<0.005	0.06
MK-09A		SEQ	03/05/89	<0.01	0.11	<0.005	<0.01	<0.005	0.044
MK-09B		CCA	06/19/86	<0.005	<0.1	<0.005	<0.040	<0.005	0.09
MK-09B		SEQ	03/05/89	<0.01	0.13	<0.005	<0.01	<0.005	0.038
MK-09B	FDUPE MK-19B	SEQ	03/05/89	<0.01	0.14	0.11	<0.01	<0.005	0.046
MW-01B		CCA	04/24/86	<0.005	0.1	0.008	0.02	<0.005	0.06
MW-01B		SEQ	02/24/89	<0.01	0.58	<0.005	<0.01	0.11	0.039
MW-02B		CCA	04/22/86	<0.005	0.1	<0.005	<0.040	<0.005	<0.040
MW-02B		SEQ	03/01/89	<0.01	0.13	0.026	0.019	<0.005	0.041
MW-03A		CCA	04/22/86	<0.005	<0.1	<0.005	<0.040	<0.005	<0.040
MW-04A		CCA	04/22/86	0.021	<0.1	<0.005	<0.040	<0.005	<0.040
MW-05A		CCA	04/17/86	<0.005	0.2	0.036	<0.040	0.011	<0.040
MW-05B		CCA	04/17/86	<0.005	0.2	0.032	<0.040	0.030	<0.040
MW-06A		CCA	04/17/86	<0.005	<0.1	<0.005	<0.040	<0.005	<0.040

Table 4-3
Southern Pacific Transportation Company (Bayshore Yard)
Ground Water Metals Analyses
Report Form #1

Sample Number	QAQC Identification	Lab Code	Date Sampled	Arsenic mg/l	Barium mg/l	Total Chromium mg/l	Copper mg/l	Lead mg/l	Zinc mg/l
MW-06B		CCA	04/17/86	<0.005	<0.1	0.009	<0.040	<0.005	<0.040
MW-07A		CCA	04/17/86	<0.005	0.3	<0.005	0.09	0.46	0.12
MW-08A		CCA	04/17/86	<0.005	<0.1	<0.005	<0.040	<0.005	<0.040
MW-08A	UNFIL\PRESERVED	CCA	08/12/86	0.021	0.17	0.23	4.8	12	24
MW-08A	FILT\PRESERVED	CCA	08/12/86	- -	0.049	0.092	- -	- -	1.2
MW-08B		CCA	04/17/86	<0.005	<0.1	<0.005	<0.040	<0.005	<0.040
MW-09A		CCA	04/23/86	<0.005	0.2	<0.005	<0.040	<0.005	<0.040
MW-09B		CCA	04/23/86	<0.005	0.2	<0.005	<0.040	<0.005	<0.040
MW-10A		CCA	04/28/86	0.04	<0.1	<0.005	0.05	0.016	0.05
MW-10A		SEQ	02/17/89	0.047	0.11	<0.005	<0.01	<0.005	0.048
MW-10B		CCA	04/28/86	<0.005	<0.1	<0.005	<0.040	<0.005	0.06
MW-10B		SEQ	03/01/89	<0.01	0.12	<0.005	<0.01	<0.005	0.038
MW-11A		CCA	04/23/86	0.061	0.2	0.01	<0.040	<0.005	<0.040
MW-11A	FDUPE- MW-111A	CCA	04/21/86	0.069	- -	<0.005	<0.4	<0.005	<0.040
MW-11B		CCA	04/23/86	<0.005	<0.1	0.01	<0.040	<0.005	<0.040
MW-11B		SEQ	03/03/89	<0.01	0.63	<0.005	<0.01	0.081	0.045
MW-12B		CCA	04/24/86	<0.005	<0.1	<0.005	0.01	<0.005	0.07
MW-12B		SEQ	02/21/89	<0.01	0.27	0.009	<0.01	<0.005	0.066

Table 4-3
Southern Pacific Transportation Company (Bayshore Yard)
Ground Water Metals Analyses
Report Form #1

Sample Number	QAQC Identification	Lab Code	Date Sampled	Arsenic mg/l	Barium mg/l	Total Chromium mg/l	Copper mg/l	Lead mg/l	Zinc mg/l
MW-13A		CCA	04/21/86	<0.005	<0.010	0.03	<0.040	<0.005	0.08
MW-13A		SEQ	02/16/89	0.012	0.11	<0.005	<0.01	0.11	0.035
MW-13B		CCA	04/23/86	<0.005	<0.1	<0.01	<0.040	<0.005	0.12
MW-13B		SEQ	02/16/89	<0.01	0.77	0.021	<0.01	0.054	0.041
MW-14A		CCA	04/23/86	<0.005	1.5	<0.01	<0.040	0.025	0.06
MW-14A	UNFIL\PRESERVED	CCA	08/12/86	0.1	3.2	0.11	- -	12	1.7
MW-14A	FILT\PRESERVED	CCA	08/12/86	0.032	1.3	0.069	- -	- -	- -
MW-14B		CCA	04/23/86	<0.005	0.2	<0.01	<0.040	<0.005	0.07
MW-15A		CCA	04/23/86	<0.005	1.0	0.02	<0.040	0.010	0.45
MW-15A		SEQ	02/23/89	<0.01	0.61	<0.005	<0.01	<0.005	0.069
MW-16A		CCA	04/23/86	<0.005	<0.1	<0.005	<0.040	<0.005	0.06
MW-16A		SEQ	02/23/89	<0.01	0.18	<0.005	0.01	<0.005	0.051
MW-16B		CCA	04/23/86	<0.005	<0.1	0.02	<0.040	<0.005	0.17
MW-16B		SEQ	02/23/89	<0.01	0.81	0.05	<0.01	0.051	1.7
MW-17A		CCA	04/28/86	<0.005	0.2	<0.01	<0.040	<0.005	0.12
MW-17A		SEQ	02/23/89	<0.01	0.2	0.008	<0.01	<0.005	0.051
MW-17A		SEQ	02/22/89	<0.01	0.25	<0.005	<0.01	<0.005	0.046
MW-17B		CCA	04/28/86	<0.005	0.7	<0.01	<0.040	<0.005	0.06

Table 4-3
Southern Pacific Transportation Company (Bayshore Yard)
Ground Water Metals Analyses
Report Form #1

Sample Number	QAQC Identification	Lab Code	Date Sampled	Arsenic mg/l	Barium mg/l	Total Chromium mg/l	Copper mg/l	Lead mg/l	Zinc mg/l
KMW-06B		SEQ	03/07/89	<0.01	6.4	0.02	<0.01	0.015	0.032
KMW-07A		SEQ	03/01/89	<0.01	0.21	<0.005	0.012	<0.005	0.067
BR-305	BRNSE-3/5-1119	SEQ	03/05/89	<0.01	0.095	<0.05	<0.01	<0.005	<0.01
DW-303	DITCH N20-0679	SEQ	03/01/89	<0.01	0.17	<0.005	0.017	0.014	0.038
DW-SS-1AF	DW-FIL IN FIELD	CCA	11/13/86	<0.005	0.35	0.010	<0.04	<0.005	0.24
DW-SS-2AF	DW-FIL IN FIELD	CCA	11/13/86	<0.005	0.16	0.015	<0.04	0.005	0.20
MB02(2-1	FIL\GW\MW14A	CCA	08/12/86	0.11	1.3	- -	0.07	0.57	0.96
MB05(2)	FIL\GW\MW14A	CCA	08/12/86	- -	6.3	- -	0.6	34	9.6
MB08A(2)	CITRATE DI BUFF	CCA	08/12/86	- -	2.4	- -	9.1	71	36
DCNWT	DECON WATER2-16	SEQ	02/16/89	<0.01	<0.02	<0.005	<0.01	<0.005	0.013

Table 4-4
Southern Pacific Transportation Company (Bayshore Yard)
Ground Water Organics Analyses
Report Form # 1

Sample Number	Test Method	QA/QC Identification	Lab Code	Date Sampled	Benzene ug/l	Bromodichloro-methane ug/l	Bromoform ug/l	Bromo-methane ug/l	Carbontetra-chloride ug/l	Chloro-benzene ug/l	Chloro-ethane ug/l	2-Chloroethyl-vinyl ether ug/l	Chloroform ug/l	Chloromethane ug/l
MK-01A	601\602		CCA	04/24/86	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	6.2	<1.0	<0.1	<0.2
MK-01A	8010/8020		SEQ	02/26/89	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	<0.5	<0.5
MK-02A	601\602		CCA	04/22/86	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<1.0	<0.1	<0.2
MK-02A	8010/8020		SEQ	03/02/89	0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	<0.5	<0.5
MK-03B	601\602		CCA	04/22/86	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<1.0	<0.1	<0.2
MK-03B	8010/8020		SEQ	03/07/89	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	<0.5	<0.5
MK-04A	601\602		CCA	04/22/86	0.3	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<1.0	<0.1	<0.2
MK-04A	8010/8020		SEQ	03/03/89	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	<0.5	<0.5
MK-04B	601\602		CCA	04/22/86	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<1.0	<0.1	<0.2
MK-04B	8010/8020		SEQ	03/03/89	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	<0.5	<0.5
MK-05A	601\602		CCA	04/22/86	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<1.0	<0.1	<0.2
MK-05A	8010/8020		SEQ	03/05/89	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	<0.5	<0.5
MK-05B	601\602		CCA	04/22/86	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<1.0	<0.1	<0.2
MK-06A	601\602		CCA	04/23/86	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<1.0	<0.1	<0.2
MK-06A	8010/8020		SEQ	03/03/89	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	<0.5	<0.5
MK-06B	601\602		CCA	04/21/86	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<1.0	<0.1	<0.2
MK-06B	601\602	FDUPE MK-16B	CCA	04/29/86	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<1.0	<0.1	<0.2

Table 4-4
Southern Pacific Transportation Company (Bayshore Yard)
Ground Water Organics Analyses
Report Form # 1

Sample Number	Test Method	QAQC Identification	Lab Code	Date Sampled	Benzene ug/l	Bromodichloro-methane ug/l	Bromoform ug/l	Bromo-methane ug/l	Carbontetra-chloride ug/l	Chloro-benzene ug/l	Chloro-ethane ug/l	2-Chloroethyl-vinyl ether ug/l	Chloroform ug/l	Chloromethane ug/l
MK-06B	8010/8020		SEQ	03/03/89	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	<0.5	<0.5
MK-07A	601\602		CCA	04/28/86	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<1.0	<0.1	<0.2
MK-07A	8010/8020		SEQ	02/17/89	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	<0.5	<0.5
MK-07B	601\602		CCA	04/28/86	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<1.0	<0.1	<0.2
MK-07B	8010/8020		SEQ	02/17/89	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	<0.5	<0.5
MK-08A	601\602		CCA	04/24/86	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<1.0	<0.1	<0.2
MK-08A	8010/8020		SEQ	02/23/89	<1.0	<2.0	<2.0	<2.0	<2.0	<2.0	<10.0	<2.0	<1.0	<1.0
MK-09A	601\602		CCA	06/19/86	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<1.0	<0.1	<0.2
MK-09A	8010/8020		SEQ	03/07/89	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	<0.5	<0.5
MK-09B	601\602		CCA	06/19/86	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<1.0	<0.1	<0.2
MK-09B	8010/8020		SEQ	03/07/89	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	<0.5	<0.5
MK-09B	8010/8020	FDUPE MK-09B	SEQ	03/07/89	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	<0.5	<0.5
MK-22A	601\602	FDUPE-MK02-A	CCA	04/22/86	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<1.0	<0.1	<0.2
MW-10B	8010/8020		SEQ	03/03/89	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	<0.5	<0.5
MW-01B	601\602		CCA	04/24/86	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<1.0	<0.1	<0.2
MW-01B	8010/8020		SEQ	02/26/89	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	<0.5	<0.5
MW-02B	601\602		CCA	04/22/86	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<1.0	<0.1	<0.2
MW-02B	8010/8020		SEQ	03/02/89	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	<0.5	<0.5

Table 4-4
Southern Pacific Transportation Company (Bayshore Yard)
Ground Water Organics Analyses
Report Form # 1

Sample Number	Test Method	QAQC Identification	Lab Code	Date Sampled	Benzene ug/l	Bromodichloro-methane ug/l	Bromoform ug/l	Bromo-methane ug/l	Carbontetra-chloride ug/l	Chloro-benzene ug/l	Chloro-ethane ug/l	2-Chloroethyl-vinyl ether ug/l	Chloroform ug/l	Chloromethane ug/l
MW-03A	601\602		CCA	04/22/86	0.6	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<1.0	<0.1	<0.2
MW-03A	8010/8020		SEQ	03/07/89	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	<0.5	<0.5
MW-04A	601\602		CCA	04/22/86	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<1.0	<0.1	<0.2
MW-04A	8010/8020		SEQ	03/05/89	<25	<50	<50	<50	<50	<50	<250	<50	<25	<25
MW-05A	601\602		CCA	04/17/86	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<1.0	<0.1	<0.2
MW-05A	601\602		CCA	06/30/86	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<1.0	<0.1	<0.2
MW-05A	5030/8020		SEQ	03/09/89	<0.5	- -	- -	- -	- -	- -	- -	- -	- -	- -
MW-05B	601\602		CCA	04/17/86	0.5	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<1.0	0.21	<0.2
MW-05B	601\602		CCA	06/30/86	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<1.0	<0.1	<0.2
MW-05B	5030/8010		SEQ	03/09/89	- -	<10	<10	<10	<10	<10	<50	<10	<5.0	<5.0
MW-05B	5030/8020		SEQ	03/09/89	<0.5	- -	- -	- -	- -	- -	- -	- -	- -	- -
MW-06A	601\602		CCA	04/17/86	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<1.0	<0.1	<0.2
MW-06A	8010/8020		SEQ	03/05/89	<25	<50	<50	<50	<50	<50	<250	<50	<25	<25
MW-06B	601\602		CCA	04/17/86	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<1.0	<0.1	<0.2
MW-06B	8010/8020		SEQ	03/05/89	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	<0.5	<0.5
MW-07A	601\602		CCA	04/17/86	0.8	<0.1	<0.2	<0.1	<0.1	0.5	<0.1	<1.0	<0.1	<0.2
MW-08A	601\602		CCA	04/17/86	0.2	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<1.0	<0.1	<0.2
MW-08A	8010/8020		SEQ	03/05/89	<25	<50	<50	<50	<50	<50	<250	<50	<25	<25

Table 4-4
Southern Pacific Transportation Company (Bayshore Yard)
Ground Water Organics Analyses
Report Form # 1

Sample Number	Test Method	QAQC Identification	Lab Code	Date Sampled	Benzene ug/l	Bromodichloro-methane ug/l	Bromoform ug/l	Bromo-methane ug/l	Carbontetra-chloride ug/l	Chloro-benzene ug/l	Chloro-ethane ug/l	2-Chloroethyl-vinyl ether ug/l	Chloroform ug/l	Chloromethane ug/l
MW-08B	8010/8020		SEQ	03/05/89	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	<0.5	<0.5
MW-09A	601\602		CCA	04/23/86	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<1.0	<0.1	<0.2
MW-09A	8010/8020		SEQ	03/03/89	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	<0.5	<0.5
MW-09B	601\602		CCA	04/17/86	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<1.0	<0.1	<0.2
MW-09B	601\602		CCA	04/22/86	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<1.0	<0.1	<0.2
MW-09B	8010/8020		SEQ	03/03/89	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	<0.5	<0.5
MW-10A	601\602		CCA	04/28/86	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<1.0	<0.1	<0.2
MW-10A	8010/8020		SEQ	02/17/89	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	<0.5	<0.5
MW-10B	601\602		CCA	04/28/86	0.2	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<1.0	0.3	<0.2
MW-11A	601\602		CCA	04/23/86	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<1.0	<0.1	<0.2
MW-11A	601\602	FDUPE-MW-111A	CCA	04/21/86	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<1.0	<0.1	<0.2
MW-11B	601\602		CCA	04/23/86	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<1.0	<0.1	<0.2
MW-11B	8010/8020		SEQ	03/05/89	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	<0.5	<0.5
MW-12B	601\602		CCA	04/24/86	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<1.0	<0.1	<0.2
MW-13A	601\602		CCA	04/29/86	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<1.0	<0.1	<0.2
MW-13A	8010/8020		SEQ	02/18/89	<1.0	<2.0	<2.0	<2.0	<2.0	<2.0	<10	<2.0	<1.0	<1.0
MW-13B	601\602		CCA	04/29/86	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<1.0	<0.1	<0.2
MW-13B	8010/8020		SEQ	02/18/89	<1.0	<2.0	<2.0	<2.0	<2.0	<2.0	<10.0	<2.0	<1.0	<1.0

Table 4-4
Southern Pacific Transportation Company (Bayshore Yard)
Ground Water Organics Analyses
Report Form # 1

Sample Number	Test Method	QAQC Identification	Lab Code	Date Sampled	Benzene ug/l	Bromodichloro-methane ug/l	Bromoform ug/l	Bromo-methane ug/l	Carbontetra-chloride ug/l	Chloro-benzene ug/l	Chloro-ethane ug/l	2-Chloroethyl-vinyl ether ug/l	Chloroform ug/l	Chloromethane ug/l
MW-14A	601\602		CCA	04/29/86	0.7	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<1.0	<0.1	<0.2
MW-14B	601\602		CCA	04/29/86	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<1.0	<0.1	<0.2
MW-15A	601\602		CCA	04/29/86	6.6	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<1.0	<0.1	<0.2
MW-15A	8010/8020		SEQ	02/25/89	1.5	<1.0	<1.0	<1.0	<1.0	<1.0	5.4	<1.0	<0.5	<0.5
MW-15A	5030/8010		SEQ	03/09/89	- -	<5000	<5000	<5000	<5000	<5000	<25000	<5000	<2500	<2500
MW-15A	5030/8020		SEQ	03/09/89	<0.5	- -	- -	- -	- -	- -	- -	- -	- -	- -
MW-16A	601\602		CCA	04/29/86	0.9	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<1.0	<0.1	<0.2
MW-16A	8010/8020		SEQ	02/25/89	0.84	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	<0.5	<0.5
MW-16B	601\602		CCA	04/29/86	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<1.0	<0.1	<0.2
MW-16B	8010/8020		SEQ	02/25/89	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	<0.5	<0.5
MW-17A	601\602		CCA	04/28/86	0.3	0.6	<0.2	<0.1	<0.1	<0.1	60	<1.0	<0.1	<0.2
MW-17A	8010/8020		SEQ	02/25/89	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	6	<1.0	<0.5	<0.5
MW-17A	8010/8020		SEQ	02/24/89	<1.0	<2.0	<2.0	<2.0	<2.0	<2.0	<10.0	<2.0	<1.0	<1.0
MW-17B	601\602		CCA	04/28/86	0.1	<0.1	<0.2	<0.1	0.2	<0.1	<0.1	<1.0	<0.1	<0.2
MW-17B	8010/8020		SEQ	02/25/89	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	<0.5	<0.5
MW-17B	8010/8020		SEQ	02/24/89	<0.5	<2.0	<2.0	<2.0	<2.0	<2.0	<10.0	<2.0	<1.0	<1.0
KMW-03B	8010/8020		SEQ	03/02/89	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	<0.5	<0.5
KMW-04A	8010/8020		SEQ	03/02/89	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	<0.5	<0.5

Table 4-4
Southern Pacific Transportation Company (Bayshore Yard)
Ground Water Organics Analyses
Report Form # 1

Sample Number	Test Method	QAQC Identification	Lab Code	Date Sampled	Benzene ug/l	Bromodichloro-methane ug/l	Bromoform ug/l	Bromo-methane ug/l	Carbontetra-chloride ug/l	Chloro-benzene ug/l	Chloro-ethane ug/l	2-Chloroethyl-vinyl ether ug/l	Chloroform ug/l	Chloromethane ug/l
KMW-05A	5030/8010		SEQ	03/09/89	- -	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	<0.5	<0.5
KMW-06B	5030/8010		SEQ	03/09/89	- -	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	<0.5	<0.5
KMW-06B	5030/8020		SEQ	03/09/89	<0.5	- -	- -	- -	- -	- -	- -	- -	- -	- -
KMW-07A	8010/8020		SEQ	03/02/89	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	<0.5	<0.5
DW-224	8010/8020	DITCH N20-2791	SEQ	02/26/89	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	<0.5	<0.5
DW-303	8010/8020	DITCH N20-0679	SEQ	03/03/89	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	<0.5	<0.5
DW-SS-1AF			CCA	/ /	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
DW-SS-2AF			CCA	/ /	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
BR 305	8010/8020	BRNSE-3/5-1119	SEQ	03/07/89	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	<0.5	<0.5
DCNWT	8010/8020	DECON WATER2-16	SEQ	02/18/89	<1.0	<2.0	<2.0	<2.0	<2.0	<2.0	<10.0	<2.0	13	<1.0
N-SUMP	601\602		CCA	04/22/86	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<1.0	<0.1	<0.2
S-SUMP	601\602	S-SUMP	CCA	04/29/86	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<1.0	<0.1	<0.2
TB-2009	601\602	TB-2009	CCA	04/22/86	0.4	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<1.0	<0.1	<0.2
TB-217	5030/8010	TB-217	SEQ	02/17/89	- -	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	<0.5	<0.5
TB-218	5030/8010	TB-218	SEQ	02/18/89	- -	<2.0	<2.0	<2.0	<2.0	<2.0	<10.0	<2.0	<1.0	<1.0
TB-223	8010/8020	TB-223	SEQ	02/23/89	0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	<0.5	<0.5
TB-224	8010/8020	TB-224	SEQ	02/24/89	<1.0	<2.0	<2.0	<2.0	<2.0	<2.0	<10.0	<2.0	<1.0	<1.0
TB-225	8010/8020	TB-225	SEQ	02/25/89	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	<0.5	<0.5

Table 4-4
Southern Pacific Transportation Company (Bayshore Yard)
Ground Water Organics Analyses
Report Form # 1

Sample Number	Test Method	QAQC Identification	Lab Code	Date Sampled	Benzene ug/l	Bromodichloro-methane ug/l	Bromoform ug/l	Bromo-methane ug/l	Carbontetra-chloride ug/l	Chloro-benzene ug/l	Chloro-ethane ug/l	2-Chloroethyl-vinyl ether ug/l	Chloroform ug/l	Chloromethane ug/l
TB-226	8010/8020	TB-226	SEQ	02/26/89	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	<0.5	<0.5
TB-302	8010/8020	TB-302	SEQ	03/02/89	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	<0.5	<0.5
TB-305	8010/8020	TB-305	SEQ	03/05/89	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<1.0	<0.5	<0.5
TB-309	5030/8010	TB-309	SEQ	03/09/89	<0.5	<1.0	<1.0	17	<1.0	<1.0	19	<1.0	<0.5	6.4
TB-417	601\602	TB - M-417	CCA	04/17/86	- -	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<1.0	<0.1	<0.2
TB-423	601\602	TB-M-423	CCA	04/23/86	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<1.0	<0.1	<0.2
TB-428	601\602	TB-M-428	CCA	04/28/86	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<1.0	<0.1	<0.2
TB-429	601\602	TB-M-429	CCA	04/29/86	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<1.0	<0.1	<0.2
TB-619	601\602	TB-M-619	CCA	06/19/86	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<1.0	<0.1	<0.2
TB-630	601\602	TB-630	CCA	06/30/86	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<1.0	<0.1	<0.2

Table 4-4 (cont)
Southern Pacific Transportation Company (Bayshore Yard)
Ground Water Organics Analyses
Report Form # 2

Sample Number	Test Method	QAQC Identification	Date Sampled	Dibromochloro-methane ug/l	1,2-Dichloro-benzene ug/l	1,3-Dichloro-benzene ug/l	1,4-Dichloro-benzene ug/l	1,1-Dichloro-ethane ug/l	1,2-Dichloro-ethane ug/l	1,1-Dichloro-ethene ug/l	trans-1,2-Di-chloroethene ug/l	1,2-Dichloro-propane ug/l
MK-01A	601\602		04/24/86	<0.1	<0.1	<0.1	<0.1	41	<0.1	<0.1	5.1	<0.1
MK-01A	8010/8020		02/26/89	<0.5	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.5
MK-02A	601\602		04/22/86	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
MK-02A	8010/8020		03/02/89	<0.5	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.5
MK-03B	601\602		04/22/86	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
MK-03B	8010/8020		03/07/89	<0.5	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.5
MK-04A	601\602		04/22/86	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
MK-04A	8010/8020		03/03/89	<0.5	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.5
MK-04B	601\602		04/22/86	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
MK-04B	8010/8020		03/03/89	<0.5	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.5
MK-05A	601\602		04/22/86	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
MK-05A	8010/8020		03/05/89	<0.5	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.5
MK-05B	601\602		04/22/86	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
MK-06A	601\602		04/23/86	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
MK-06A	8010/8020		03/03/89	<0.5	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.5
MK-06B	601\602		04/21/86	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
MK-06B	601\602	FDUPE MK-16B	04/29/86	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

Table 4-4 (cont)
Southern Pacific Transportation Company (Bayshore Yard)
Ground Water Organics Analyses
Report Form # 2

Sample Number	Test Method	QAQC Identification	Date Sampled	Dibromochloro-methane ug/l	1,2-Dichloro-benzene ug/l	1,3-Dichloro-benzene ug/l	1,4-Dichloro-benzene ug/l	1,1-Dichloro-ethane ug/l	1,2-Dichloro-ethane ug/l	1,1-Dichloro-ethene ug/l	trans-1,2-Di-chloroethene ug/l	1,2-Dichloro-propane ug/l
MK-06B	8010/8020		03/03/89	<0.5	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.5
MK-07A	601\602		04/28/86	<0.1	<0.1	<0.1	<0.1	1.2	<0.1	<0.1	<0.1	<0.1
MK-07A	8010/8020		02/17/89	<0.5	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.5
MK-07B	601\602		04/28/86	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
MK-07B	8010/8020		02/17/89	<0.5	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.5
MK-08A	601\602		04/24/86	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
MK-08A	8010/8020		02/23/89	<1.0	<4.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0
MK-09A	601\602		06/19/86	<0.1	<0.1	<0.1	<0.1	0.1	<0.1	<0.1	<0.1	<0.1
MK-09A	8010/8020		03/07/89	<0.5	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.5
MK-09B	601\602		06/19/86	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
MK-09B	8010/8020		03/07/89	<0.5	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.5
MK-09B	8010/8020	FDUPE MK-09B	03/07/89	<0.5	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.5
MK-22A	601\602	FDUPE-MK02-A	04/22/86	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
MW-10B	8010/8020		03/03/89	<0.5	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.5
MW-01B	601\602		04/24/86	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
MW-01B	8010/8020		02/26/89	<0.5	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.5
MW-02B	601\602		04/22/86	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
MW-02B	8010/8020		03/02/89	<0.5	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.5

Table 4-4 (cont)
Southern Pacific Transportation Company (Bayshore Yard)
Ground Water Organics Analyses
Report Form # 2

Sample Number	Test Method	QA/QC Identification	Date Sampled	Dibromochloro-methane ug/l	1,2-Dichloro-benzene ug/l	1,3-Dichloro-benzene ug/l	1,4-Dichloro-benzene ug/l	1,1-Dichloro-ethane ug/l	1,2-Dichloro-ethane ug/l	1,1-Dichloro-ethene ug/l	trans-1,2-Di-chloroethene ug/l	1,2-Dichloro-propane ug/l
MW-03A	601\602		04/22/86	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
MW-03A	8010/8020		03/07/89	<0.5	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.5
MW-04A	601\602		04/22/86	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
MW-04A	8010/8020		03/05/89	<25	<100	<50	<50	<50	<50	<50	<50	<25
MW-05A	601\602		04/17/86	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
MW-05A	601\602		06/30/86	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	830	<0.1
MW-05A	5030/8020		03/09/89	- -	- -	- -	- -	- -	- -	- -	- -	- -
MW-05B	601\602		04/17/86	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
MW-05B	601\602		06/30/86	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
MW-05B	5030/8010		03/09/89	<5.0	<20	<10	<10	<10	<10	<10	<10	<5.0
MW-05B	5030/8020		03/09/89	- -	- -	- -	- -	- -	- -	- -	- -	- -
MW-06A	601\602		04/17/86	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	59	<0.1
MW-06A	8010/8020		03/05/89	<25	<100	<50	<50	<50	<50	<50	790	<25
MW-06B	601\602		04/17/86	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
MW-06B	8010/8020		03/05/89	<0.5	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.5
MW-07A	601\602		04/17/86	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	632.9	<0.1
MW-08A	601\602		04/17/86	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	640	<0.1
MW-08A	8010/8020		03/05/89	<25	<100	<50	<50	<50	<50	<50	980	<25

Table 4-4 (cont)
Southern Pacific Transportation Company (Bayshore Yard)
Ground Water Organics Analyses
Report Form # 2

Sample Number	Test Method	QAQC Identification	Date Sampled	Dibromochloro-methane ug/l	1,2-Dichloro-benzene ug/l	1,3-Dichloro-benzene ug/l	1,4-Dichloro-benzene ug/l	1,1-Dichloro-ethane ug/l	1,2-Dichloro-ethane ug/l	1,1-Dichloro-ethene ug/l	trans-1,2-Di-chloroethene ug/l	1,2-Dichloro-propane ug/l
MW-08B	8010/8020		03/05/89	<0.5	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.5
MW-09A	601\602		04/23/86	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	2.5	<0.1
MW-09A	8010/8020		03/03/89	<0.5	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	12	<0.5
MW-09B	601\602		04/17/86	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
MW-09B	601\602		04/22/86	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
MW-09B	8010/8020		03/03/89	<0.5	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.5
MW-10A	601\602		04/28/86	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
MW-10A	8010/8020		02/17/89	<0.5	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.5
MW-10B	601\602		04/28/86	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
MW-11A	601\602		04/23/86	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
MW-11A	601\602	FDUPE-MW-111A	04/21/86	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
MW-11B	601\602		04/23/86	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
MW-11B	8010/8020		03/05/89	<0.5	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.5
MW-12B	601\602		04/24/86	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
MW-13A	601\602		04/29/86	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
MW-13A	8010/8020		02/18/89	<1.0	<4.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0
MW-13B	601\602		04/29/86	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
MW-13B	8010/8020		02/18/89	<1.0	<4.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0

Table 4-4 (cont)
Southern Pacific Transportation Company (Bayshore Yard)
Ground Water Organics Analyses
Report Form # 2

Sample Number	Test Method	QAQC Identification	Date Sampled	Dibromochloro-methane ug/l	1,2-Dichloro-benzene ug/l	1,3-Dichloro-benzene ug/l	1,4-Dichloro-benzene ug/l	1,1-Dichloro-ethane ug/l	1,2-Dichloro-ethane ug/l	1,1-Dichloro-ethene ug/l	trans-1,2-Di-chloroethene ug/l	1,2-Dichloro-propane ug/l
MW-14A	601\602		04/29/86	<0.1	<0.1	<0.1	<0.1	0.2	<0.1	<0.1	<0.1	<0.1
MW-14B	601\602		04/29/86	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
MW-15A	601\602		04/29/86	<0.1	<0.1	<0.1	<0.1	1.7	<0.1	<0.1	0.9	<0.1
MW-15A	8010/8020		02/25/89	<0.5	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.5
MW-15A	5030/8010		03/09/89	<2500	<10000	<5000	<5000	<5000	<5000	<5000	<5000	<2500
MW-15A	5030/8020		03/09/89	- -	- -	- -	- -	- -	- -	- -	- -	- -
MW-16A	601\602		04/29/86	<0.1	<0.1	<0.1	<0.1	0.8	<0.1	<0.1	0.6	<0.1
MW-16A	8010/8020		02/25/89	<0.5	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.5
MW-16B	601\602		04/29/86	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
MW-16B	8010/8020		02/25/89	<0.5	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.5
MW-17A	601\602		04/28/86	<0.1	<0.1	<0.1	<0.1	1.4	<0.1	<0.1	1.5	<0.1
MW-17A	8010/8020		02/25/89	<0.5	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.5
MW-17A	8010/8020		02/24/89	<1.0	<4.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0
MW-17B	601\602		04/28/86	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
MW-17B	8010/8020		02/25/89	<0.5	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.5
MW-17B	8010/8020		02/24/89	<1.0	<4.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0
KMW-03B	8010/8020		03/02/89	<0.5	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.5
KMW-04A	8010/8020		03/02/89	<0.5	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.5

Table 4-4 (cont)
Southern Pacific Transportation Company (Bayshore Yard)
Ground Water Organics Analyses
Report Form # 2

Sample Number	Test Method	QAQC Identification	Date Sampled	Dibromochloro-methane ug/l	1,2-Dichloro-benzene ug/l	1,3-Dichloro-benzene ug/l	1,4-Dichloro-benzene ug/l	1,1-Dichloro-ethane ug/l	1,2-Dichloro-ethane ug/l	1,1-Dichloro-ethene ug/l	trans-1,2-Di-chloroethene ug/l	1,2-Dichloro-propane ug/l
KMW-05A	5030/8010		03/09/89	<0.5	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.5
KMW-06B	5030/8010		03/09/89	<0.5	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.5
KMW-06B	5030/8020		03/09/89	- -	- -	- -	- -	- -	- -	- -	- -	- -
KMW-07A	8010/8020		03/02/89	<0.5	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.5
DW-224	8010/8020	DITCH N20-2791	02/26/89	<0.5	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.5
DW-303	8010/8020	DITCH N20-0679	03/03/89	<0.5	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.5
DW-SS-1AF			/ /	- -	- -	- -	- -	- -	- -	- -	- -	- -
DW-SS-2AF			/ /	- -	- -	- -	- -	- -	- -	- -	- -	- -
BR 305	8010/8020	BRNSE-3/5-1119	03/07/89	<0.5	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.5
DCNWT	8010/8020	DECON WATER2-16	02/18/89	<1.0	<4.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0
N-SUMP	601\602		04/22/86	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
S-SUMP	601\602	S-SUMP	04/29/86	<0.1	<0.1	<0.1	<0.1	0.3	<0.1	<0.1	<0.1	<0.1
TB-2009	601\602	TB-2009	04/22/86	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TB-217	5030/8010	TB-217	02/17/89	<0.5	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.5
TB-218	5030/8010	TB-218	02/18/89	<1.0	<4.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0
TB-223	8010/8020	TB-223	02/23/89	<0.5	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.5
TB-224	8010/8020	TB-224	02/24/89	<1.0	<4.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0
TB-225	8010/8020	TB-225	02/25/89	<0.5	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.5

Table 4-4 (cont)
Southern Pacific Transportation Company (Bayshore Yard)
Ground Water Organics Analyses
Report Form # 2

Sample Number	Test Method	QAQC Identification	Date Sampled	Dibromochloro-methane ug/l	1,2-Dichloro-benzene ug/l	1,3-Dichloro-benzene ug/l	1,4-Dichloro-benzene ug/l	1,1-Dichloro-ethane ug/l	1,2-Dichloro-ethane ug/l	1,1-Dichloro-ethene ug/l	trans-1,2-Di-chloroethene ug/l	1,2-Dichloro-propane ug/l
TB-226	8010/8020	TB-226	02/26/89	<0.5	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.5
TB-302	8010/8020	TB-302	03/02/89	<0.5	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.5
TB-305	8010/8020	TB-305	03/05/89	<0.5	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	21	<0.5
TB-309	5030/8010	TB-309	03/09/89	<0.5	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.5
TB-417	601\602	TB - M-417	04/17/86	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TB-423	601\602	TB-M-423	04/23/86	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TB-428	601\602	TB-M-428	04/28/86	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TB-429	601\602	TB-M-429	04/29/86	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TB-619	601\602	TB-M-619	06/19/86	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TB-630	601\602	TB-630	06/30/86	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

Table 4-4 (cont)
Southern Pacific Transportation Company (Bayshore Yard)
Ground Water Organics Analyses
Report Form # 3

Sample Number	Test Method	QAQC Identification	Date Sampled	cis-1,3 Dichloro-propylene ug/l	trans-1,3-Dichloro-propylene ug/l	Ethyl Benzene ug/l	Methylene chloride ug/l	1,1,2,2-Tetra-chloroethane ug/l	Tetrachloro-ethylene ug/l	Toluene ug/l	1,1,1-Tri-chloroethane ug/l	1,1,2-Tri-chloroethane ug/l
MK-01A	601\602		04/24/86	<0.1	<0.1	<0.1	<10	<0.5	<0.5	<0.2	<0.1	<0.1
MK-01A	8010/8020		02/26/89	<0.5	<5.0	<0.5	<2.0	<0.5	<0.5	<0.5	<0.5	<0.5
MK-02A	601\602		04/22/86	<0.1	<0.1	<0.1	<10	<0.5	<0.5	<0.2	<0.1	<0.1
MK-02A	8010/8020		03/02/89	<0.5	<5.0	<0.5	<2.0	<0.5	<1.0	<0.5	<0.5	<0.5
MK-03B	601\602		04/22/86	<0.1	<0.1	<0.1	<10	<0.5	<0.5	<0.2	<0.1	<0.1
MK-03B	8010/8020		03/07/89	<0.5	<5.0	<0.5	<2.0	<0.5	<0.5	<0.5	<0.5	<0.5
MK-04A	601\602		04/22/86	<0.1	<0.1	0.5	<10	<0.5	<0.5	1.2	<0.1	<0.1
MK-04A	8010/8020		03/03/89	<0.5	<5.0	<0.5	<2.0	<0.5	<0.5	<0.5	<0.5	<0.5
MK-04B	601\602		04/22/86	<0.1	<0.1	<0.1	<10	<0.5	<0.5	<0.2	<0.1	<0.1
MK-04B	8010/8020		03/03/89	<0.5	<5.0	<0.5	<2.0	<0.5	<0.5	<0.5	<0.5	<0.5
MK-05A	601\602		04/22/86	<0.1	<0.1	<0.1	500	<0.5	<0.5	<0.2	<0.1	<0.1
MK-05A	8010/8020		03/05/89	<0.5	<5.0	<0.5	3.0	<0.5	<0.5	<0.5	<0.5	<0.5
MK-05B	601\602		04/22/86	<0.1	<0.1	<0.1	<10	<0.5	<0.5	<0.2	<0.1	<0.1
MK-06A	601\602		04/23/86	<0.1	<0.1	<0.1	<10	<0.5	<0.5	<0.2	<0.1	<0.1
MK-06A	8010/8020		03/03/89	<0.5	<5.0	<0.5	<2.0	<0.5	<0.5	<0.5	<0.5	<0.5
MK-06B	601\602		04/21/86	<0.1	<0.1	<0.1	<10	<0.5	<0.5	<0.2	<0.1	<0.1
MK-06B	601\602	FDUPE MK-16B	04/29/86	<0.1	<0.1	<0.1	<10	<0.5	<0.5	<0.2	<0.1	<0.1

Table 4-4 (cont)
Southern Pacific Transportation Company (Bayshore Yard)
Ground Water Organics Analyses
Report Form # 3

Sample Number	Test Method	QAQC Identification	Date Sampled	cis-1,3 Dichloro-propylene ug/l	trans-1,3-Dichloro-propylene ug/l	Ethyl Benzene ug/l	Methylene chloride ug/l	1,1,2,2-Tetra-chloroethane ug/l	Tetrachloro-ethylene ug/l	Toluene ug/l	1,1,1-Tri-chloroethane ug/l	1,1,2-Tri-chloroethane ug/l
MK-06B	8010/8020		03/03/89	<0.5	<5.0	<0.5	<2.0	<0.5	<0.5	<0.5	<0.5	<0.5
MK-07A	601\602		04/28/86	<0.1	<0.1	<0.1	<10	<0.5	<0.5	<0.2	<0.1	<0.1
MK-07A	8010/8020		02/17/89	<0.5	<5.0	<0.5	<2.0	<0.5	<0.5	<0.5	<0.5	<0.5
MK-07B	601\602		04/28/86	<0.1	<0.1	<0.1	<10	<0.5	<0.5	<0.2	<0.1	<0.1
MK-07B	8010/8020		02/17/89	<0.5	<5.0	<0.5	<2.0	<0.5	<0.5	<0.5	<0.5	<0.5
MK-08A	601\602		04/24/86	<0.1	<0.1	<0.1	<10	<0.5	3.5	<0.2	0.2	<0.1
MK-08A	8010/8020		02/23/89	<1.0	<10	<1.0	<4.0	<1.0	2.9	<1.0	<1.0	<1.0
MK-09A	601\602		06/19/86	<0.1	<0.1	<0.1	<10	<0.5	<0.5	<0.2	<0.1	<0.1
MK-09A	8010/8020		03/07/89	<0.5	<5.0	<0.5	<2.0	<0.5	<0.5	<0.5	<0.5	<0.5
MK-09B	601\602		06/19/86	<0.1	<0.1	0.1	<10	<0.5	<0.5	<0.2	<0.1	<0.1
MK-09B	8010/8020		03/07/89	<0.5	<5.0	<0.5	<2.0	<0.5	<0.5	<0.5	<0.5	<0.5
MK-09B	8010/8020	FDUPE MK-09B	03/07/89	<0.5	<5.0	<0.5	<2.0	<0.5	<0.5	<0.5	<0.5	<0.5
MK-22A	601\602	FDUPE-MK02-A	04/22/86	<0.1	<0.1	<0.1	<10	<0.5	<0.5	<0.2	<0.1	<0.1
MW-10B	8010/8020		03/03/89	<0.5	<5.0	<0.5	<2.0	<0.5	<0.5	<0.5	<0.5	<0.5
MW-01B	601\602		04/24/86	<0.1	<0.1	<0.1	<10	<0.5	<0.5	<0.2	<0.1	<0.1
MW-01B	8010/8020		02/26/89	<0.5	<5.0	<0.5	<2.0	<0.5	<0.5	<0.5	<0.5	<0.5
MW-02B	601\602		04/22/86	<0.1	<0.1	0.4	<10	<0.5	<0.5	<0.2	<0.1	<0.1
MW-02B	8010/8020		03/02/89	<0.5	<5.0	<0.5	<2.0	<0.5	<0.5	<0.5	<0.5	<0.5

Table 4-4 (cont)
Southern Pacific Transportation Company (Bayshore Yard)
Ground Water Organics Analyses
Report Form # 3

Sample Number	Test Method	QAQC Identification	Date Sampled	cis-1,3 Dichloro-propylene ug/l	trans-1,3-Dichloro-propylene ug/l	Ethyl Benzene ug/l	Methylene chloride ug/l	1,1,2,2-Tetra-chloroethane ug/l	Tetrachloro-ethylene ug/l	Toluene ug/l	1,1,1-Tri-chloroethane ug/l	1,1,2-Tri-chloroethane ug/l
MW-03A	601\602		04/22/86	<0.1	<0.1	0.5	<10	<0.5	<0.5	0.9	<0.1	<0.1
MW-03A	8010/8020		03/07/89	<0.5	<5.0	<0.5	<2.0	<0.5	<0.5	<0.5	<0.5	<0.5
MW-04A	601\602		04/22/86	<0.1	<0.1	<0.1	<10	<0.5	<0.5	<0.2	<0.1	<0.1
MW-04A	8010/8020		03/05/89	<25	<250	<25	<100	<25	<25	<25	<25	<25
MW-05A	601\602		04/17/86	<0.1	<0.1	<0.1	<10	<0.5	48000	<0.2	<0.1	<0.1
MW-05A	601\602		06/30/86	<0.1	<0.1	<0.1	<10	<0.5	8700	<0.2	47	130
MW-05A	5030/8020		03/09/89	- -	- -	<0.5	- -	- -	- -	<0.5	- -	- -
MW-05B	601\602		04/17/86	<0.1	0.20	<0.1	<10	<0.5	<0.5	0.2	<0.1	<0.1
MW-05B	601\602		06/30/86	<0.1	<0.1	<0.1	<10	<0.5	<0.5	<0.2	<0.1	<0.1
MW-05B	5030/8010		03/09/89	<5.0	<50	- -	<20	<5.0	<5.0	- -	<5.0	<5.0
MW-05B	5030/8020		03/09/89	- -	- -	<0.5	- -	- -	- -	<0.5	- -	- -
MW-06A	601\602		04/17/86	<0.1	<0.1	0.10	<10	<0.5	6.0	<0.2	<0.1	<0.1
MW-06A	8010/8020		03/05/89	<25	<250	<25	<100	<25	150	<25	<25	<25
MW-06B	601\602		04/17/86	<0.1	<0.1	<0.1	<10	<0.5	3.1	<0.2	<0.1	<0.1
MW-06B	8010/8020		03/05/89	<0.5	<5.0	<0.5	5.0	<0.5	1.9	<0.5	<0.5	<0.5
MW-07A	601\602		04/17/86	<0.1	<0.1	<0.1	<10	1.8	76	0.6	<0.1	<0.1
MW-08A	601\602		04/17/86	<0.1	<0.1	<0.1	<10	<0.5	<0.5	<0.2	<0.1	<0.1
MW-08A	8010/8020		03/05/89	<25	<250	<25	<100	<25	<25	<25	<25	<25

Table 4-4 (cont)
Southern Pacific Transportation Company (Bayshore Yard)
Ground Water Organics Analyses
Report Form # 3

Sample Number	Test Method	QAQC Identification	Date Sampled	cis-1,3 Dichloro-propylene ug/l	trans-1,3-Dichloro-propylene ug/l	Ethyl Benzene ug/l	Methylene chloride ug/l	1,1,2,2-Tetra-chloroethane ug/l	Tetrachloro-ethylene ug/l	Toluene ug/l	1,1,1-Tri-chloroethane ug/l	1,1,2-Tri-chloroethane ug/l
MW-08B	8010/8020		03/05/89	<0.5	<5.0	<0.5	<2.0	<0.5	<0.5	<0.5	<0.5	<0.5
MW-09A	601\602		04/23/86	<0.1	<0.1	<0.1	<10	<0.5	<0.5	<0.2	<0.1	<0.1
MW-09A	8010/8020		03/03/89	<0.5	<5.0	<0.5	<2.0	<0.5	<0.5	<0.5	<0.5	<0.5
MW-09B	601\602		04/17/86	<0.1	<0.1	<0.1	<10	<0.5	<0.5	<0.2	<0.1	<0.1
MW-09B	601\602		04/22/86	<0.1	<0.1	<0.1	<10	<0.5	<0.5	<0.2	<0.1	<0.1
MW-09B	8010/8020		03/03/89	<0.5	<5.0	<0.5	<2.0	<0.5	<0.5	<0.5	<0.5	<0.5
MW-10A	601\602		04/28/86	<0.1	<0.1	<0.1	<10	<0.5	<0.5	<0.2	<0.1	<0.1
MW-10A	8010/8020		02/17/89	<0.5	<5.0	<0.5	<2.0	<0.5	<0.5	<0.5	<0.5	<0.5
MW-10B	601\602		04/28/86	<0.1	<0.1	0.2	<10	<0.5	<0.5	0.6	<0.1	<0.1
MW-11A	601\602		04/23/86	<0.1	<0.1	<0.1	<10	<0.5	<0.5	<0.2	<0.1	<0.1
MW-11A	601\602	FDUPE-MW-111A	04/21/86	<0.1	<0.1	<0.1	<10	<0.5	<0.5	<0.2	<0.1	<0.1
MW-11B	601\602		04/23/86	<0.1	<0.1	<0.1	<10	<0.5	<0.5	<0.2	<0.1	<0.1
MW-11B	8010/8020		03/05/89	<0.5	<5.0	<0.5	<2.0	<0.5	<0.5	<0.5	<0.5	<0.5
MW-12B	601\602		04/24/86	<0.1	<0.1	<0.1	<10	<0.5	<0.5	0.1	<0.1	<0.1
MW-13A	601\602		04/29/86	<0.1	<0.1	0.9	<10	<0.5	<0.5	<0.2	<0.1	<0.1
MW-13A	8010/8020		02/18/89	<1.0	<10	9.1	<4.0	<1.0	<1.0	2.2	<1.0	<1.0
MW-13B	601\602		04/29/86	<0.1	<0.1	<0.1	<10	<0.5	<0.5	<0.2	<0.1	<0.1
MW-13B	8010/8020		02/18/89	<1.0	<10	<1.0	<4.0	<1.0	<1.0	<1.0	<1.0	<1.0

Table 4-4 (cont)
Southern Pacific Transportation Company (Bayshore Yard)
Ground Water Organics Analyses
Report Form # 3

Sample Number	Test Method	QAQC Identification	Date Sampled	cis-1,3 Dichloropropylene ug/l	trans-1,3-Dichloropropylene ug/l	Ethyl Benzene ug/l	Methylene chloride ug/l	1,1,2,2-Tetrachloroethane ug/l	Tetrachloroethylene ug/l	Toluene ug/l	1,1,1-Trichloroethane ug/l	1,1,2-Trichloroethane ug/l
MW-14A	601\602		04/29/86	<0.1	<0.1	<0.1	<10	<0.5	<0.5	<0.2	<0.1	<0.1
MW-14B	601\602		04/29/86	<0.1	<0.1	0.1	<10	<0.5	<0.5	<0.2	<0.1	<0.1
MW-15A	601\602		04/29/86	<0.1	<0.1	<0.1	<10	<0.5	<0.5	0.7	<0.1	13
MW-15A	8010/8020		02/25/89	<0.5	<5.0	1.0	<2.0	<0.5	<0.5	<0.5	<0.5	<0.5
MW-15A	5030/8010		03/09/89	<2500	<25000	- -	<10000	<2500	<2500	- -	<2500	<2500
MW-15A	5030/8020		03/09/89	- -	- -	<0.5	- -	- -	- -	<0.5	- -	- -
MW-16A	601\602		04/29/86	<0.1	<0.1	<0.1	<10	<0.5	<0.5	<0.2	<0.1	<0.1
MW-16A	8010/8020		02/25/89	<0.5	<5.0	<0.5	<2.0	<0.5	<0.5	<0.5	<0.5	<0.5
MW-16B	601\602		04/29/86	<0.1	<0.1	<0.1	<10	<0.5	<0.5	<0.2	<0.1	<0.1
MW-16B	8010/8020		02/25/89	<0.5	<5.0	<0.5	<2.0	<0.5	<0.5	<0.5	<0.5	<0.5
MW-17A	601\602		04/28/86	<0.1	<0.1	<0.1	<10	<0.5	<0.5	0.1	<0.1	<0.1
MW-17A	8010/8020		02/25/89	<0.5	<5.0	<0.5	<2.0	<0.5	<0.5	<0.5	<0.5	<0.5
MW-17A	8010/8020		02/24/89	<1.0	<10	<1.0	<4.0	<1.0	<1.0	<1.0	<1.0	<1.0
MW-17B	601\602		04/28/86	<0.1	<0.1	0.2	<10	<0.5	<0.5	0.2	0.10	<0.1
MW-17B	8010/8020		02/25/89	<0.5	<5.0	<0.5	<2.0	<0.5	<0.5	<0.5	<0.5	<0.5
MW-17B	8010/8020		02/24/89	<1.0	<10	<0.5	<4.0	<1.0	<1.0	<0.5	<1.0	<1.0
KMW-03B	8010/8020		03/02/89	<0.5	<5.0	<0.5	<2.0	<0.5	<0.5	<0.5	<0.5	<0.5
KMW-04A	8010/8020		03/02/89	<0.5	<5.0	<0.5	<2.0	<0.5	<0.5	<0.5	<0.5	<0.5

Table 4-4 (cont)
Southern Pacific Transportation Company (Bayshore Yard)
Ground Water Organics Analyses
Report Form #.3

Sample Number	Test Method	QAQC Identification	Date Sampled	cis-1,3 Dichloro-propylene ug/l	trans-1,3-Dichloro-propylene ug/l	Ethyl Benzene ug/l	Methylene chloride ug/l	1,1,2,2-Tetra-chloroethane ug/l	Tetrachloro-ethylene ug/l	Toluene ug/l	1,1,1-Tri-chloroethane ug/l	1,1,2-Tri-chloroethane ug/l
KMW-05A	5030/8010		03/09/89	<0.5	<5.0	- -	<2.0	<0.5	<0.5	- -	<0.5	<0.5
KMW-06B	5030/8010		03/09/89	<0.5	<5.0	- -	<2.0	<0.5	<0.5	- -	<0.5	<0.5
KMW-06B	5030/8020		03/09/89	- -	- -	<0.5	- -	- -	- -	<0.5	- -	- -
KMW-07A	8010/8020		03/02/89	<0.5	<5.0	<0.5	<2.0	<0.5	<0.5	<0.5	<0.5	<0.5
DW-224	8010/8020	DITCH H2O-2791	02/26/89	<0.5	<5.0	<0.5	<2.0	<0.5	<0.5	<0.5	<0.5	<0.5
DW-303	8010/8020	DITCH H2O-0679	03/03/89	<0.5	<5.0	<0.5	<2.0	<0.5	<0.5	<0.5	<0.5	<0.5
DW-SS-1AF			/ /	- -	- -	- -	- -	- -	- -	- -	- -	- -
DW-SS-2AF			/ /	- -	- -	- -	- -	- -	- -	- -	- -	- -
BR 305	8010/8020	BRNSE-3/5-1119	03/07/89	<0.5	<5.0	<0.5	<2.0	<0.5	<0.5	<0.5	<0.5	<0.5
DCNWT	8010/8020	DECON WATER2-16	02/18/89	<1.0	<10	<1.0	<4.0	<1.0	<1.0	<1.0	<1.0	<1.0
N-SUMP	601\602		04/22/86	<0.1	<0.1	<0.1	<10	<0.5	<0.5	<0.2	<0.1	<0.1
S-SUMP	601\602	S-SUMP	04/29/86	<0.1	<0.1	<0.1	<10	<0.5	<0.5	<0.2	<0.1	<0.1
TB-2009	601\602	TB-2009	04/22/86	<0.1	<0.1	0.5	<10	<0.5	<0.5	2.8	<0.1	<0.1
TB-217	5030/8010	TB-217	02/17/89	<0.5	<5.0	- -	<2.0	<0.5	<0.5	- -	<0.5	<0.5
TB-218	5030/8010	TB-218	02/18/89	<1.0	<10	- -	<4.0	<1.0	<1.0	- -	<1.0	<1.0
TB-223	8010/8020	TB-223	02/23/89	<0.5	<5.0	<0.5	<2.0	<0.5	<0.5	<0.5	<0.5	<0.5
TB-224	8010/8020	TB-224	02/24/89	<1.0	<10	<1.0	<4.0	<1.0	<1.0	<1.0	<1.0	<1.0
TB-225	8010/8020	TB-225	02/25/89	<0.5	<5.0	<0.5	<2.0	<0.5	<0.5	<0.5	<0.5	<0.5

Table 4-4 (cont)
Southern Pacific Transportation Company (Bayshore Yard)
Ground Water Organics Analyses
Report Form # 3

Sample Number	Test Method	QAQC Identification	Date Sampled	cis-1,3 Dichloro-propylene ug/l	trans-1,3-Dichloro-propylene ug/l	Ethyl Benzene ug/l	Methylene chloride ug/l	1,1,2,2-Tetra-chloroethane ug/l	Tetrachloro-ethylene ug/l	Toluene ug/l	1,1,1-Tri-chloroethane ug/l	1,1,2-Tri-chloroethane ug/l
TB-226	8010/8020	TB-226	02/26/89	<0.5	<5.0	<0.5	<2.0	<0.5	<0.5	<0.5	<0.5	<0.5
TB-302	8010/8020	TB-302	03/02/89	<0.5	<5.0	<0.5	<2.0	<0.5	<0.5	<0.5	<0.5	<0.5
TB-305	8010/8020	TB-305	03/05/89	<0.5	<5.0	<0.5	<2.0	<0.5	<0.5	<0.5	<0.5	<0.5
TB-309	5030/8010	TB-309	03/09/89	<0.5	<5.0	<0.5	<2.0	<0.5	<0.5	<0.5	<0.5	<0.5
TB-417	601\602	TB - M-417	04/17/86	<0.1	<0.1	<0.1	<10	<0.5	<0.5	<0.2	<0.1	<0.1
TB-423	601\602	TB-M-423	04/23/86	<0.1	<0.1	<0.1	<10	<0.5	<0.5	0.1	<0.1	<0.1
TB-428	601\602	TB-M-428	04/28/86	<0.1	<0.1	<0.1	<10	<0.5	<0.5	<0.2	<0.1	<0.1
TB-429	601\602	TB-M-429	04/29/86	<0.1	<0.1	<0.1	<10	<0.5	<0.5	<0.2	<0.1	<0.1
TB-619	601\602	TB-M-619	06/19/86	<0.1	<0.1	<0.1	<10	<0.5	<0.5	<0.2	<0.1	<0.1
TB-630	601\602	TB-630	06/30/86	<0.1	<0.1	<0.1	<10	<0.5	<0.5	<0.2	<0.1	<0.1

Table 4-4 (cont)
Southern Pacific Transportation Company (Bayshore Yard)
Ground Water Organics Analyses
Report Form # 4

Sample Number	Test Method	QAQC Identification	Date Sampled	Trichloro-ethylene ug/l	Trichloro-fluormethane ug/l	Vinyl Chloride ug/l	Total Xylene ug/l	Total Petroleum Hydrocarbons mg/l
MK-01A	601\602		04/24/86	1.2	<0.1	<0.1	<0.1	- -
MK-01A	8010/8020		02/26/89	<0.5	<1.0	<2.0	<0.5	17
MK-02A	601\602		04/22/86	<0.1	<0.1	<0.1	<0.1	- -
MK-02A	8010/8020		03/02/89	<0.5	<1.0	<2.0	<0.5	- -
MK-03B	601\602		04/22/86	<0.1	<0.1	<0.1	0.6	- -
MK-03B	8010/8020		03/07/89	<0.5	<1.0	<2.0	<0.5	- -
MK-04A	601\602		04/22/86	<0.1	<0.1	<0.1	3.8	- -
MK-04A	8010/8020		03/03/89	<0.5	<1.0	<2.0	<0.5	- -
MK-04B	601\602		04/22/86	1	<0.1	<0.1	<0.1	- -
MK-04B	8010/8020		03/03/89	<0.5	<1.0	<2.0	<0.5	- -
MK-05A	601\602		04/22/86	<0.1	<0.1	<0.1	<0.1	- -
MK-05A	8010/8020		03/05/89	<0.5	<1.0	<2.0	<0.5	- -
MK-05B	601\602		04/22/86	<0.1	<0.1	<0.1	<0.1	- -
MK-06A	601\602		04/23/86	<0.1	<0.1	<0.1	<0.1	- -
MK-06A	8010/8020		03/03/89	<0.5	<1.0	<2.0	<0.5	- -
MK-06B	601\602		04/21/86	<0.1	<0.1	<0.1	<0.1	- -
MK-06B	601\602	FDUPE MK-16B	04/29/86	<0.1	<0.1	<0.1	<0.1	- -

Table 4-4 (cont)
Southern Pacific Transportation Company (Bayshore Yard)
Ground Water Organics Analyses
Report Form # 4

Sample Number	Test Method	QAQC Identification	Date Sampled	Trichloro-ethylene ug/l	Trichloro-fluoromethane ug/l	Vinyl Chloride ug/l	Total Xylene ug/l	Total Petroleum Hydrocarbons mg/l
MK-06B	8010/8020		03/03/89	<0.5	<1.0	<2.0	<0.5	- -
MK-07A	601\602		04/28/86	<0.1	<0.1	<0.1	<0.1	- -
MK-07A	8010/8020		02/17/89	<0.5	<1.0	<2.0	<0.5	<1
MK-07B	601\602		04/28/86	<0.1	<0.1	<0.1	<0.1	- -
MK-07B	8010/8020		02/17/89	<0.5	<1.0	<2.0	<0.5	<1
MK-08A	601\602		04/24/86	<0.1	<0.1	<0.1	<0.1	- -
MK-08A	8010/8020		02/23/89	<1.0	<2.0	<4.0	<1.0	- -
MK-09A	601\602		06/19/86	<0.1	<0.1	<0.1	<0.1	- -
MK-09A	8010/8020		03/07/89	<0.5	<1.0	<2.0	<0.5	- -
MK-09B	601\602		06/19/86	<0.1	<0.1	<0.1	0.8	- -
MK-09B	8010/8020		03/07/89	<0.5	<1.0	<2.0	<0.5	- -
MK-09B	8010/8020	FDUPE MK-09B	03/07/89	<0.5	<1.0	<2.0	<0.5	- -
MK-22A	601\602	FDUPE-MK02-A	04/22/86	15	<0.1	<0.1	2.3	- -
MW-10B	8010/8020		03/03/89	<0.5	<1.0	<2.0	<0.5	- -
MW-01B	601\602		04/24/86	<0.1	<0.1	<0.1	<0.1	- -
MW-01B	8010/8020		02/26/89	<0.5	<1.0	<2.0	<0.5	- -
MW-02B	601\602		04/22/86	<0.1	<0.1	<0.1	1.6	- -
MW-02B	8010/8020		03/02/89	<0.5	<1.0	<2.0	<0.5	- -

Table 4-4 (cont)
Southern Pacific Transportation Company (Bayshore Yard)
Ground Water Organics Analyses
Report Form # 4

Sample Number	Test Method	QAQC Identification	Date Sampled	Trichloro-ethylene ug/l	Trichloro-fluoromethane ug/l	Vinyl Chloride ug/l	Total Xylene ug/l	Total Petroleum Hydrocarbons mg/l
MW-03A	601\602		04/22/86	<0.1	<0.1	<0.1	3.2	- -
MW-03A	8010/8020		03/07/89	<0.5	<1.0	<2.0	<0.5	- -
MW-04A	601\602		04/22/86	<0.1	<0.1	<0.1	<0.1	- -
MW-04A	8010/8020		03/05/89	1100	<50	<100	<25	- -
MW-05A	601\602		04/17/86	1000000	<0.1	<0.1	<0.1	- -
MW-05A	601\602		06/30/86	140000	<0.1	<0.1	<0.1	- -
MW-05A	5030/8020		03/09/89	- -	- -	- -	<0.5	- -
MW-05B	601\602		04/17/86	44	<0.1	<0.1	<0.1	- -
MW-05B	601\602		06/30/86	7	<0.1	<0.1	<0.1	- -
MW-05B	5030/8010		03/09/89	110	<10	<20	- -	- -
MW-05B	5030/8020		03/09/89	- -	- -	- -	<0.5	- -
MW-06A	601\602		04/17/86	79	<0.1	<0.1	<0.1	- -
MW-06A	8010/8020		03/05/89	2100	<50	<100	<25	- -
MW-06B	601\602		04/17/86	18	<0.1	<0.1	<0.1	- -
MW-06B	8010/8020		03/05/89	43	<1.0	<2.0	<0.5	- -
MW-07A	601\602		04/17/86	340	<0.1	<0.1	<0.1	- -
MW-08A	601\602		04/17/86	<0.1	<0.1	<0.1	<0.1	- -
MW-08A	8010/8020		03/05/89	<25	<50	<100	<25	- -

Table 4-4 (cont)
Southern Pacific Transportation Company (Bayshore Yard)
Ground Water Organics Analyses
Report Form # 4

Sample Number	Test Method	QAQC Identification	Date Sampled	Trichloro-ethylene ug/l	Trichloro-fluoromethane ug/l	Vinyl Chloride ug/l	Total Xylene ug/l	Total Petroleum Hydrocarbons mg/l
MW-08B	8010/8020		03/05/89	<0.5	<1.0	<2.0	<0.5	- -
MW-09A	601\602		04/23/86	<0.1- -	<0.1	<0.1	<0.1	- -
MW-09A	8010/8020		03/03/89	<0.5	<1.0	<2.0	<0.5	- -
MW-09B	601\602		04/17/86	<0.5	<0.1	<0.1	<0.1	- -
MW-09B	601\602		04/22/86	<0.1	<0.1	<0.1	<0.1	- -
MW-09B	8010/8020		03/03/89	<0.5	<1.0	<2.0	<0.5	- -
MW-10A	601\602		04/28/86	<0.1	<0.1	<0.1	<0.1	- -
MW-10A	8010/8020		02/17/89	<0.5	<1.0	<2.0	<0.5	- -
MW-10B	601\602		04/28/86	<0.1	<0.1	<0.1	0.3	- -
MW-11A	601\602		04/23/86	<0.1	<0.1	<0.1	<0.1	- -
MW-11A	601\602	FDUPE-MW-111A	04/21/86	<0.1	<0.1	<0.1	<0.1	- -
MW-11B	601\602		04/23/86	<0.1	<0.1	<0.1	<0.1	- -
MW-11B	8010/8020		03/05/89	<0.5	<1.0	<2.0	<0.5	- -
MW-12B	601\602		04/24/86	<0.1	<0.1	<0.1	<0.1	- -
MW-13A	601\602		04/29/86	<0.1	<0.1	<0.1	2.1	- -
MW-13A	8010/8020		02/18/89	<1.0	<2.0	<4.0	47	120
MW-13B	601\602		04/29/86	<0.1	<0.1	<0.1	0.6	- -
MW-13B	8010/8020		02/18/89	<1.0	<2.0	<4.0	<1.0	<1

Table 4-4 (cont)
Southern Pacific Transportation Company (Bayshore Yard)
Ground Water Organics Analyses
Report Form # 4

Sample Number	Test Method	QAQC Identification	Date Sampled	Trichloro-ethylene ug/l	Trichloro-fluoromethane ug/l	Vinyl Chloride ug/l	Total Xylene ug/l	Total Petroleum Hydrocarbons mg/l
MW-14A	601\602		04/29/86	<0.1	<0.1	<0.1	0.6	- -
MW-14B	601\602		04/29/86	<0.1	<0.1	<0.1	<0.1	- -
MW-15A	601\602		04/29/86	<0.1	<0.1	<0.1	15.0	- -
MW-15A	8010/8020		02/25/89	<0.5	<1.0	<2.0	<0.5	- -
MW-15A	5030/8010		03/09/89	200000	<5000	<100000	- -	300
MW-15A	5030/8020		03/09/89	- -	- -	- -	<0.5	- -
MW-16A	601\602		04/29/86	<0.1	<0.1	<0.1	<0.1	- -
MW-16A	8010/8020		02/25/89	<0.5	<1.0	<2.0	<0.5	73
MW-16B	601\602		04/29/86	<0.1	<0.1	<0.1	<0.1	- -
MW-16B	8010/8020		02/25/89	<0.5	<1.0	<2.0	<0.5	<1
MW-17A	601\602		04/28/86	<0.1	<0.1	<0.1	0.3	- -
MW-17A	8010/8020		02/25/89	<0.5	<1.0	<2.0	<0.5	24
MW-17A	8010/8020		02/24/89	<1.0	<2.0	<4.0	<1.0	1.1
MW-17B	601\602		04/28/86	<0.1	<0.1	<0.1	0.5	- -
MW-17B	8010/8020		02/25/89	<0.5	<1.0	<2.0	<0.5	<1
MW-17B	8010/8020		02/24/89	<1.0	<2.0	<4.0	<0.5	- -
KMW-03B	8010/8020		03/02/89	<0.5	<1.0	<2.0	<0.5	- -
KMW-04A	8010/8020		03/02/89	<0.5	<1.0	<2.0	<0.5	- -

Table 4-4 (cont)
Southern Pacific Transportation Company (Bayshore Yard)
Ground Water Organics Analyses
Report Form # 4

Sample Number	Test Method	QAQC Identification	Date Sampled	Trichloroethylene ug/l	Trichlorofluoromethane ug/l	Vinyl Chloride ug/l	Total Xylene ug/l	Total Petroleum Hydrocarbons mg/l
KMW-05A	5030/8010		03/09/89	180000	<1.0	<2.0	- -	- -
KMW-06B	5030/8010		03/09/89	<0.5	<1.0	<2.0	- -	- -
KMW-06B	5030/8020		03/09/89	- -	- -	- -	<0.5	- -
KMW-07A	8010/8020		03/02/89	<0.5	<1.0	<2.0	<0.5	- -
DW-224	8010/8020	DITCH N20-2791	02/26/89	<0.5	<1.0	<2.0	<0.5	2.6
DW-303	8010/8020	DITCH N20-0679	03/03/89	<0.5	<1.0	<2.0	<0.5	- -
DW-SS-1AF			/ /	- -	- -	- -	- -	- -
DW-SS-2AF			/ /	- -	- -	- -	- -	- -
BR 305	8010/8020	BRNSE-3/5-1119	03/07/89	<0.5	<1.0	<2.0	<0.5	- -
DCNWT	8010/8020	DECON WATER2-16	02/18/89	<1.0	<2.0	<4.0	<1.0	<1
N-SUMP	601\602		04/22/86	<0.1	<0.1	<0.1	<0.1	- -
S-SUMP	601\602	S-SUMP	04/29/86	<0.1	<0.1	<0.1	<0.1	- -
TB-2009	601\602	TB-2009	04/22/86	<0.1	<0.1	<0.1	3.8	- -
TB-217	5030/8010	TB-217	02/17/89	<0.5	<1.0	<2.0	- -	- -
TB-218	5030/8010	TB-218	02/18/89	<1.0	<2.0	<4.0	- -	- -
TB-223	8010/8020	TB-223	02/23/89	<0.5	<1.0	<2.0	<0.5	- -
TB-224	8010/8020	TB-224	02/24/89	<1.0	<2.0	<4.0	<1.0	- -
TB-225	8010/8020	TB-225	02/25/89	<0.5	<1.0	<2.0	<0.5	- -

Table 4-4 (cont)
Southern Pacific Transportation Company (Bayshore Yard)
Ground Water Organics Analyses
Report Form # 4

Sample Number	Test Method	QAQC Identification	Date Sampled	Trichloro-ethylene ug/l	Trichloro-fluoromethane ug/l	Vinyl Chloride ug/l	Total Xylene ug/l	Total Petroleum Hydrocarbons mg/l
TB-226	8010/8020	TB-226	02/26/89	<0.5	<1.0	<2.0	<0.5	- -
TB-302	8010/8020	TB-302	03/02/89	<0.5	<1.0	<2.0	<0.5	- -
TB-305	8010/8020	TB-305	03/05/89	<0.5	<1.0	2.0	<0.5	- -
TB-309	5030/8010	TB-309	03/09/89	<0.5	<1.0	22	<0.5	- -
TB-417	601\602	TB - M-417	04/17/86	<0.1	<0.1	<0.1	<0.1	- -
TB-423	601\602	TB-M-423	04/23/86	<0.1	<0.1	<0.1	<0.1	- -
TB-428	601\602	TB-M-428	04/28/86	<0.1	<0.1	<0.1	<0.1	- -
TB-429	601\602	TB-M-429	04/29/86	<0.1	<0.1	<0.1	<0.1	- -
TB-619	601\602	TB-M-619	06/19/86	<0.1	<0.1	<0.1	<0.1	- -
TB-630	601\602	TB-630	06/30/86	<0.1	<0.1	<0.1	<0.1	- -

D R A F T

Privileged and Confidential

Supplemental Remedial Investigation Data Study Report The Bayshore Railyard Brisbane, California

July 18, 1990
2034.16

Prepared for:

Tuntex Properties, Inc.
150 Executive Park Blvd.
Suite 4200
San Francisco, California 94134

LEVINE·FRICKE

TABLE 6
SOIL-GAS/GROUND-WATER SURVEY DATA
BRISBANE RAILYARD

		GROUND-WATER SAMPLES			SOIL-GAS SAMPLES		
Sample Location	Date of Sampling	Depth of Sample (feet)	Total VOCs (a) (ppb)	TPH (ppb)	Depth of Sample (feet)	Total VOCs (a) (ppb)	TPH (ppb)
SG1-1	05-Mar-90	9	0.11	<0.8	7	.32	<0.1
SG1-2	05-Mar-90	7	27	32	4	0.70	0.3
SG1-3	05-Mar-90	4	0.44	<0.8	3	--	<0.1
SG1-4	05-Mar-90	7	0.40	<0.8	3	--	<0.1
SG1-5	05-Mar-90	4	0.08	16	3	--	<0.1
SG1-6	05-Mar-90	5	0.42	<0.8	3	--	<0.1
SG1-7	05-Mar-90	5	4.6	<0.8	3	--	<0.1
SG1-8	05-Mar-90	3	0.22	<0.8	2	--	<0.1
SG1-9	05-Mar-90	5	0.41	<0.8	2	--	<0.1
SG1-10	05-Mar-90	2	0.61	<0.8	2	--	<0.1
SG1-11	06-Mar-90	3	9.8	4	2	0.90	<0.1
SG1-12	06-Mar-90	5	0.31	20	3	0.08	0.4
SG1-13	06-Mar-90	13	0.09	<0.8	6	0.01	<0.1
SG1-14	06-Mar-90	6	0.20	<0.8	4	--	<0.1
SG1-15	06-Mar-90	4	0.082	<0.8	2	0.4	<0.1
SG1-16	07-Mar-90	3	0.35	<3	2	0.002	2
SG1-17	07-Mar-90	3	0.16	<0.6	2	0.40	0.3
SG1-18	07-Mar-90	3	0.70	2	2	0.40	0.3
SG1-19	07-Mar-90	4	0.51	<0.6	2	0.002	<0.08
SG1-20	07-Mar-90	3	0.23	<0.6	2	0.40	0.2
SG1-21	07-Mar-90	3	1.0	<0.6	2	0.40	<0.08
SG1-22	07-Mar-90	4	9.0	22	3	0.81	0.8
SG1-23	07-Mar-90	4	0.22	<0.6	3	0.02	0.3
SG1-24	07-Mar-90	3	1.0	<0.6	2	0.002	<0.08
SG1-25	07-Mar-90	5	0.40	<0.6	3	0.0007	<0.08
SG1-26	07-Mar-90	4	200	160	3	9.3	3
SG1-34	07-Mar-90	8	1100	5400	6	211	140
SG1-35	09-Mar-90	5	0.46	1700	3	0.02	<0.08
SG1-36	09-Mar-90	5	0.31	<0.6	3	0.0006	<0.08
SG1-37	09-Mar-90	5	0.23	<0.6	3	0.0029	0.4(b)
SG1-38	09-Mar-90	5	0.31	<0.6	3	0.0003	<0.08
SG1-39	08-Mar-90	5	55	430	3	2.0	<0.8
SG1-40	08-Mar-90	6	140	430	4	8.4	2
SG1-41	08-Mar-90	5	0.24	20	3	--	<0.5
SG1-42	08-Mar-90	4	22	22	3	0.52	<0.2
SG1-43	08-Mar-90	10	8.3	10	6	2.0	2
SG1-44	08-Mar-90	9	0.42	<0.6	6	--	<0.08

TABLE 6
SOIL-GAS/GROUND-WATER SURVEY DATA
BRISBANE RAILYARD

		GROUND-WATER SAMPLES			SOIL-GAS SAMPLES		
Sample Location	Date of Sampling	Depth of Sample (feet)	Total VOCs (a) (ppb)	TPH (ppb)	Depth of Sample (feet)	Total VOCs (a) (ppb)	TPH (ppb)
SG1-45	08-Mar-90	5	2900	2600	3	25	9
SG1-46	09-Mar-90	6	0.42	<0.6	3	--	<0.08
SG1-47	09-Mar-90	5	0.21	<0.6	3	0.002	<0.08
SG1-48	09-Mar-90	5	2500	7200	3	73	32
SG1-49	09-Mar-90	5	0.45	<0.6	3	0.51	<0.08
SG1-50	09-Mar-90	5	300	340	3	6.3	2
SG1-51	12-Mar-90	8	4800	10000	6	1400	920
SG1-52	13-Mar-90	5	33	6	4	8.5	1
SG1-54	14-Mar-90	9	230	210	6	54	28
SG1-55	14-Mar-90	5	550	1000	3	45.0	16
SG1-56	14-Mar-90	5	800	1400	3	78	73
SG1-57	14-Mar-90	6	240	88	5	47	9
SG1-58	14-Mar-90	8	25	16	3	170	150
SG1-59	14-Mar-90	5	1.1	<0.08	3	0.03	<0.07
SG1-60	14-Mar-90	5	73	210	NS		
SG1-61	14-Mar-90	5	0.23	6	NS		
SG2-1	12-Mar-90	4	0.66	<0.6	NS		
SG2-2	12-Mar-90	4	48	34	3	5.8	0.4
SG2-3	13-Mar-90	4	53	52	3	3.4	0.3
SG2-4	12-Mar-90	4	0.03	<3	NS		
SG2-5	12-Mar-90	4	0.03	530	NS		
SG2-6	14-Mar-90	5	0.24	450	NS		
SG2-7	13-Mar-90	5	0.02	1300	NS		
SG2-8	12-Mar-90	4	0.12	<0.6	NS		
SG2-9	12-Mar-90	4	0.66	<0.6	NS		
SG2-10	12-Mar-90	4	0.04	3100	NS		
SG2-11	12-Mar-90	4	0.03	1900	NS		
SG2-12	12-Mar-90	4	0.03	820	NS		
SG2-13	09-Mar-90	3	0.01	620	NS		
SG2-14	12-Mar-90	5	0.10	270	NS		
SG2-15	13-Mar-90	2	0.02	<0.6	NS		
SG2-16	13-Mar-90	2	0.21	14	2	.0024	1.0
SG2-17	13-Mar-90	5	0.11	76	NS		
SG2-18	13-Mar-90	5	0.61	<0.6	NS		
SG2-19	13-Mar-90	5	0.06	<0.6	3	0.009	0.2
SG2-20	13-Mar-90	5	0.03	780	3	0.12	<0.07
SG2-21	13-Mar-90	5	0.21	6	NS		

TABLE 6
SOIL-GAS/GROUND-WATER SURVEY DATA
BRISBANE RAILYARD

		GROUND-WATER SAMPLES			SOIL-GAS SAMPLES		
Sample Location	Date of Sampling	Depth of Sample (feet)	Total VOCs (a) (ppb)	TPH (ppb)	Depth of Sample (feet)	Total VOCs (a) (ppb)	TPH (ppb)
SG2-22	14-Mar-90	5	0.22	<0.08	2	0.006	0.1
SG2-23	14-Mar-90	5	0.21	1100	NS		
SG2-24	14-Mar-90	9	6.1	<0.8	3	0.11	<0.07
SG2-25	14-Mar-90	5	0.27	<0.8	NS		

NOTES:

a) = Total VOCs is the sum of 1,1-DCE, 1,1-DCA, 1,1,1-TCA, trans-1,2-DCE, TCE, PCE, benzene, toluene, ethylbenzene and xylenes. For individual detection limits, please refer to the data sheets.

b) = Concentrations in blank exceeded or equaled sample concentration.

NS = Not Sampled. Soil gas sample was not collected at this location because water table was too high and/or shallow soils were saturated due to rainfall infiltration.

TABLE 7
SOIL-QUALITY DATA SUMMARY
VOLATILE ORGANIC COMPOUNDS
BRISBANE RAILYARD
(All results in parts per million)

Sample ID	Sample Depth (feet)	Date of Sample	Vinyl Chloride	Chloro-ethane	1,1-DCA	1,1-DCE	Total 1,2-DCE cis/trans	Chloro-form	Freon 113	1,2-DCA	1,1,1-TCA	1,2-DCP	TCE	1,1,2-TCA	PCE	Benzene	Toluene	Ethyl-benzene	Total Xylenes	Total Non-priority Pollutants
North Area																				
NSB-1-2A	2	04/11/90	<0.004	<0.004	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	0.007	<0.003	<0.004	<0.002	<0.002	<0.003	<0.003	ND
NSB-1-10A	10	04/11/90	0.007	<0.004	<0.003	<0.003	0.050	<0.003	<0.003	<0.003	<0.003	<0.003	0.025	<0.003	0.015	<0.002	<0.002	<0.003	<0.003	ND
NSB-2-5A	5	04/10/90	<0.004	<0.004	<0.003	<0.003	0.150	<0.003	<0.003	<0.003	<0.003	<0.003	0.067	<0.003	<0.004	<0.002	<0.002	<0.003	<0.003	ND
NSB-2-10A	10	04/10/90	<0.004	<0.004	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	0.240	<0.003	0.012	<0.002	<0.002	<0.003	<0.003	ND
NSB-2-15A	15	04/10/90	<0.004	<0.004	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	0.220	<0.003	<0.004	<0.002	<0.002	<0.003	<0.003	ND
NSB-3-2A	2	04/10/90	<0.004	<0.004	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	0.006	<0.003	0.007	<0.003	0.006	<0.002	0.005	<0.003	<0.003	ND
NSB-3-10A	10	04/10/90	<8	<10	<8	<5	<3	<4	<5	<4	<3	<3	<2	<3	<1	<3	<1	5	12	282
NSB-3-15A	15	04/10/90	18	<10	<8	<5	50	<4	<5	<3	<3	<3	3	<3	<1	<3	5	8	30	647
NSB-3-18A	18	04/10/90	<0.8	<1	<0.8	<0.5	<0.3	<0.4	<0.5	<0.4	<0.3	<0.3	1.8	<0.3	0.2	<0.3	<0.1	<0.2	<0.3	ND
NSB-4-6A	6	04/10/90	<4	<5	<4	<3	<2	<2	<3	<2	<2	<2	<1	<2	<0.5	<2	<0.5	<1	<2	314
NSB-4-9.5A	9.5	04/10/90	<0.004	<0.004	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.004	<0.003	<0.004	<0.002	<0.002	<0.003	<0.003	ND
NSB-5-2A	2	04/11/90	<0.004	<0.004	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.004	<0.003	<0.004	<0.002	<0.002	<0.003	<0.003	ND
NSB-5-10A	10	04/11/90	<0.004	<0.004	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	0.012	<0.003	<0.004	<0.002	<0.002	<0.003	<0.003	ND
NSB-6-2A	2	04/10/90	<0.004	<0.004	<0.003	<0.003	0.007	<0.003	<0.003	<0.003	<0.003	<0.003	0.056	<0.003	<0.004	<0.002	0.003	<0.003	<0.003	ND
NSB-6-11.5A	11.5	04/10/90	<0.004	<0.004	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	0.007	<0.003	<0.004	<0.002	<0.002	<0.003	<0.003	ND
NSB-6-15A	15	04/10/90	0.013	<0.004	<0.003	<0.003	0.120	<0.003	<0.003	<0.003	<0.003	<0.003	0.022	<0.003	<0.004	<0.002	<0.002	<0.003	<0.003	ND
LF-1A-5.5A	5.5	04/23/90	<0.2	<1	<0.2	<0.2	3.0	<0.2	<0.2	<0.4	<0.2	<0.3	21	<0.3	0.4	<0.2	<0.2	<0.2	<0.3	ND
LF-1A-11A	11	04/23/90	<0.2	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.4	<0.2	<0.3	<0.2	<0.3	<0.1	<0.2	<0.2	<0.2	<0.3	ND
LF-2B-41.5	41.5	04/26/90	<0.2	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.4	<0.2	<0.3	<0.2	<0.3	<0.1	<0.2	<0.2	<0.2	<0.3	ND
LF-3A-6A	6	04/23/90	<0.2	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.4	<0.2	<0.3	<0.2	<0.3	<0.1	<0.2	<0.2	<0.2	<0.3	ND
LF-3A-10.5A	10.5	04/23/90	<0.2	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.4	<0.2	<0.3	<0.2	<0.3	<0.1	<0.2	<0.2	<0.2	<0.3	ND
LF-3A-16.5A	16.5	04/23/90	<0.2	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.4	<0.2	<0.3	<0.2	<0.3	<0.1	<0.2	<0.2	<0.2	<0.3	ND
MP-1-10.5A	10.5	04/24/90	<0.2	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.4	<0.2	<0.3	<0.2	<0.3	<0.1	<0.2	<0.2	<0.2	<0.3	ND
LFP-1-5.0	5	04/25/90	<0.2	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.4	<0.2	<0.3	<0.2	<0.3	<0.1	<0.2	<0.2	<0.2	<0.3	ND

TABLE 7
SOIL-QUALITY DATA SUMMARY
VOLATILE ORGANIC COMPOUNDS
BRISBANE RAILYARD
(All results in parts per million)

Sample ID	Sample Depth (feet)	Date of Sample	Vinyl Chloride	Chloro-ethane	1,1-DCA	1,1-DCE	Total 1,2-DCE cis/trans	Chloro-form	Freon 113	1,2-DCA	1,1,1-TCA	1,2-DCP	TCE	1,1,2-TCA	PCE	Benzene	Toluene	Ethyl-benzene	Total Xylenes	Total Non-priority Pollutants
Off-Site Area																				
OSB-1-6	6	04/24/90	<0.2	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.4	<0.2	<0.3	1.9	<0.3	0.7	<0.2	<0.2	<0.2	<0.3	ND
OSB-1-11.5	11.5	04/24/90	<0.2	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.4	<0.2	<0.3	<0.2	<0.3	<0.1	<0.2	<0.2	<0.2	<0.3	ND
OSB-1-16A	16	04/24/90	<0.2	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.4	<0.2	<0.3	<0.2	<0.3	<0.1	<0.2	<0.2	<0.2	<0.3	ND
KPSB-3-3.5	3.5	05/11/90	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.005	<0.005	<0.005	<0.005	NA

NA = Not analyzed
ND = Not detected at or above limit of detection

TABLE 8
SOIL-QUALITY DATA SUMMARY
SEMI-VOLATILE ORGANIC COMPOUNDS
BRISBANE RAILYARD
(All results in parts per million)

Sample ID	Sample Depth (feet)	Date of Sample	Foot-note	Acena-phthene	Fluorene	Phenan-threne	Anthra-cene	Fluoran-thene	Pyrene	Benzo(a)-anthra-cene	Bis-(2-ethylhexyl) phthalate	Chrysene	Tentatively identified Semi-Quantified Compounds	Naph-thalene	2-methyl Naph-thalene
North Area															
SG1-4-0	0	04/19/90		<0.06	<0.06	0.070	<0.06	0.140	0.170	<0.06	1.1	<0.1	0.228	<0.06	<0.06
SG1-11-0	0	04/19/90		<1	<1	<1	<1	<1	<1	<1	<10	<2	0	<1	<1
SG1-15-0	0	04/19/90		<1	<1	2	<1	3	3	<1	30	<2	0	<1	<1
SG1-48-0	0	04/19/90		<0.1	<0.1	0.27	<0.1	0.36	0.48	<0.1	<1	<0.3	5.87	<1	<1
NSB-1-10A	10	04/11/90		<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.6	<0.1	0.352	<0.06	<0.06
NSB-3-10A	10	04/10/90		84	110	320	590	69	71	24	57	35	945	130	140
Turntable/Oil Tank Area															
TTSB-1-7A	7	04/12/90		<1	<1	<1	<1	<1	<1	<1	<10	<2	93	<1	<1
TTSB-3-15A	15	04/12/90		<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	2.000	<0.1	0.479	<0.06	<0.06
TTSB-5-2A	2	04/11/90		<1	<1	2	4	<1	<1	<1	<10	<2	0	<1	<1
TTSB-5-10A	10	04/11/90		<0.05	<0.06	<0.08	<0.06	<0.06	<0.06	<0.06	1.400	<0.1	4.740	<0.06	0.090
TTSB-7-7A	7	04/12/90		<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	2.300	<0.1	4.126	<0.06	<0.06
TTSB-9-9.5A	9.5	04/18/90		<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.6	<0.1	2.047	<0.06	<0.06
TTSB-10-8A	8	04/18/90		<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.6	<0.1	7.650	<0.06	<0.06
SG2-6-0	0	04/19/90		<1	<1	<1	<1	<1	<1	<1	<10	<2	0	<1	<1
OTT-1-0	0	04/19/90		<1	<1	<1	<1	<1	<1	<1	50	<2	0	<1	<1
OTT-20-0	0	04/19/90		<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	0.9	<0.1	0.091	<0.06	<0.06
OTSB-3-5A	5	04/16/90		<0.06	<0.06	<0.06	<0.06	0.220	0.250	<0.06	<0.6	<0.1	0.320	<0.06	<0.06
OTSB-3-9.5B	9	04/16/90		<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	1	<0.1	8.3	<0.06	<0.06
OTSB-6-6.5A	6.5	04/13/90		<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	3.600	<0.1	0.320	<0.06	<0.06
OTSB-10-6A	6	04/16/90		<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.6	<0.1	0	<0.06	<0.06

TABLE 8
SOIL-QUALITY DATA SUMMARY
SEMI-VOLATILE ORGANIC COMPOUNDS
BRISBANE RAILYARD
(All results in parts per million)

Sample ID	Sample Depth (feet)	Date of Sample	Foot-note	Acena-phthene	Fluorene	Phenan-threne	Anthra-cene	Fluoran-thene	Pyrene	Benzo(a)-anthra-cene	Bis-(2-ethylhexyl) phthalate	Chrysene	Tentatively Identified Semi-Quantified Compounds	Naph-thalene	2-methyl Naph-thalene
South Disposal Area															
SDT-8-0	0	04/19/90		<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	1.3	<0.1	0.076	<0.06	<0.06
Offsite															
KPSB-1-2.5	2.5	05/11/90		<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	0.400	<0.1	0	<0.06	<0.06
KPSB-5-1	1	05/11/90		<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	3.000	<0.1	0.630	<0.06	<0.06

Key:

SG1 - Soil Gas Point, North Area
NSB - North Area Soil Boring
TTSB - Turntable Area Soil Boring
SG2 - Soil Gas Point, Turntable Area
OTT - Oil Tank Area Trench
OTSB - Oil Tank Area Soil Boring
SDT - South Disposal Area Trench
KPSB - Kessler Property Soil Boring

SDP < South Disposal Area Piezometer
OSB < Offsite Soil Boring
LF < Levine<Fricke Monitoring Well
LFP < Levine<Fricke Piezometer
MW < Monitoring Well
NP < North Area Piezometer
OTP < Oil Tank Area Piezometer

TABLE 9
SOIL-QUALITY DATA SUMMARY
TITLE 22 METALS
BRISBANE RAILYARD

Sample ID	Sample Depth	mg/kg or mg/l extract	Date of Sample	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium + 6	Chromium Total	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
STLC		mg/l		15	5.0	100	0.75	1.0	5	560	80	25	5.0	0.2	350	20	1.0	5	7.0	24	250
TTLC		mg/kg		500	500	10,000	75	100	500	2,500	8,000	2,500	1,000	20	3,500	2,000	100	500	700	2,400	5,000
Mean Regional Background (a)		mg/kg		<1	10	1,000	<1	---	---	100	15	50	30	0.2	<3	30	<0.1	---	9.1	150	120
North Area																					
SG1-1-0	0	mg/kg	04/19/90	5	13	86	<0.1	1.7	NA	40	7	330	320	<0.1	2	36	<5	<0.5	<1	19	330
SG1-4-0	0	mg/kg	04/19/90	<1	7	50	<0.1	0.7	<0.1	13	8	110	110	0.1	<1	8	<5	<0.5	<1	49	140
SG1-11-0	0	mg/kg	04/19/90	16	8	85	<0.1	1.7	NA	44	10	220	790	0.1	<1	25	<5	<0.5	<1	41	350
SG1-15-0	0	mg/kg	04/19/90	4	11	83	<0.1	1.4	<0.1	30	9	140	320	0.1	1	25	<5	<0.5	<1	33	430
SG1-16-0	0	mg/kg	04/19/90	11	<5	120	<0.1	2.7	<0.1	50	9	140	550	<0.1	8	43	<5	<0.5	<1	34	560
SG1-39-0	0	mg/kg	04/19/90	16	9	130	<0.1	2.5	NA	42	15	430	450	0.2	2	37	<5	<0.5	<1	31	570
SG1-48-0	0	mg/kg	04/19/90	8	6	87	<0.1	2.7	<0.1	35	9	190	370	0.2	6	27	<5	<0.5	<1	33	630
NSB-1-2A	2	mg/kg	04/11/90	<1	15	82	<0.1	<0.1	NA	31	11	57	9	0.4	<1	78	0.4	<0.5	<1	41	36
NSB-1-2A	2	mg/L	04/11/90	<0.1	0.46	3	<0.05	<0.05	NA	<0.1	0.2	0.4	<0.1	<0.01	<0.1	1	<0.005	<0.1	<0.1	<0.1	0.2
NSB-5-2A	2	mg/kg	04/11/90	<1	1	34	<0.1	<0.1	NA	11	8	86	49	<0.1	<1	16	0.3	<0.5	<1	34	42
NSB-5-2A	2	mg/L	04/11/90	<0.2	0.03	0.9	<0.05	<0.05	NA	<0.1	0.1	1.4	1.8	<0.01	<0.1	0.1	<0.005	<0.1	<0.1	0.1	1
NSB-6-2A	2	mg/kg	04/10/90	<10	<0.3	65	<1	<1	NA	<10	<10	11	<10	<0.1	<10	<10	<0.5	<10	<10	<10	44
NSB-6-2A	2	mg/L	04/10/90	<0.1	<0.01	1	<0.05	<0.05	NA	<0.1	<0.1	<0.1	<0.1	<0.01	<0.1	0.1	<0.005	<0.1	<0.1	<0.1	0.4
Turntable/Oil Tank Area																					
TTSB-3-15A	15	mg/kg	04/12/90	<1	4.5	12	0.2	0.3	NA	27	6	16	27	<0.1	<1	31	<0.1	<0.5	<1	22	37
TTSB-4-5A	5	mg/kg	04/18/90	1	<5	48	0.7	0.4	NA	36	17	71	20	<0.1	<1	40	<5	<0.5	<2	43	140
TTSB-4-5A	5	mg/L	04/18/90	<0.1	<0.03	4.1	<0.05	<0.05	NA	<0.1	0.3	<0.1	<0.1	<0.01	0.1	0.3	<0.03	<0.1	<0.1	1.0	1.0
TTSB-5-2A	2	mg/kg	04/11/90	83	8.1	58	<0.1	0.6	NA	18	8	430	820	0.2	<1	55	<0.1	<0.5	<1	55	460
TTSB-5-2A	2	mg/L	04/11/90	0.8	0.01	3.2	<0.05	0.09	NA	0.3	<0.1	11	30	<0.01	<0.1	1.3	<0.005	<0.1	<0.1	0.5	16

TABLE 9
SOIL-QUALITY DATA SUMMARY
TITLE 22 METALS
BRISBANE RAILYARD

Sample ID	Sample Depth	mg/kg or mg/l extract	Date of Sample	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium + 6	Total Chromium	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
STLC		mg/l		15	5.0	100	0.75	1.0	5	560	80	25	5.0	0.2	350	20	1.0	5	7.0	24	250
TTLC		mg/kg		500	500	10,000	75	100	500	2,500	8,000	2,500	1,000	20	3,500	2,000	100	500	700	2,400	5,000
Mean Regional Background (a)		mg/kg		<1	10	1,000	<1	---	---	100	15	50	30	0.2	<3	30	<0.1	---	9.1	150	120
TTSB-5-10A	10	mg/kg	04/11/90	<1	2	24	0.1	<0.1	NA	20	8	34	48	<0.1	<1	26	0.3	<0.5	<1	36	61
TTSB-5-10A	10	mg/L	04/11/90	<0.1	0.16	0.6	<0.05	<0.05	NA	0.2	0.2	0.2	0.1	<0.01	<0.1	0.8	<0.005	<0.1	<0.1	0.6	0.4
TTSB-6-6.5A	6.5	mg/kg	04/12/90	<1	2.4	20	0.3	<0.1	NA	13	7	22	17	<0.1	<1	14	<0.1	<0.5	<1	19	56
TTSB-7-7A	7	mg/kg	04/12/90	<1	19	31	0.3	0.2	NA	23	9	51	27	0.1	<1	30	0.5	<0.5	<1	23	42
TTSB-7-16.5A	16.5	mg/kg	04/12/90	<1	3.1	9	0.2	0.3	NA	24	6	15	5	<0.1	<1	28	0.3	<0.5	<1	20	32
OTP-1-0	0	mg/kg	04/19/90	5	<5	61	<0.1	1.5	NA	38	8	140	130	0.1	6	25	<5	<0.5	<1	30	300
SG2-6-0	0	mg/kg	04/19/90	2	<5	37	<0.1	0.4	NA	16	9	110	110	<0.1	<1	19	<5	<0.5	<1	66	71
OTT-1-0	0	mg/kg	04/19/90	2	<5	53	<0.1	0.7	<0.1	21	8	220	320	0.1	2	130	<5	<0.5	<1	150	110
OTT-20-0	0	mg/kg	04/19/90	<1	<5	47	<0.1	0.1	NA	4	7	73	13	<0.1	<1	2	<5	<0.5	<1	64	30
OTSB-1-8.5A	8.5	mg/kg	04/13/90	<1	5	16	0.2	0.2	NA	30	9	28	27	<0.1	<1	36	<0.1	<0.5	<1	28	62
OTSB-1-8.5A	8.5	mg/L	04/13/90	<0.1	0.06	0.3	<0.05	<0.05	NA	0.2	<0.1	0.7	0.3	<0.01	<0.1	0.3	<0.005	<0.1	<0.1	0.5	0.6
OTSB-3-5A	5	mg/kg	04/16/90	<1	13	36	0.7	<0.1	NA	28	12	23	10	<0.1	<1	26	<3	<0.5	<1	37	48
OTSB-3-5A	5	mg/L	04/16/90	<0.1	0.19	1.7	<0.05	<0.05	NA	0.2	0.1	0.4	0.7	<0.01	<0.1	0.1	<0.005	<0.1	<0.1	0.3	0.6
OTSB-3-9.5B	9.5	mg/kg	04/16/90	<1	4.3	46	0.3	0.5	NA	36	8	46	270	<0.1	<1	36	<1	<0.5	<1	29	160
OTSB-3-9.5B	9.5	mg/L	04/16/90	<0.1	0.1	0.6	<0.05	<0.05	NA	0.2	0.4	0.2	2	<0.01	<0.1	0.9	<0.005	<0.1	<0.1	0.5	2.6
South Disposal Area																					
MW-10A-0	0	mg/kg	04/19/90	8	7	82	<0.1	1.6	<0.1	53	9	180	260	<0.1	6	43	<5	<0.5	<1	19	350
SDT-1-0	0	mg/kg	04/19/90	27	18	480	0.1	3.6	NA	100	13	910	2500	0.9	<1	49	<5	3.1	<3	34	1700
SDT-8-0	0	mg/kg	04/19/90	<1	<5	81	0.2	0.3	NA	30	10	25	52	<0.1	<1	23	<5	<0.5	<1	38	89
SDP-2-6	6	mg/kg	04/25/90	72	6	770	0.2	2.1	NA	20	9	570	3,800	0.9	<1	35	<1	4.1	3	20	1,400
SDP-2-10	10	mg/kg	04/25/90	<1	6	14	0.2	0.2	NA	38	9	18	4	<0.1	<1	42	<1	<0.5	<1	31	42
SDP-2-10	10	mg/l	04/25/90	<0.1	<0.2	0.2	<0.05	<0.05	NA	0.2	0.2	<0.1	0.2	<0.01	<0.1	0.8	<0.2	<0.1	<0.1	0.4	0.4

TABLE 9
SOIL-QUALITY DATA SUMMARY
TITLE 22 METALS
BRISBANE RAILYARD

Sample ID	Sample Depth	mg/kg or mg/l extract	Date of Sample	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium + 6	Total Chromium	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
STLC		mg/l		15	5.0	100	0.75	1.0	5	560	80	25	5.0	0.2	350	20	1.0	5	7.0	24	250
TTLC		mg/kg		500	500	10,000	75	100	500	2,500	8,000	2,500	1,000	20	3,500	2,000	100	500	700	2,400	5,000
Mean Regional Background (a)		mg/kg		<1	10	1,000	<1	---	---	100	15	50	30	0.2	<3	30	<0.1	---	9.1	150	120
SDP-3-5.5	5.5	mg/kg	04/25/90	14	8	520	0.1	1.4	NA	15	11	1,400	1,500	0.5	<1	21	<1	2.0	9	21	1,200
SDP-3-10.5	10.5	mg/kg	04/25/90	<1	5	16	0.3	0.2	NA	43	10	22	3	<0.1	<1	47	<1	<0.5	<1	37	47
SDP-3-10.5	10.5	mg/l	04/25/90	<0.1	<0.2	0.9	<0.05	<0.05	NA	0.2	0.2	0.4	2.4	<0.01	<0.1	0.4	<0.2	<0.1	<0.1	0.5	1.9
SDP-5-6	6	mg/kg	04/25/90	35	10	500	0.5	3.2	NA	38	11	900	4,600	4.1	<1	46	<5	4.2	3	26	2,300
SDP-5-11.5	11.5	mg/kg	04/25/90	<1	2	17	0.3	<0.1	NA	38	5	14	3	<0.1	<1	33	<1	<0.5	<1	33	40
SDSB-1-4.5A	4.5	mg/kg	04/17/90	36	3.1	480	<0.1	5.5	NA	27	16	3300	2700	0.5	<1	54	<10	2.4	<10	19	5700
SDSB-1-10A	10	mg/kg	04/17/90	<3	4.5	16	0.3	0.2	NA	43	8	20	5	<0.1	<1	42	<10	<0.5	<1	34	43
SDSB-2-8A	8	mg/kg	04/18/90	27	12	550	0.2	4.6	NA	52	14	3,500	3,700	<0.1	<1	4	<5	4.0	6	26	2,700
SDSB-2-8A	8	mg/L	04/18/90	0.5	0.06	4.4	<0.05	0.11	NA	0.1	0.1	45	120	<0.01	0	0.5	<0.03	<0.1	<0.1	<0.1	75
SDSB-2-14.5A	14.5	mg/kg	04/18/90	<1	<5	21	0.3	0.2	NA	55	11	27	5	<0.1	<1	56	<5	<0.5	<1	45	56
SDSB-2-14.5A	14.5	mg/L	04/18/90	<0.1	<0.03	0.2	<0.05	<0.05	NA	0.2	0.2	0.1	0.4	<0.01	<0.1	0.4	<0.03	<0.1	<0.1	0.5	0.5
SDSB-3-3.5A	3.5	mg/kg	04/16/90	13	13	420	<0.1	3	NA	31	11	3400	1700	7.4	<1	34	<10	2.5	<2	13	3500
SDSB-3-3.5A	3.5	mg/L	04/16/90	0.2	0.07	6.4	<0.05	0.14	NA	0.4	0.2	44	110	<0.01	<0.1	0.7	<0.005	<0.1	<0.1	<0.1	130
SDSB-3-10B	10	mg/kg	04/16/90	<1	3.8	64	0.5	<0.1	NA	22	12	48	8	<0.1	<1	24	<5	<0.5	<1	36	47
SDSB-3-10B	10	mg/L	04/16/90	<0.1	<0.01	4.1	<0.05	<0.05	NA	<0.1	0.4	0.2	0.3	<0.01	<0.1	0.1	<0.005	<0.1	<0.1	0.1	0.4
SDSB-4-4A	4	mg/kg	04/17/90	31	11	550	<0.1	6.2	NA	54	10	580	6400	0.3	<10	40	<10	<5	<10	20	2400
SDSB-4-4A	4	mg/L	04/17/90	0.3	0.13	5.4	<0.05	0.08	NA	0.1	<0.1	5.7	350	<0.01	<0.1	0.2	0.096	<0.1	<0.1	<0.1	31
SDSB-4-11A	11	mg/kg	04/17/90	<1	4.8	20	0.3	0.3	NA	48	10	23	7	<0.1	<1	48	<3	<0.5	<1	39	50
SDSB-4-11A	11	mg/L	04/17/90	<0.1	0.06	0.2	<0.05	<0.05	NA	0.2	0.2	0.1	0.1	<0.01	<0.1	0.4	<0.005	<0.1	<0.1	0.5	0.4
SDSB-5-4.5A	4.5	mg/kg	04/17/90	13	15	420	<0.1	2.4	NA	51	16	1500	2000	<0.1	<1	57	<6	6.6	<1	20	1500
SDSB-5-13A	13	mg/kg	04/17/90	<1	3.9	13	<0.1	<0.1	NA	22	6	12	7	<0.1	<1	19	<3	<0.5	<1	23	34
SDSB-6-4A	4	mg/kg	04/18/90	63	10	290	<0.1	7.1	NA	44	12	2,800	6,700	1.0	1	61	<5	5.3	8	24	4,800
SDSB-6-4A	4	mg/L	04/18/90	1.5	0.13	4.3	<0.05	0.35	NA	0.4	0.2	150	170	<0.01	<0.1	0.9	<0.03	<0.1	<0.1	<0.1	210
SDSB-6-16A	16	mg/kg	04/18/90	<1	<5	19	0.2	0.1	NA	29	6.1	16	8	0.1	<1	26	<5	<0.5	<1	26	37

TABLE 9
SOIL-QUALITY DATA SUMMARY
TITLE 22 METALS
BRISBANE RAILYARD

Sample ID	Sample Depth	mg/kg or mg/l extract	Date of Sample	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium + 6	Total Chromium	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
STLC		mg/l		15	5.0	100	0.75	1.0	5	560	80	25	5.0	0.2	350	20	1.0	5	7.0	24	250
TTLC		mg/kg		500	500	10,000	75	100	500	2,500	8,000	2,500	1,000	20	3,500	2,000	100	500	700	2,400	5,000
Mean Regional Background (a)		mg/kg		<1	10	1,000	<1	---	---	100	15	50	30	0.2	<3	30	<0.1	---	9.1	150	120
SDSB-6-16A	16	mg/L	04/18/90	<0.1	0.05	0.7	<0.05	<0.05	NA	0.2	0.1	0.2	0.8	<0.01	<0.1	0.3	<0.03	<0.1	<0.1	0.5	1.0
SDSB-7-5A	5	mg/kg	04/17/90	46	7.4	620	<0.1	2.4	NA	30	13	710	4700	0.6	<1	35	<10	2.8	<1	25	3200
SDSB-7-5A	5	mg/L	04/17/90	0.7	0.04	9.2	<0.05	0.09	NA	0.3	0.1	81	92	<0.01	<0.1	0.9	<0.005	<0.1	<0.1	0.1	90
SDSB-7-10A	10	mg/kg	04/17/90	<1	4.7	22	0.3	0.3	NA	47	10	30	28	<0.1	<1	46	<3	<0.5	<1	37	60
SDSB-7-10A	10	mg/L	04/17/90	<0.1	0.05	1.1	<0.05	<0.05	NA	0.1	<0.1	0.6	2.4	<0.01	<0.1	0.3	<0.005	<0.1	<0.1	0.3	2.2
SDSB-10-5A	5	mg/kg	04/19/90	33	11	370	0.2	4.7	NA	39	17	900	2,400	0.6	<1	37	<5	4.0	15	26	1,900
SDSB-10-10A	10	mg/kg	04/19/90	1	<5	29	0.3	0.4	NA	46	10	35	56	<0.1	<1	47	<5	<0.5	<1	37	79
LF-7A-11	11	mg/kg	04/24/90	<1	3	14	0.3	0.2	NA	37	8	21	3	<0.1	<1	40	<1	<0.5	<1	32	42
Offsite																					

Offsite-North	0	mg/kg	04/19/90	2	<5	84	<0.1	1	NA	41	6	68	190	0.2	2	29	<5	<0.5	<1	24	200
Offsite-South	0	mg/kg	04/19/90	<1	<5	20	<0.1	<0.1	NA	31	6	7	10	<0.1	<1	21	<5	<0.5	<1	32	35
OSB-1-6	6	mg/l	04/24/90	<0.1	<0.2	2.5	<0.05	<0.05	NA	0.3	0.2	0.2	<0.1	<0.01	<0.1	0.4	<0.2	<0.1	<0.1	0.4	0.7

NOTES:

NA = Not Analyzed
All samples analysed by EPA Method 200.
Sample concentrations reported as "mg/kg extract" are total metals concentrations.
Sample concentrations reported as "mg/l extract" were analysed using the Title 22 WET.
a = Mean Regional Background Concentrations from Shaklette (19XX).

TABLE 10

SOIL-QUALITY DATA SUMMARY
TOTAL PETROLEUM HYDROCARBONS
BRISBANE RAILYARD
(All results in mg/kg [ppm])

Sample ID	Foot-notes	Sample Depth	Date of Sample	Diesel Fuel	Waste Oil
North Area					
NSB-2-10A		10	04/10/90	<2	24
NSB-3-10A	a	10	04/10/90	16,000	21,000
NSB-3-15A	a	15	04/10/90	16,000	24,000
NSB-3-18A	a	18	04/10/90	110	250
NSB-3-2A	b	2	04/10/90	<800	7,900
NSB-4-6A		6	04/10/90	9,000	15,000
NSB-6-11.5A		11.5	04/10/90	<2	15
LF-1A-5.5A	a	5.5	04/23/90	2	20
LF-1A-11A		11	04/23/90	<2	17
LF-2B-41.5A		41.5	04/26/90	<2	11
LF-3A-6A	a,c	6	04/23/90	20	190
LF-3A-10.5A		10.5	04/23/90	<2	12
LF-3A-16.5A		16.5	04/23/90	<2	150
Turntable/Oil Tank Area					
TTSB-1-7A	a	7	04/12/90	300	3,300
TTSB-1-10A	a	10	04/12/90	5	110
TTSB-2-6A	a	6	04/11/90	<2	20
TTSB-2-15A		15	04/11/90	<2	20
TTSB-3-15A		15	04/12/90	<2	16
TTSB-4-5A		5	04/18/90	4,200	370
TTSB-4-12A		12	04/18/90	350	50
TTSB-5-2A	b,c	2	04/11/90	<80	300
TTSB-5-10A	a,c	10	04/11/90	140	580
TTSB-6-6.5A		6.5	04/12/90	<2	19
TTSB-6-15A		15	04/12/90	<2	17
TTSB-7-7A	a,c	7	04/12/90	600	3,200
TTSB-7-16.5A		16.5	04/12/90	<2	28
TTSB-9-9.5		9.5	04/18/90	<2	44
TTSB-9-14A		14	04/19/90	<2	53
TTSB-10-8A		8	04/18/90	220	<200
TTSB-10-12.5A	b	12.5	04/18/90	800	<2,000
TTSB-10-14A		14	04/18/90	10	<4
TTSB-11-7A	a	7	04/13/90	150	1,500
TTSB-11-10A		10	04/13/90	<2	36
OTP-2-5.5		5.5	04/25/90	<2	8
OTP-4-9.5	a	9.5	04/25/90	25	68
OTSB-1-8.5A		8.5	04/13/90	<2	24
OTSB-1-11A		11	04/13/90	<2	12

TABLE 10

SOIL-QUALITY DATA SUMMARY
TOTAL PETROLEUM HYDROCARBONS
BRISBANE RAILYARD
(All results in mg/kg [ppm])

Sample ID	Foot-notes	Sample Depth	Date of Sample	Diesel Fuel	Waste Oil
OTSB-5-9A	a	9	04/19/90	8,000	22,000
OTSB-5-12.5A		12.5	04/19/90	<2	8
OTSB-6-6.5A	b	6.5	04/13/90	<10	60
OTSB-6-11A		11	04/13/90	<2	8
OTSB-8-10A		10	04/16/90	<2	49
OTSB-10-6A		6	04/16/90	<2	170
OTSB-10-12A		12	04/16/90	<2	180
OTSB-11-7A		7	04/13/90	<2	11
OTSB-11-11A		11	04/13/90	<2	10
LF-4A-5.5A		5.5	04/23/90	100	60
LF-5A-9.5A		9.5	04/24/90	<2	11
LF-8A-5.5A	a	5.5	04/26/90	13,000	20,000
South Disposal Area					
SDSB-1-10A		10	04/17/90	<2	17
SDSB-5-4.5A		4.5	04/17/90	<2	60
SDSB-5-13A		13	04/17/90	<2	19
SDSB-10-7A	a	7	04/19/90	26	140
LF-7A-11		11	04/24/90	<2	38
Offsite					
KPSB-1-3.0		3	05/11/90	<2	4
KPSB-1-7.5	a	7.5	05/11/90	14	36
KPSB-3-3.5	b	3.5	05/11/90	<20	240
KPSB-5-1	b	1	05/11/90	<8	90
OSB-1-6		6	04/24/90	<2	53
OSB-1-11.5A	c	11.5	04/24/90	<2	19
OSB-1-16A		16	04/24/90	<2	5
OTSB-3-5A		5	04/16/90	61	50
OTSB-3-9.5B	a	9	04/16/90	36	160
OTSB-4-8.5A	a	8.5	04/20/90	17	74
OTSB-4-10A	a	10	04/20/90	4	7
OTSB-7-7A		7	04/20/90	<2	7
OTSB-9-8A	a	8	04/19/90	4	20
TTSB-8-1A	a	1	04/19/90	<80	500

All TPH analyses were conducted using modified EPA Method 8015.

NA - Not Analyzed

TABLE 10

SOIL-QUALITY DATA SUMMARY
TOTAL PETROLEUM HYDROCARBONS
BRISBANE RAILYARD
(All results in mg/kg [ppm])

Sample ID	Foot-notes	Sample Depth	Date of Sample	Diesel Fuel	Waste Oil

Footnotes:

a - Hydrocarbons present in diesel range may be part of waste oil present in sample.

b - Diesel detection limit increased due to matrix interference.

c - Soil samples LF-3A-6A, OSB-1-11.5A, TTSB-5-2A, TTSB-5-10A and TTSB-7-7A were also analyzed for total petroleum hydrocarbons (TPH) as gasoline. TPH as gasoline was not detected at or above the method detection limit in these samples.

TABLE 12
WATER-QUALITY DATA SUMMARY
VOLATILE ORGANIC COMPOUNDS
BRISBANE RAILYARD
(All results in parts per billion)

Sample ID	Date of Sample	Foot-note	Vinyl Chloride	Chloro-ethane	1,1-DCA	1,1-DCE	1,2-DCE cis/trans	Chloro-form	Freon 113	1,2-DCA	1,1,1-TCA	1,2-DCP	TCE	1,1,2-TCA	PCE	Benzene	Toluene	Ethyl-benzene	Total Xylenes
MCL			1	NE	NE	7	NE	100	NE	5	200	NE	5	NE	NE	5.0	NE	NE	1,750
DWAL			0.5	NE	5	6	6	100	1200	0.5	200	10	5	32	5	1.0	100	680	1,750
Surface Water																			
Ditch Middle	02/23/90		<1	<5	0.1 *	<0.5	<0.5	<0.5	<1	<1	<0.5	<1	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<1
Ditch North	02/26/90		<5	<25	<0.5	<2.5	<2.5	<2.5	<5	<5	<2.5	<5	<2.5	<5	<2.5	<2.5	<0.5	<0.5	<1
Ditch South	02/23/90		<1	<5	<0.5	<0.5	<0.5	<0.5	<1	<1	<0.5	<1	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<1
A-Zone Wells																			
KMW-4A	02/15/90		<1	<5	<0.5	<0.5	<0.5	<0.5	<1	<1	<0.5	<1	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<1
KMW-7A	02/28/90		<1	<5	<0.5	<0.5	<0.5	<0.5	<1	<1	<0.5	<1	<0.5	<1	<0.5	<0.5	<0.29 *	<0.5	<1
LF-1A	05/02/90		220	<4	<3	9	3,000	<3	<3	<3	<3	<3	1,000	<3	6	<2	<2	<3	<3
LF-1A	05/02/90	**	250	<5	<4	<2	2,100	<5	<6	<3	<5	<5	550	<6	5.4	NA	NA	NA	NA
LF-3A	05/03/90		<4	<4	<3	<3	6	<3	<3	<3	<3	<3	<4	<3	<4	<2	<2	<3	<3
LF-4A	05/04/90	***	<4	<4	<3	<3	<3	<3	<3	<3	<3	<3	<4	<3	<4	<2	<2	<3	<3
LF-5A	05/04/90		<4	<4	<3	<3	<3	<3	<3	<3	<3	<3	<4	<3	<4	<2	<2	<3	<3
LF-7A	05/02/90		<4	<4	<3	<3	<3	<3	<3	<3	<3	<3	<4	<3	<4	<2	<2	<3	<3
LF-7A	05/02/90	**	<0.5	<0.5	<0.4	<0.2	<0.4	<0.5	<0.6	<0.3	<0.5	<0.5	<0.3	<0.6	<0.5	NA	NA	NA	NA
LF-7A DUP	05/02/90	**	<1	<5	<0.5	<0.5	<0.5	<0.5	<1	<1	<0.5	<1	<0.5	<1	<0.5	NA	NA	NA	NA
LF-8A	05/02/90	**	<3	<3	<2	<1	<2	<3	<3	<2	<3	<3	<3	<3	<3	NA	NA	NA	NA
LF-8A	05/02/90		<4	<4	<3	<3	<3	<3	<3	<3	<3	<3	<4	<3	<4	<2	<2	<3	<3
LF-8A DUP	05/02/90	**	<1	<5	<0.5	<0.5	<0.5	<0.5	<1	<1	<0.5	<1	<0.5	<1	<0.5	NA	NA	NA	NA
LF-9A	04/30/90		9	<4	<3	88	62	<3	<3	<3	33	<3	52,000	14	10,000	<2	<2	<3	<3

TABLE 12
WATER-QUALITY DATA SUMMARY
VOLATILE ORGANIC COMPOUNDS
BRISBANE RAILYARD
(All results in parts per billion)

Sample ID	Date of Sample	Foot-note	Vinyl Chloride	Chloro-ethane	1,1-DCA	1,1-DCE	1,2-DCE cis/trans	Chloro-form	Freon 113	1,2-DCA	1,1,1-TCA	1,2-DCP	TCE	1,1,2-TCA	PCE	Benzene	Toluene	Ethyl-benzene	Total Xylenes
MCL			1	NE	NE	7	NE	100	NE	5	200	NE	5	NE	NE	5.0	NE	NE	1,750
DWAL			0.5	NE	5	6	6	100	1200	0.5	200	10	5	32	5	1.0	100	680	1,750
LF-9A	05/25/90	** f	<0.5	<0.5	<0.4	5.6	5.1	1.4	<0.6	0.7	1.0	<0.5	19,000	8.0	1,900	NA	NA	NA	NA
LF-10A	04/30/90		<4	<4	<3	5	<3	<3	<3	<3	<3	<3	1,900	<3	170	<2	<2	<3	<3
MK-1A	02/20/90		0.97 *	<5	<0.5	<0.5	<0.5	3.5	<1	<1	<0.5	<1	<0.5	<1	<0.5	<0.5	<0.22 *	<0.5	<1
MK-2A	02/22/90		<1	<5	<0.5	<0.5	<0.5	<0.5	<1	<1	<0.5	<1	<0.5	<1	<0.5	<0.5	<0.17 *	<0.5	0.21 *
MK-4A	02/15/90		<1	<5	<0.5	<0.5	<0.5	<0.5	<1	<1	<0.5	<1	<0.5	<1	<0.5	<0.5	<0.2 *	<0.5	<1
MK-5A	02/20/90		<1	<5	<0.5	<0.5	<0.5	<0.5	<1	<1	<0.5	<1	<0.5	<1	<0.5	<0.5	<0.4 *	<0.5	<0.1
MK-5A DUP	02/20/90		<1	<5	<0.5	<0.5	<0.5	<0.5	<1	<1	<0.5	<1	<0.5	<1	<0.5	<0.5	<0.4 *	<0.5	<0.1
MK-6A	02/22/90		<1	<5	<0.5	<0.5	0.67	<0.5	<1	<1	0.15	<1	<0.5	<1	<0.5	<0.5	<0.17 *	<0.5	<1
MK-7A	02/22/90		<1	<5	0.5	<0.5	<0.5	<0.5	<1	<1	<0.5	<1	<0.5	<1	<0.5	<0.5	<0.17 *	<0.5	<1
MK-8A	03/02/90		<1	<5	<0.5	<0.5	<0.5	<0.5	<1	<1	0.2 *	<1	0.1 *	<1	3.5	<0.1 *	<0.5	<0.5	<1
MK-9A	02/20/90		<1	<5	<0.5	<0.5	<0.5	<0.5	<1	<1	<0.5	<1	<0.5	<1	<0.5	<0.5	<0.22 *	<0.5	<1
MW-3A	02/20/90		<1	<5	<0.5	<0.5	<0.5	<0.5	<1	<1	<0.5	<1	<0.5	<1	<0.5	<0.5	<0.4 *	<0.5	<0.1
MW-4A	03/02/90		<1	<5	<0.5	<0.5	<0.5	<0.5	<1	<1	<0.5	<1	<0.5	<1	<0.5	<0.5	<4.3 *	0.16 *	0.37 *
MW-5A	02/23/90	b	<100	<500	<0.5	200	280	<50	<100	<100	20	<100	20,000	130	1300	<0.5	<0.2 *	0.3 *	0.6
MW-5A DUP	02/23/90	b	<100	<500	<0.5	190	250	<50	<100	<100	16	<100	20,000	110	1300	<0.5	<0.2 *	0.2 *	0.4 *
MW-5A	05/25/90	**	<500	<500	<400	<200	<400	<500	<600	<300	<500	<500	310,000	<500	700	NA	NA	NA	NA
MW-6A	02/23/90		34	<50	<0.5	<5	600	<5	<10	<10	<5	<10	920	<20	81	0.2 *	<0.5	<0.5	<1
MW-7A	03/02/90		100	<50	<0.5	3.5 *	980	<5	<10	<10	<5	<10	930	<10	180	<0.1 *	<4.3 *	<0.5	0.52 *
MW-8A	02/20/90		110	<50	<0.5	<5	410	<5	<10	<10	<5	<10	3.2 *	<20	<5	<0.2 *	<0.4 *	<0.5	<1
MW-9A	02/15/90		<1	0.4 *	<0.5	<0.5	5	<0.5	<1	<1	<0.5	<1	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<1

TABLE 12
WATER-QUALITY DATA SUMMARY
VOLATILE ORGANIC COMPOUNDS
BRISBANE RAILYARD
(All results in parts per billion)

Sample ID	Date of Sample	Foot-note	Vinyl Chloride	Chloro-ethane	1,1-DCA	1,1-DCE	1,2-DCE cis/trans	Chloro-form	Freon 113	1,2-DCA	1,1,1-TCA	1,2-DCP	TCE	1,1,2-TCA	PCE	Benzene	Toluene	Ethyl-benzene	Total Xylenes
MCL			1	NE	NE	7	NE	100	NE	5	200	NE	5	NE	NE	5.0	NE	NE	1,750
DWAL			0.5	NE	5	6	6	100	1200	0.5	200	10	5	32	5	1.0	100	680	1,750
MW-10A	02/28/90		<1	<5	<0.5	<0.5	<0.5	<0.5	<1	<1	<0.5	<1	<0.5	<1	<0.5	<0.5	<0.29 *	<0.5	<1
MW-10A DUP	02/28/90		<1	<5	<0.5	<0.5	<0.5	<0.5	<1	<1	<0.5	<1	<0.5	<1	<0.5	<0.5	<0.29 *	<0.5	<1
MW-11A	05/08/90	**	<0.5	<0.5	<0.4	<0.2	<0.4	<0.5	<0.6	<0.3	<0.5	<0.5	<0.3	<0.6	<0.5	NA	NA	NA	NA
MW-11A	05/08/90		<4	<4	<3	<3	<3	<3	<3	<3	<3	<3	<4	<3	<4	<2	<2	<3	<3
MW-13A	02/26/90		<5	<25	<0.5	<2.5	<2.5	<2.5	<5	<5	<2.5	<5	<2.5	<5	<2.5	1	6	6.8	14
MW-15A	03/02/90		<1	5.8	0.5	<0.5	0.4 *	<0.5	<1	<1	<0.5	<1	0.7	<1	<0.5	1.5	<4.3 *	<5	<10
MW-16A	03/05/90	a	<1	<5	<0.5	<0.5	0.22 *	<0.5	0.26 *	<1	<0.5	<1	<0.5	<1	<0.5	0.3 *	<0.11 *	<0.5	<1
MW-17A	03/05/90		<1	3.2 *	<0.5	<0.5	<0.5	<0.5	<1	<1	<0.5	<1	<0.5	<1	<0.5	<0.5	<0.11 *	<0.5	<1
B-Zone Wells																			
KMW-3B	02/15/90		<1	<5	<0.5	<0.5	<0.5	<0.5	<1	<1	<0.5	<1	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<1
KMW-6B	03/06/90		<1	<5	<0.5	<0.5	<0.5	0.1 *	0.31 *	<1	<0.5	<1	<0.5	<1	<0.5	0.16 *	<0.2 *	0.11 *	0.75 *
LF-2B	05/08/90		<4	<4	<3	<3	<3	<3	<3	<3	<3	<3	<4	<3	<4	<2	<2	<3	<3
LF-3B	05/07/90		<4	<4	<3	<3	<3	<3	<3	<3	<3	<3	27	<3	11	<2	<2	<3	<3
LF-4B	05/10/90		<4	<4	<3	<3	<3	<3	<3	<3	<3	<3	<4	<3	<4	<2	<2	<3	<3
LF-5B	05/09/90		<4	<4	<3	<3	<3	<3	<3	<3	<3	<3	<4	<3	<4	<2	<2	<3	<3
LF-6B	05/10/90		<4	<4	<3	<3	<3	<3	<3	<3	<3	<3	<4	<3	<4	<2	<2	<3	<3
LF-8B	05/22/90		<4	<4	<3	<3	<3	<3	<3	<3	<3	<3	<4	<3	<4	<2	<2	<3	<3
LF-9B	05/22/90		<4	<4	<3	6	5	<3	<3	<3	<3	<3	24,000	8	2,900	<2	<2	<3	<3
LF-9B DUP	05/22/90	**	<500	<500	<400	<200	<400	<500	<600	<300	<500	<500	28,000	<600	2,500	NA	NA	NA	NA

TABLE 12
WATER-QUALITY DATA SUMMARY
VOLATILE ORGANIC COMPOUNDS
BRISBANE RAILYARD
(All results in parts per billion)

Sample ID	Date of Sample	Foot-note	Vinyl Chloride	Chloro-ethane	1,1-DCA	1,1-DCE	1,2-DCE cis/trans	Chloro-form	Freon 113	1,2-DCA	1,1,1-TCA	1,2-DCP	TCE	1,1,2-TCA	PCE	Benzene	Toluene	Ethyl-benzene	Total Xylenes
MCL			1	NE	NE	7	NE	100	NE	5	200	NE	5	NE	NE	5.0	NE	NE	1,750
DWAL			0.5	NE	5	6	6	100	1200	0.5	200	10	5	32	5	1.0	100	680	1,750
LF-10B	05/22/90	g	<4	<4	<3	25	<3	5	<3	<3	8	7	28,000	200	3,000	<2	3	<3	<3
MK-3B	02/20/90		<1	<5	<0.5	<0.5	<0.5	<0.5	<1	<1	<0.5	<1	<0.5	<1	<0.5	<0.5	<0.4 *	<0.5	<0.1
MK-4B	02/15/90		<1	<5	<0.5	<0.5	<0.5	<0.5	<1	<1	<0.5	<1	0.4	<1	<0.5	<0.5	<0.2 *	<0.5	<1
MK-6B	02/22/90		<1	<5	<0.5	<0.5	<0.5	<0.5	<1	<1	<0.5	<1	<0.5	<1	<0.5	<0.5	0.32 *	<0.5	<1
MK-7B	02/27/90		<1	<5	<0.5	<0.5	<0.5	<0.5	<1	<1	<0.5	<1	<0.5	<1	<0.5	<0.5	<0.2 *	<0.5	0.6 *
MK-9B	02/20/90		<1	<5	<0.5	<0.5	<0.5	<0.5	<1	<1	<0.5	<1	<0.5	<1	<0.5	<0.5	<0.22 *	<0.5	<1
MW-1B	02/21/90		<1	<5	<0.5	<0.5	<0.5	<0.5	<1	<1	<0.5	<1	<0.5	<1	<0.5	<0.5	<0.22 *	<0.5	<1
MW-2B	03/02/90		<1	<5	<0.5	<0.5	<0.5	<0.5	<1	<1	<0.5	<1	<0.5	<1	<0.5	<0.1 *	<4.3 *	0.17 *	0.74
MW-5B	02/23/90		<1	<5	<0.5	<0.5	<0.5	0.1	<1	<1	<0.5	<1	35	<1	1	<0.5	<0.2 *	<0.5	<1
MW-5B DUP	02/23/90		<1	<5	<0.5	<0.5	<0.5	0.1	<1	<1	<0.5	<1	31	<1	1	<0.5	<0.2 *	<0.5	<1
MW-6B	02/23/90		<1	<5	<0.5	<0.5	<0.5	0.3	<1	<1	<0.5	<1	49	<1	2.1	0.5	<0.5	<0.5	<1
MW-8B	02/20/90		<1	<5	<0.5	<0.5	<0.5	<0.5	<1	<1	<0.5	<1	<0.5	<100	<100	<0.2 *	<0.4 *	<0.5	0.4 *
MW-9B	02/15/90		<1	<5	<0.5	<0.5	<0.5	<0.5	<1	<1	<0.5	<1	<0.5	<1	<0.5	<0.5	<0.2 *	<0.5	<1
MW-10B	02/28/90		<1	<5	<0.5	<0.5	<0.5	<0.5	<1	<1	<0.5	<1	<0.5	<1	<0.5	0.17 *	<0.29 *	0.34 *	<1
MW-11B	03/02/90		<1	<5	<0.5	<0.5	<0.5	<0.5	<1	<1	<0.5	<1	<0.5	<1	<0.5	<0.5	<4.3 *	<0.5	<1
MW-13B	02/26/90		<1	<5	<0.5	<0.5	<0.5	<0.5	<1	<1	<0.5	<1	<0.5	<1	<0.5	<0.5	<0.2 *	<0.5	0.2 *
MW-16B	03/05/90		<1	<5	<0.5	<0.5	<0.5	<0.5	0.32 *	<1	<0.5	<1	<0.5	<1	<0.5	<0.5	0.22 *	<0.5	<1
MW-17B	03/05/90		<1	<5	<0.5	<0.5	<0.5	<0.5	<1	<1	<0.5	<1	<0.5	<1	<0.5	<0.5	0.11 *	<0.5	<1

TABLE 12
WATER-QUALITY DATA SUMMARY
VOLATILE ORGANIC COMPOUNDS
BRISBANE RAILYARD
(All results in parts per billion)

Sample ID	Date of Sample	Foot-note	Vinyl Chloride	Chloro-ethane	1,1-DCA	1,1-DCE	1,2-DCE cis/trans	Chloro-form	Freon 113	1,2-DCA	1,1,1-TCA	1,2-DCP	TCE	1,1,2-TCA	PCE	Benzene	Toluene	Ethyl-benzene	Total Xylenes
MCL			1	NE	NE	7	NE	100	NE	5	200	NE	5	NE	NE	5.0	NE	NE	1,750
DWAL			0.5	NE	5	6	6	100	1200	0.5	200	10	5	32	5	1.0	100	680	1,750
QAQC																			
Equipment Blanks:																			
EQ MK-4B-FB	02/15/90		<1	<5	<0.5	<0.5	<0.5	0.11 *	<1	<1	<0.5	<1	<0.5	<1	<0.5	<0.5	0.2 *	<0.5	<1
EQ MK-9B-FB	02/20/90		<1	<5	<0.5	<0.5	<0.5	<0.5	<1	<1	<0.5	<1	<0.5	<1	<0.5	<0.5	0.22 *	<0.5	<1
EQ MW-8B-FB	02/21/90		<1	<5	<0.5	<0.5	<0.5	0.15 *	<1	<1	<0.5	<1	<0.5	<100	<100	0.2	0.4 *	<0.5	<0.1
EQ MK-2A-FB	02/22/90		<1	<5	<0.5	<0.5	<0.5	<0.5	<1	<1	<0.5	<1	<0.5	<1	<0.5	<0.5	1.1	<0.5	<1
EQ MW-6B-FB	02/23/90		<1	<5	<0.5	<0.5	<0.5	<0.5	<1	<1	<0.5	<1	<0.5	<1	<0.5	<0.5	0.2 *	<0.5	<1
EQ MW-13A-FB	02/26/90		<1	<5	<0.5	<0.5	<0.5	<0.5	<1	<1	<0.5	<1	<0.5	<1	<0.5	<0.5	0.2 *	<0.5	<1
EQ MK-7B-EB	02/27/90		<1	<5	<0.5	<0.5	<0.5	<0.5	<1	<1	<0.5	<1	<0.5	<1	<0.5	<0.5	0.2 *	<0.5	<1
EQ KMW-7A-EB	02/28/90		<1	<5	<0.5	<0.5	<0.5	<0.5	<1	<1	<0.5	<1	<0.5	<1	<0.5	<0.5	0.29 *	<0.5	<1
EQ MW-16A-EB	03/02/90		<1	<5	<0.5	<0.5	<0.5	<0.5	<1	<1	<0.5	<1	<0.5	<1	<0.5	<0.5	0.11 *	<0.5	<1
EQ MW-4A-EB	03/02/90		<1	<5	<0.5	<0.5	<0.5	<0.5	<1	<1	<0.5	<1	<0.5	<1	<0.5	0.1 *	4.3	<0.5	<1
EQ KMW-6B-EB	03/06/90	c	<1	<5	<0.5	<0.5	<0.5	<0.5	0.29 *	0.26 *	<0.5	<1	<0.5	<1	<0.5	<0.5	0.2 *	<0.5	<1
EQ LF-1A-FB	05/02/90		<4	<4	<3	<3	<3	<3	<3	<3	<3	<3	<4	<3	<4	<2	<2	<3	<3
EQ LF-3A-FB	05/03/90		<4	<4	<3	<3	<3	<3	<3	<3	<3	<3	<4	<3	<4	<2	<2	<3	<3
EQ LF-5A-FB	05/04/90		<4	<4	<3	<3	<3	<3	<3	<3	<3	<3	<4	<3	<4	<2	<2	<3	<3
EQ LF-3B-FB	05/07/90		<4	<4	<3	<3	<3	<3	<3	<3	<3	<3	<4	<3	<4	<2	<2	<3	<3
EQ MW-11A-FB	05/08/90		<4	<4	<3	<3	<3	<3	<3	<3	<3	<3	<4	<3	<4	<2	<2	<3	<3
EQ LF-5B-FB	05/09/90		<4	<4	<3	<3	<3	<3	<3	<3	<3	<3	<4	<3	<4	<2	<2	<3	<3

TABLE 12
WATER-QUALITY DATA SUMMARY
VOLATILE ORGANIC COMPOUNDS
BRISBANE RAILYARD
(All results in parts per billion)

Sample ID	Date of Sample	Foot-note	Vinyl Chloride	Chloro-ethane	1,1-DCA	1,1-DCE	1,2-DCE cis/trans	Chloro-form	Freon 113	1,2-DCA	1,1,1-TCA	1,2-DCP	TCE	1,1,2-TCA	PCE	Benzene	Toluene	Ethyl-benzene	Total Xylenes
MCL			1	NE	NE	7	NE	100	NE	5	200	NE	5	NE	NE	5.0	NE	NE	1,750
DWAL			0.5	NE	5	6	6	100	1200	0.5	200	10	5	32	5	1.0	100	680	1,750
EQ LF-10B-FB	05/22/90	**	<0.5	<0.5	<0.4	<0.2	<0.4	<0.5	<0.6	<0.3	<0.5	<0.5	<0.3	<0.6	<0.5	NA	NA	NA	NA
EQ MW-5A-FB	05/25/90	**	<0.5	<0.5	<0.4	<0.2	<0.4	<0.5	<0.6	<0.3	<0.5	<0.5	1.3	<0.6	<0.5	NA	NA	NA	NA
Trip Blanks:																			
FB	02/26/90		<1	<5	<0.5	<0.5	<0.5	<0.5	<1	<1	<0.5	<1	<0.5	<1	<0.5	<0.5	0.2 *	<0.5	<1
FB	02/27/90		<1	<5	<0.5	<0.5	<0.5	1.8	<1	<1	<0.5	1.8	<0.5	<1	<0.5	<0.5	0.2 *	<0.5	<1
FB	02/28/90		<1	<5	0.41	0.41	<0.5	1.6	<1	<1	<0.5	1.7	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<1
Water Supply:																			
TAP 2	02/14/90	d	<1	<5	<0.5	<0.5	<0.5	33	<1	<1	<0.5	<1	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<1

TABLE 12
WATER-QUALITY DATA SUMMARY
VOLATILE ORGANIC COMPOUNDS
BRISBANE RAILYARD
(All results in parts per billion)

Sample ID	Date of Sample	Foot-note	Vinyl Chloride	Chloro-ethane	1,1-DCA	1,1-DCE	1,2-DCE cis/trans	Chloro-form	Freon 113	1,2-DCA	1,1,1-TCA	1,2-DCP	TCE	1,1,2-TCA	PCE	Benzene	Toluene	Ethyl-benzene	Total Xylenes
MCL			1	NE	NE	7	NE	100	NE	5	200	NE	5	NE	NE	5.0	NE	NE	1,750
DWAL			0.5	NE	5	6	6	100	1200	0.5	200	10	5	32	5	1.0	100	680	1,750

NOTES:

* = Result below authorized analytic laboratory reporting limit and/or is an estimated concentration.
** = This sample analyzed by EPA Method 8010. All other samples were analyzed by EPA Method 8240.
*** = Tentative identification.
a = Sample also contained 0.24 ppb 1,2-dichlorobenzene. *
b = Samples also contained 0.1 ppb chlorobenzene. *
c = Samples also contained 1.5 ppb methylene chloride. *
d = Sample also contained 4.8 ppb bromodichloromethane.
TAP 2 was sample of water used for steam-cleaning equipment and grouting wells.
e = Sample also contained 1.6 ppb methylene chloride.
f = Sample also contained 6.2 ppb chlorobenzene and 0.6 ppb carbon tetrachloride.
g = Sample also contained 15 ppb carbon tetrachloride.

MCL = Environmental Protection Agency Maximum Contaminant Level for Drinking Water
DWAL = State Department of Health Services Drinking Water Action Level
NE = Not Established
NA = Not Analyzed

TABLE 13
WATER-QUALITY DATA SUMMARY
SEMI-VOLATILE ORGANIC COMPOUNDS
BRISBANE RAILYARD
(All results in parts per million)

Sample ID	Date of Sample	Acenaphthene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benzo(a)anthracene	Bis-(2-ethylhexyl) phthalate	Chrysene	Naphthalene
A-Zone Wells											
LF-1A	05/02/90	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.004	<0.002
LF-3A	05/03/90	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.060*	<0.004	<0.002
LF-4A	05/04/90	0.015	0.020	0.055	<0.002	0.004	0.071	<0.002	0.550	<0.004	<0.002
LF-7A	05/02/90	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.004	<0.002
MW-11A	05/15/90	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.004	<0.002
B-Zone Wells											
LF-3B	05/15/90	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.11*	<0.004	<0.002
LF-4B	05/15/90	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.110*	<0.004	<0.002
LF-6B	05/15/90	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.110*	<0.004	<0.002

Analyses conducted using EPA Method 8270.
* = Result is an estimated concentration.

TABLE 14
WATER-QUALITY DATA SUMMARY
TITLE 22 METALS
BRISBANE RAILYARD
(All results in parts per million)

Sample ID	Date of Sample	Arsenic	Antimony	Barium	Beryllium	Cadmium	Total Chromium	Chromium 6	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
EPA Maximum Contaminant Levels		0.05	NE	1	NE	0.01	NE	0.005	NE	1	0.05	0.002	NE	NE	0.01	0.05	NE	NE	5
A-Zone Wells																			
KMW-7A	02/28/90	0.035	<0.05	0.065	<0.002	<0.005	<0.01	<0.01	<0.01	<0.01	<0.005	<0.0002	<0.02	<0.04	<0.2	<0.01	<2	<0.01	<0.01
LF-3A	05/03/90	0.006	<0.05	0.05	<0.005	<0.005	<0.05	NA	<0.05	<0.05	<0.05	<0.01	<0.05	<0.05	<0.005	<0.05	<0.05	<0.05	<0.05
LF-4A	05/04/90	0.43	<0.05	0.62	<0.005	<0.005	<0.05	NA	<0.05	<0.05	<0.05	<0.01	<0.05	<0.05	<0.005	<0.05	<0.05	<0.05	<0.05
LF-5A	05/04/90	<0.005	<0.05	0.34	<0.005	<0.005	<0.05	NA	<0.05	<0.05	<0.05	<0.01	<0.05	<0.05	0.007	<0.05	<0.05	<0.05	<0.05
LF-7A	05/02/90	<0.005	<0.05	0.12	<0.005	<0.005	<0.05	NA	<0.05	<0.05	<0.05	<0.01	<0.05	<0.05	<0.005	<0.05	<0.05	<0.05	<0.05
LF-7A DUP*	05/02/90	<0.005	<1.0	<5.0	<0.050	<0.005	<0.50	NA	<5.0	<2.0	<0.005	<0.0002	<30.0	<2.0	<0.20	<0.50	<2	<2	<20.0
LF-8A	05/02/90	0.04	<0.05	0.89	<0.005	<0.005	<0.05	NA	<0.05	<0.05	<0.05	<0.01	<0.05	<0.05	<0.01	<0.05	<0.05	<0.05	<0.05
MK-1A	02/21/90	0.011	<0.05	0.1	<0.002	<0.005	<0.01	NA	<0.01	<0.01	<0.005	<0.0002	<0.02	<0.04	<0.2	<0.01	<2	<0.01	<0.01
MK-2A	02/22/90	<0.005	<0.05	0.048	<0.002	<0.005	<0.01	<0.01	<0.01	0.013	<0.005	<0.0004	<0.02	<0.04	<0.2	<0.01	<2	<0.01	0.016
MK-6A	02/22/90	0.049	<0.05	0.076	<0.002	<0.005	<0.01	<0.01	<0.01	<0.01	<0.005	<0.0002	<0.02	<0.04	<0.2	<0.01	<2	<0.01	<20
MK-7A	06/20/90	<0.005	<0.05	0.15	<0.005	<0.005	<0.05	NA	<0.05	<0.05	<0.05	<0.0005	<0.05	<0.05	<0.005	<0.05	<0.05	<0.05	<0.05
MK-8A	02/23/90	<0.005	<0.05	0.036	<0.002	<0.005	<0.01	<0.01	<0.01	0.033	<0.005	<0.0002	<0.02	<0.04	<0.2	<0.01	<2	<0.01	0.72
MK-8A DUP	02/24/90	<0.005	<0.05	0.036	<0.002	<0.005	<0.01	<0.01	<0.01	0.029	<0.005	<0.0002	<0.02	<0.04	<0.2	<0.01	<2	<0.01	0.69
MK-9A	02/21/90	<0.005	<0.05	0.065	<0.002	<0.005	<0.01	NA	<0.01	<0.01	<0.005	0.0004	<0.02	<0.04	<0.2	<0.01	<2	0.013	<0.01
MW-10A	02/28/90	0.038	<0.05	0.041	<0.002	<0.005	<0.01	<0.01	<0.01	<0.01	<0.005	<0.0004	<0.02	<0.04	<0.2	<0.01	<2	<0.01	0.014
MW-10A DUP	02/28/90	0.035	<0.05	0.041	<0.002	<0.005	<0.01	<0.01	<0.01	<0.01	<0.005	<0.0002	<0.02	<0.04	<0.2	<0.01	<2	<0.01	<0.01
MW-11A	05/08/90	0.046	<0.05	0.10	<0.005	<0.005	<0.05	NA	<0.05	<0.05	<0.05	<0.01	<0.05	<0.05	<0.005	<0.05	<0.05	<0.05	<0.05
MW-15A	03/02/90	0.012	<0.05	0.23	<0.002	<0.005	<0.01	<0.01	<0.01	<0.01	<0.005	<0.0002	<0.02	<0.04	<0.2	<0.01	<2	<0.01	<0.01
MW-16A	03/05/90	<0.005	<0.05	0.12	<0.002	<0.005	<0.01	<0.01	<0.01	<0.01	<0.005	<0.0002	<0.02	<0.04	<0.2	<0.01	<2	<0.01	<0.01
MW-17A	03/05/90	<0.005	<0.05	0.13	<0.002	<0.005	<0.01	<0.01	<0.01	<0.01	<0.005	<0.0002	<0.02	<0.04	<0.2	<0.01	<2	<0.01	<0.01

TABLE 14
WATER-QUALITY DATA SUMMARY
TITLE 22 METALS
BRISBANE RAILYARD
(All results in parts per million)

Sample ID	Date of Sample	Arsenic	Antimony	Barium	Beryllium	Cadmium	Total Chromium	Chromium 6	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
EPA Maximum Contaminant Levels		0.05	NE	1	NE	0.01	NE	0.005	NE	1	0.05	0.002	NE	NE	0.01	0.05	NE	NE	5
B-Zone Wells																			
KMW-6B	03/06/90	<0.005	<0.05	6.4	<0.002	<0.005	<0.01	NA	0.01	<0.01	<0.005	<0.0002	<0.02	<0.04	<0.2	<0.01	<2	<0.01	<0.01
LF-3B	05/07/90	<0.005	<0.05	0.18	<0.005	<0.005	<0.05	NA	<0.05	<0.05	<0.05	<0.01	<0.05	<0.05	<0.005	<0.05	<0.05	<0.05	0.06
LF-4B	05/10/90	<0.005	<0.05	0.20	<0.005	<0.005	<0.05	NA	<0.05	<0.05	<0.05	<0.01	<0.05	<0.05	<0.005	<0.05	<0.05	<0.05	<0.05
LF-5B	05/09/90	<0.005	<0.05	0.14	<0.005	<0.005	<0.05	NA	<0.05	<0.05	<0.05	<0.01	<0.05	<0.05	<0.005	<0.05	<0.05	<0.05	<0.05
LF-6B	05/10/90	<0.005	<0.05	0.39	<0.005	<0.005	<0.05	NA	<0.05	<0.05	<0.05	<0.01	<0.05	<0.05	<0.005	<0.05	<0.05	<0.05	<0.05
LF-8B	05/22/90	<0.005	<0.05	0.50	<0.005	<0.005	<0.05	NA	<0.05	<0.05	<0.05	<0.0005	<0.05	<0.05	<0.01	<0.05	<0.05	<0.05	0.16
MK-6B	02/22/90	<0.005	<0.05	0.11	<0.002	<0.005	<0.01	<0.01	<0.01	<0.01	<0.005	<0.0002	<0.02	<0.04	<0.2	<0.01	<2	0.013	0.013
MK-7B	02/22/90	<0.1	<0.05	0.24	<0.002	<0.005	<0.01	<0.01	<0.01	0.011	<0.05	<0.0002	<0.02	<0.04	<0.2	<0.01	<2	<0.01	0.025
MK-9B	02/27/90	<0.005	<0.05	0.091	<0.002	<0.005	<0.01	<0.01	<0.01	<0.01	<0.005	<0.0004	<0.02	<0.04	<0.2	<0.01	<2	<0.01	<0.01
MW-1B	02/27/90	0.0079	<0.05	0.74	<0.002	<0.005	<0.01	<0.01	<0.01	<0.01	<0.005	NA	<0.02	<0.04	<0.2	<0.01	<2	0.014	<0.01
MW-2B	03/02/90	<0.005	<1	<5	<0.05	<0.005	<0.05	<0.01	<5	<2	<0.005	<0.0004	<30	<2	<0.2	<0.5	<2	<2	<20
MW-10B	02/28/90	0.02	<0.05	0.058	<0.002	<0.005	<0.01	<0.01	<0.01	<0.01	<0.005	<0.0002	<0.02	<0.04	<0.2	<0.01	<2	<0.01	<0.01
MW-11B	03/02/90	<0.005	<0.05	0.48	<0.002	<0.005	<0.01	<0.01	<0.01	<0.01	<0.005	<0.0002	<0.02	<0.04	<0.2	<0.01	<2	<0.01	<0.01
MW-12B	02/24/90	<0.005	<0.05	0.2	<0.002	<0.005	<0.01	<0.01	<0.01	<0.01	<0.005	<0.0002	<0.02	<0.04	<0.2	<0.01	<2	<0.01	0.013
MW-12B DUP	02/24/90	<0.005	<0.05	0.19	<0.002	<0.005	<0.01	<0.01	<0.01	0.015	<0.005	<0.0002	<0.02	<0.04	<0.2	<0.01	<2	<0.01	0.017
MW-16B	03/05/90	<0.005	<0.05	0.82	<0.002	<0.005	<0.01	<0.01	<0.01	<0.01	<0.005	<0.0002	<0.02	<0.04	<0.2	<0.01	<2	0.018	0.017
MW-17B	03/05/90	<0.005	<0.05	1.1	<0.002	<0.005	<0.01	<0.01	<0.01	<0.01	<0.005	<0.0002	<0.02	<0.04	<0.2	<0.01	<2	<0.01	<0.01

TABLE 14
WATER-QUALITY DATA SUMMARY
TITLE 22 METALS
BRISBANE RAILYARD
(All results in parts per million)

Sample ID	Date of Sample	Arsenic	Antimony	Barium	Beryllium	Cadmium	Total Chromium	Chromium 6	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
EPA Maximum Contaminant Levels		0.05	NE	1	NE	0.01	NE	0.005	NE	1	0.05	0.002	NE	NE	0.01	0.05	NE	NE	5
Surface Water																			
Ditch Middle	02/24/90	0.013	<0.05	0.09	<0.002	<0.005	<0.01	<0.01	<0.01	<0.01	<0.005	<0.0002	<0.02	<0.04	<0.2	<0.01	<2	<0.01	<0.01
Ditch North	02/26/90	<0.005	<0.05	0.019	<0.002	<0.005	<0.01	<0.01	<0.01	0.031	<0.005	<0.0002	<0.02	<0.04	<0.2	<0.01	<2	<0.01	0.01
Ditch North DUP	02/26/90	<0.005	<0.05	0.02	<0.002	<0.005	<0.01	NA	<0.01	0.036	<0.005	<0.0002	<0.02	<0.04	<0.2	<0.01	<2	<0.01	0.017
Ditch South	02/24/90	<0.005	<0.05	0.18	<0.002	<0.005	<0.01	<0.01	<0.01	<0.01	<0.005	<0.0002	<0.02	<0.04	<0.2	<0.01	<2	<0.01	0.089
TAP2 **	02/14/90	<0.005	<1	<5	<0.05	<0.005	<0.05	NA	<5	<2	<0.005	<0.0002	<30	<2	<0.2	<0.5	<2	2	<20

NOTES:
NA = Not Analyzed
NE = Not Established

* Duplicate analyzed by Enseco Laboratories.
** Water used for steam-cleaning equipment and grouting wells.

TABLE 15
WATER-QUALITY DATA SUMMARY
TOTAL PETROLEUM HYDROCARBONS
BRISBANE RAILYARD
(All results in mg/l [ppm])

Sample ID	Date of Sample	Lab	Diesel Fuel	Waste Oil	Gaso-line	Unknown Hydro-carbons	Comments
A-Zone Wells							
LF-3A	05/03/90	Clayton	3.0	4.4	<0.050	NA	
LF-4A	05/04/90	Clayton	72.0	21.0	0.540	NA	
LF-5A	05/04/90	Clayton	0.15	1.4	NA	NA	
LF-7A	05/02/90	Clayton	0.09	0.3	NA	NA	
LF-8A	05/02/90	Clayton	2.8	5.7	NA	NA	
MK-1A	02/27/90	Enseco	<0.1	NA	<0.1	<0.1	
MW-11A	05/08/90	Clayton	7.300	14.000	<0.050	NA	
MW-13A	03/06/90	Enseco	<0.1	NA	<0.1	<0.1	
MW-15A	03/02/90	Enseco	<10	NA	<10	92	C-9 TO C-22
MW-16A	03/05/90	Enseco	<0.3	NA	<0.3	2.6	C-10 TO C-26
MW-17A	03/05/90	Enseco	<0.1	NA	<0.1	0.2	C-10 to C-26
B-Zone Wells							
LF-3B	05/07/90	Clayton	<0.050	0.240	NA	NA	
LF-4B	05/10/90	Clayton	<0.050	<0.100	NA	NA	
LF-5B	05/09/90	Clayton	0.150	0.140	NA	NA	
LF-6B	05/10/90	Clayton	0.100	0.480	NA	NA	
LF-8B	05/22/90	Clayton	<0.050	<0.100	NA	NA	
MW-13B	03/06/90	Enseco	<0.1	NA	<0.1	<0.1	
MW-16B	03/05/90	Enseco	<0.1	NA	<0.1	<0.1 *	* Peak @ C-25 to C-26
MW-17B	03/05/90	Enseco	<0.1	NA	<0.1	<0.1 *	* Peak @ C-11 to C-12
Surface Water							
Ditch Middle	03/05/90	Enseco	<0.1	NA	<0.1	<0.1	
Ditch North	03/05/90	Enseco	<0.1	NA	<0.1	<0.1	
Ditch South	03/05/90	Enseco	<0.1	NA	<0.1	<0.1	

All TPH analyses were by modified EPA Method 8015.

SFC | SMC

OU-1 | OU-2

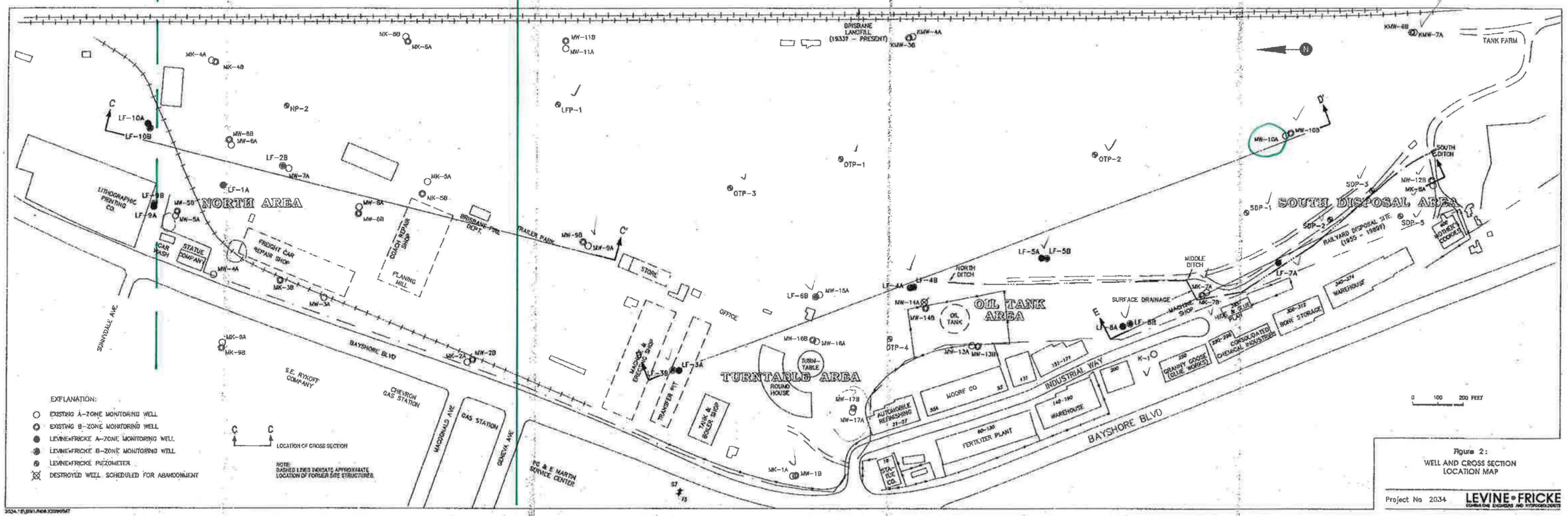


Figure 2:
WELL AND CROSS SECTION LOCATION MAP

Project No 2034 LEVINE•FRICKE

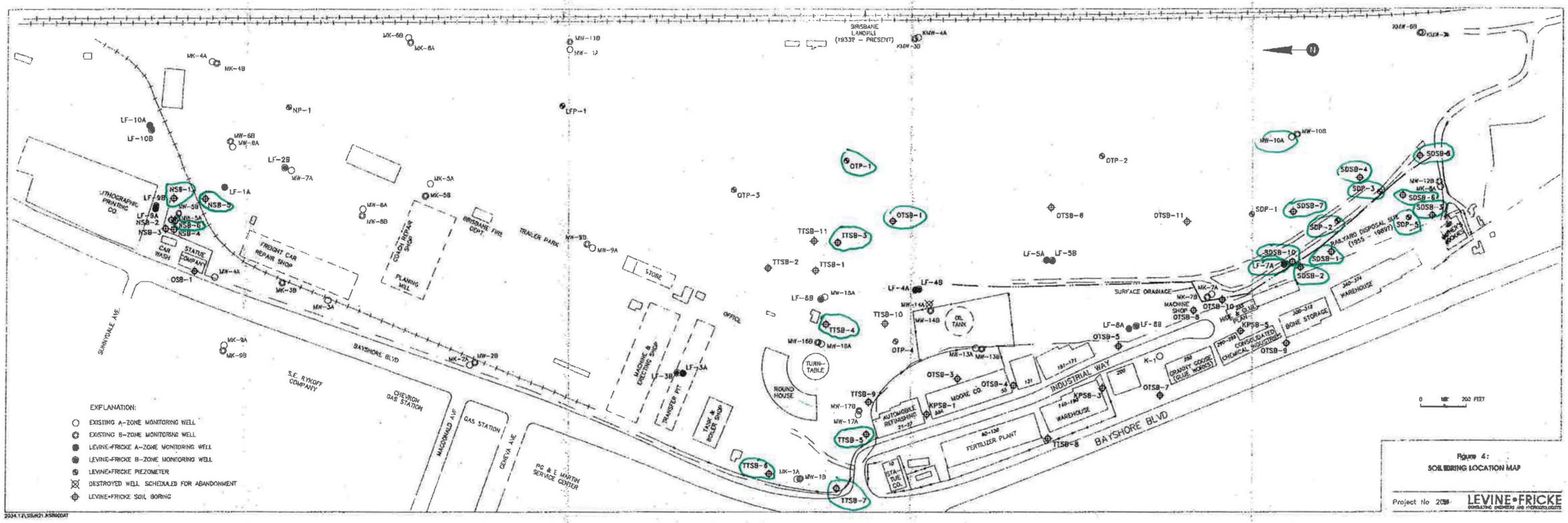


Figure 4:
SOIL BORING LOCATION MAP

Project No 2034

LEVINE•FRICKE
CONSULTING ENGINEERS AND HYDROGEOLOGISTS

2034.12\SUR21.KSR\GOAT

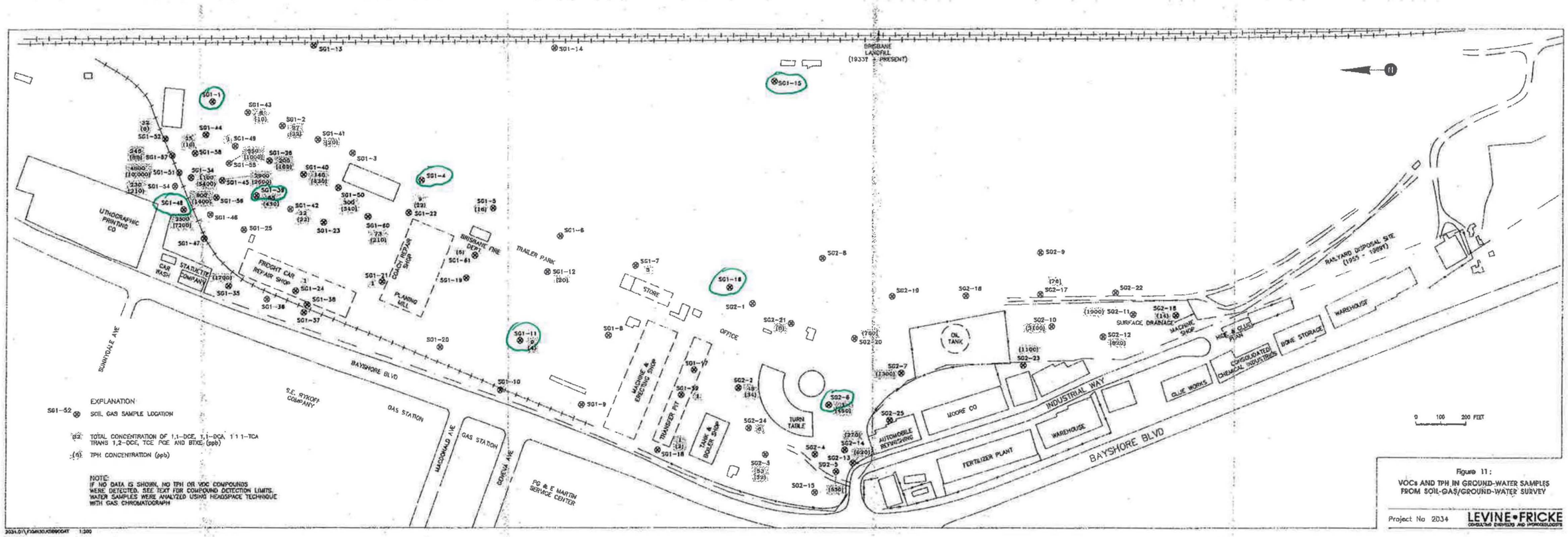


Figure 11 :
VOCs AND TPH IN GROUND-WATER SAMPLES FROM SOIL-GAS/GROUND-WATER SURVEY

Project No 2034 LEVINE•FRICKE CONSULTING ENGINEERS AND HYDROGEOLOGISTS

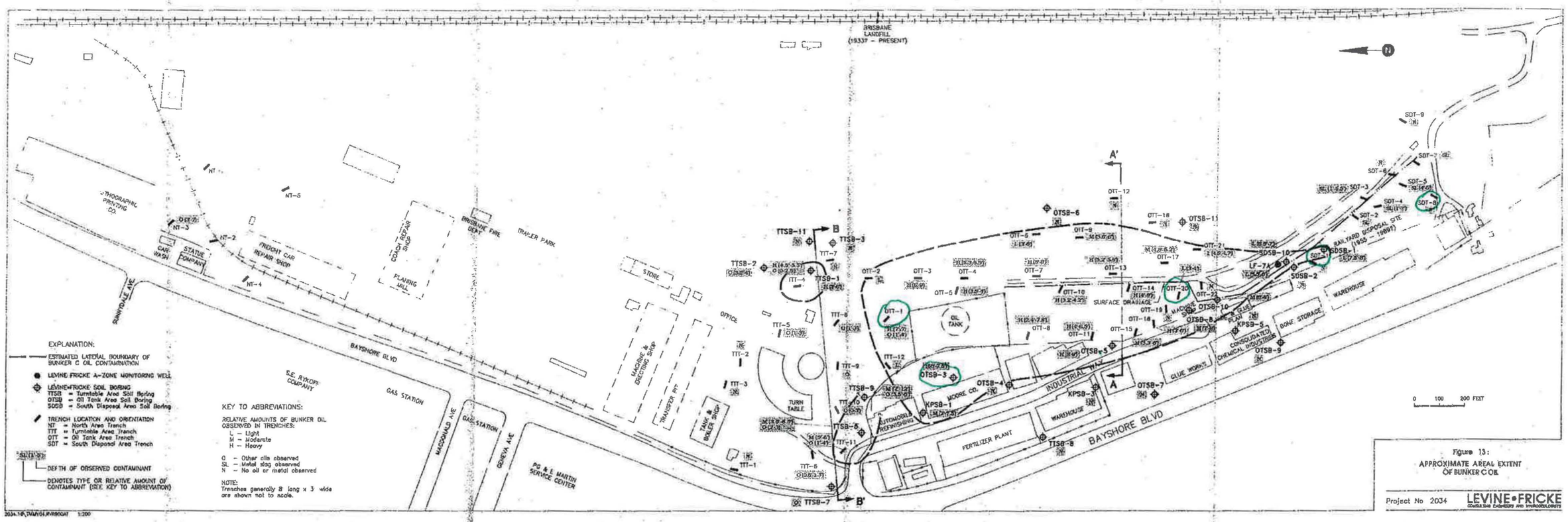
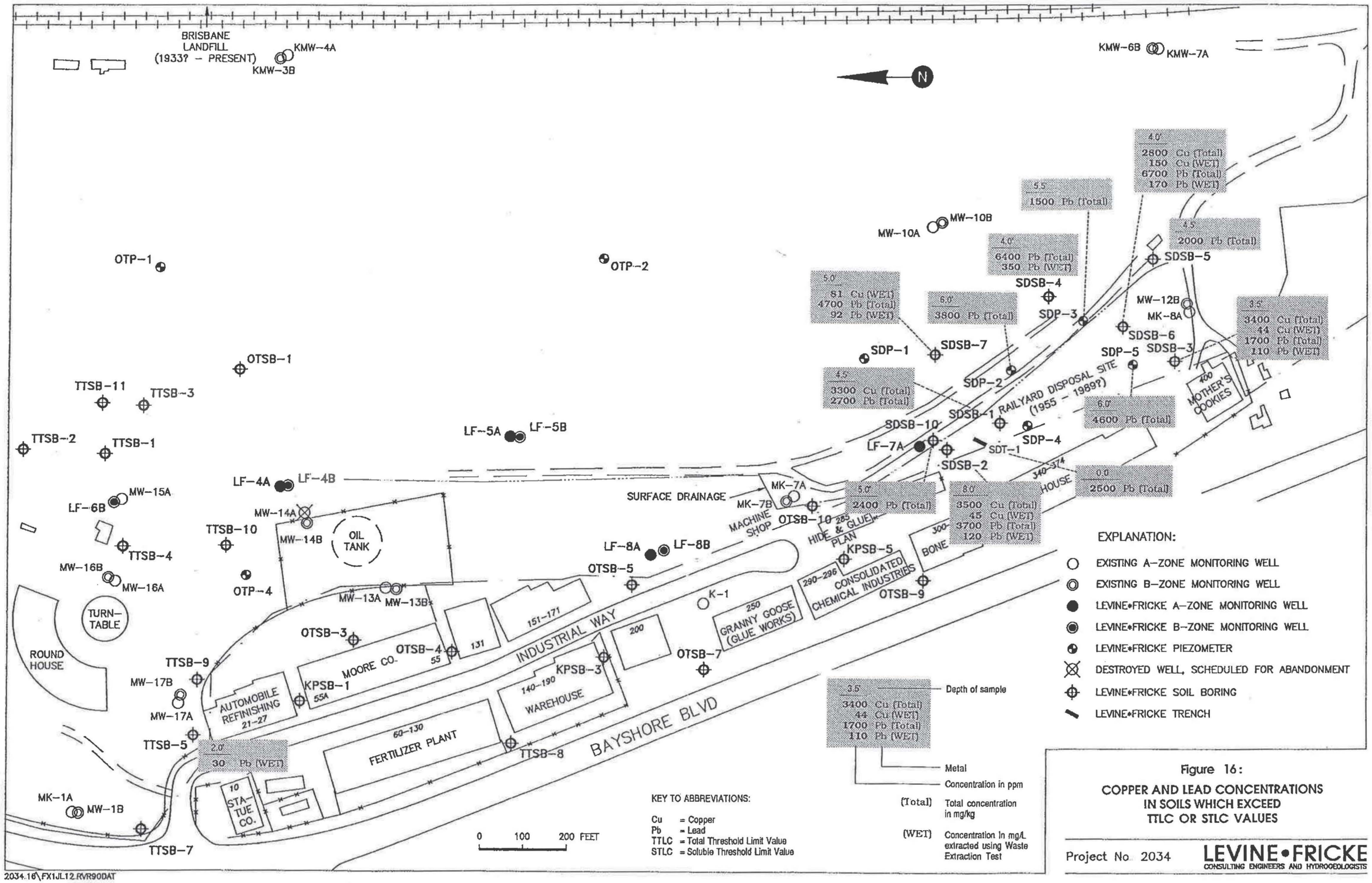


Figure 13:
APPROXIMATE AREAL EXTENT OF BUNKER C OIL

Project No 2034 LEVINE•FRICKE CONSULTING ENGINEERS AND ENVIRONMENTALISTS

OTSB-1 – Hot Spots
(see Fig. 4)



2034.16\FX1JL12.RVR90DAT

Figure 16:

COPPER AND LEAD CONCENTRATIONS IN SOILS WHICH EXCEED TTLC OR STLC VALUES

Project No. 2034

LEVINE•FRICKE
CONSULTING ENGINEERS AND HYDROGEOLOGISTS

123957

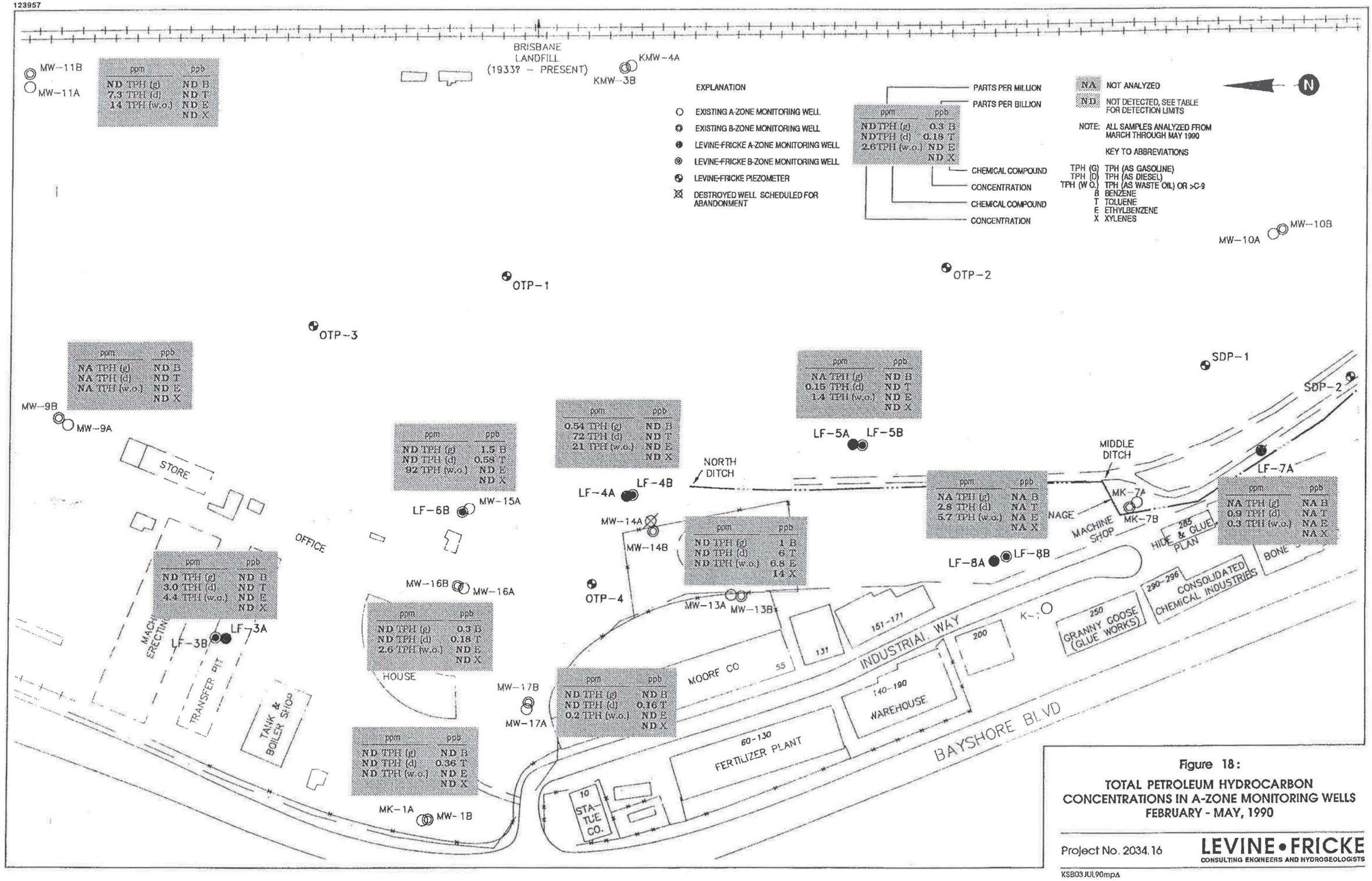


Figure 18:

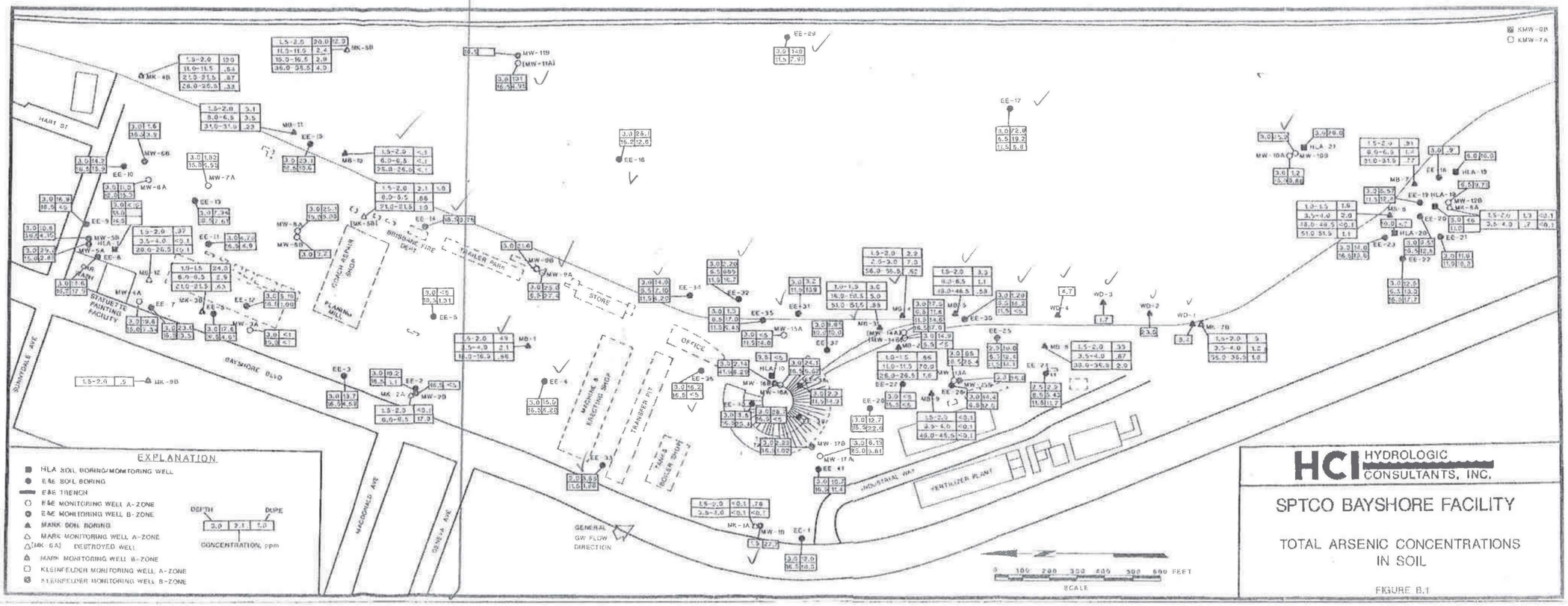
TOTAL PETROLEUM HYDROCARBON CONCENTRATIONS IN A-ZONE MONITORING WELLS FEBRUARY - MAY, 1990

Project No. 2034.16

LEVINE • FRICKE
CONSULTING ENGINEERS AND HYDROGEOLOGISTS

KSB03JUL90mpA

001 | 002

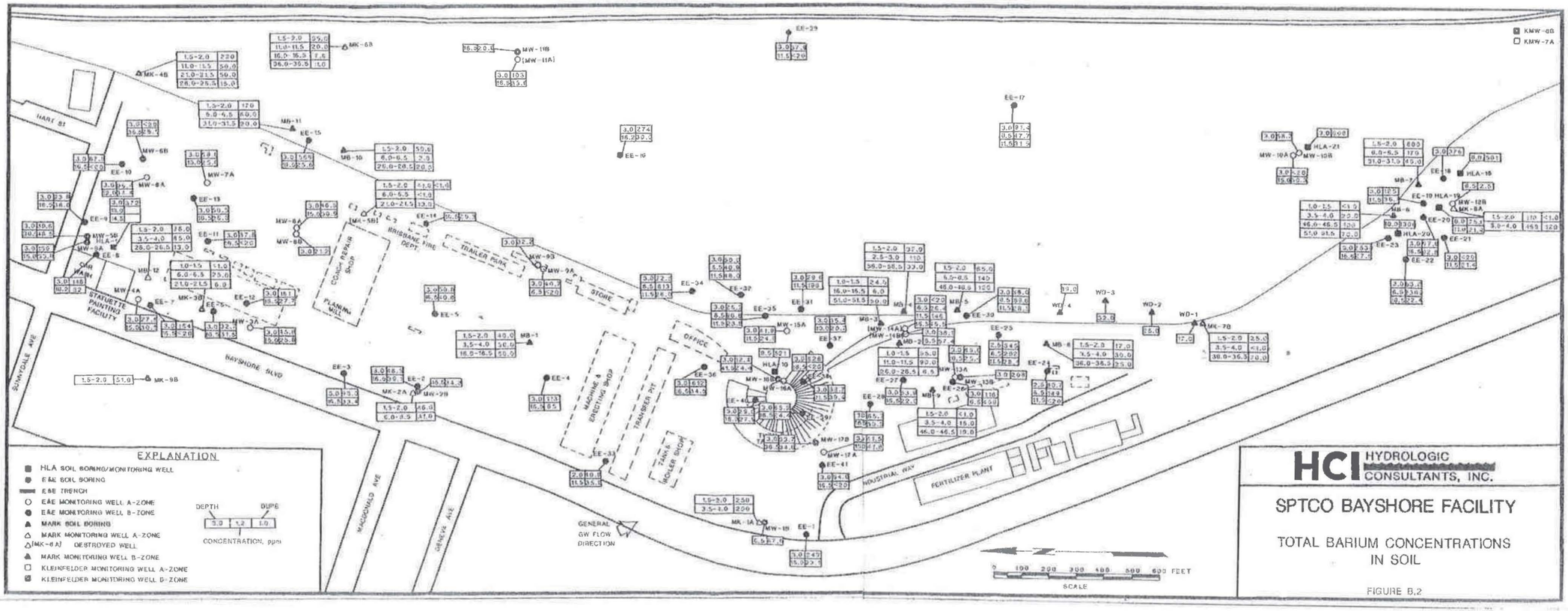


HCI HYDROLOGIC CONSULTANTS, INC.

SPTCO BAYSHORE FACILITY

TOTAL ARSENIC CONCENTRATIONS IN SOIL

FIGURE B.1

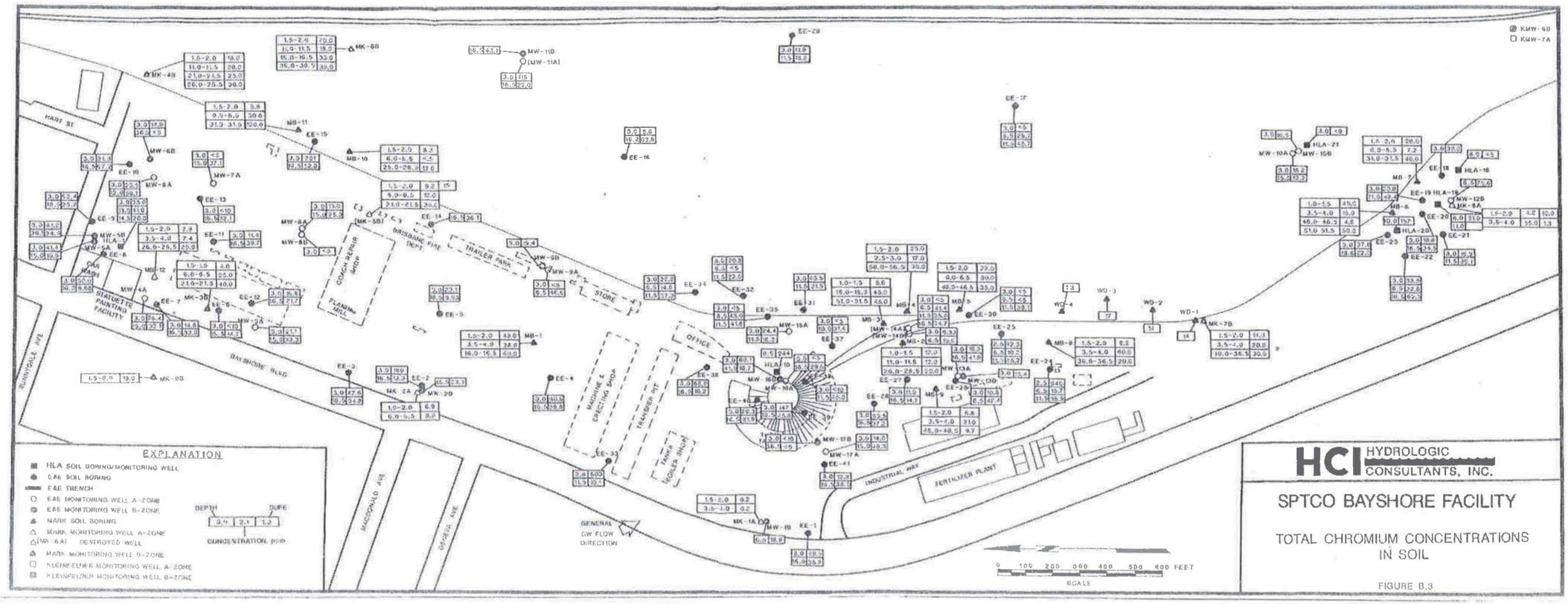


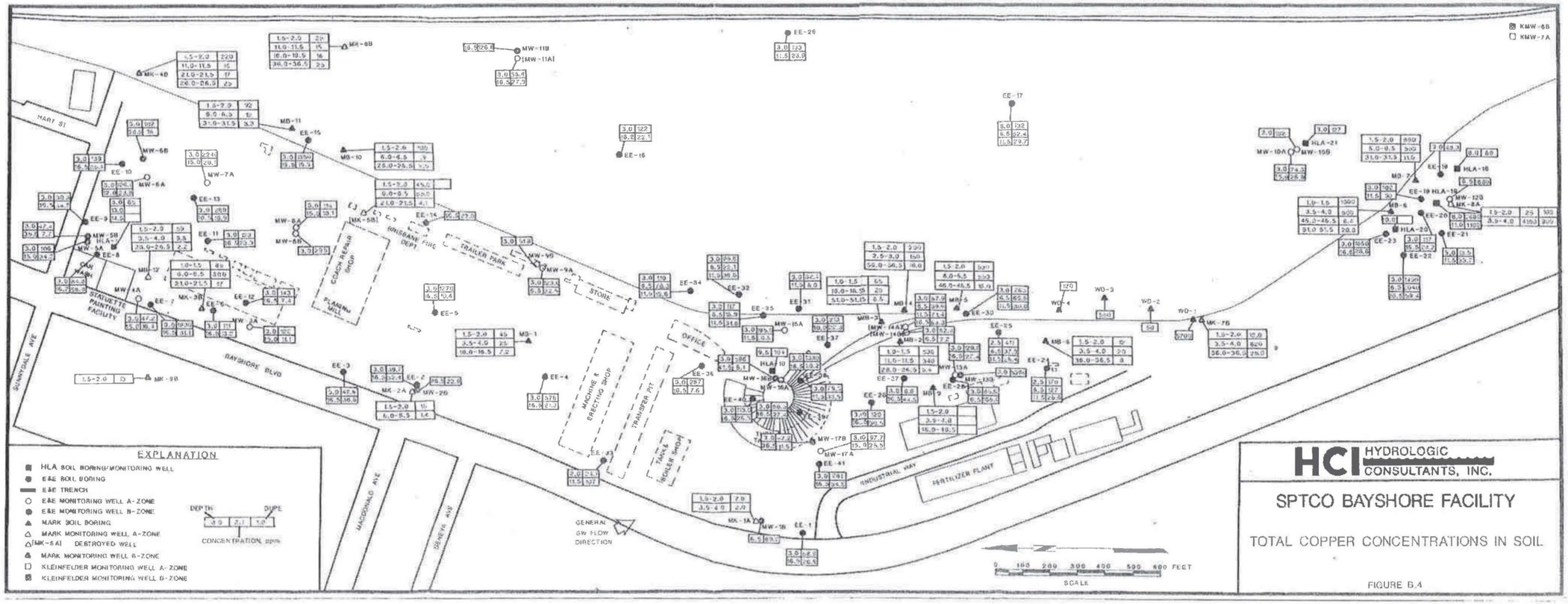
HCI HYDROLOGIC CONSULTANTS, INC.

SPTCO BAYSHORE FACILITY

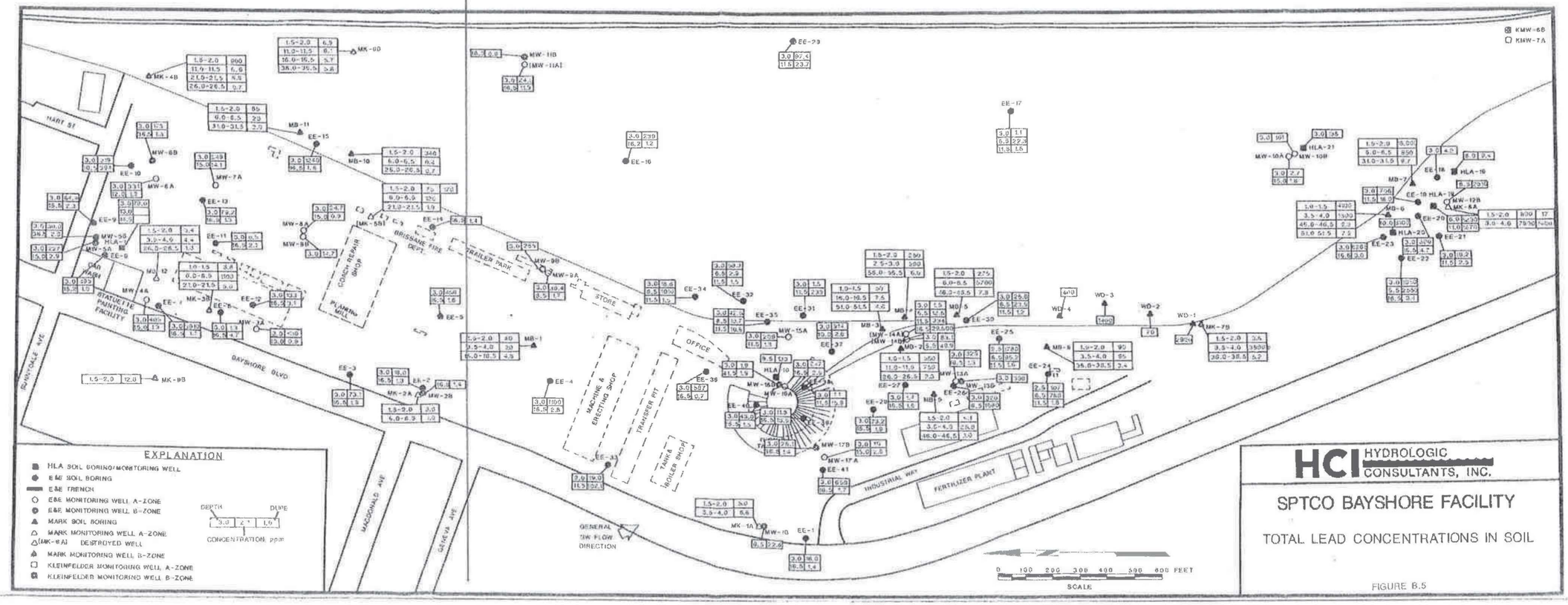
TOTAL BARIUM CONCENTRATIONS IN SOIL

FIGURE B.2


EXPLANATION
HLA SOIL BORING/MONITORING WELL
E&E SOIL BORING
E&E TRENCH
E&E MONITORING WELL A-ZONE
E&E MONITORING WELL B-ZONE
MARK SOIL BORING
MARK MONITORING WELL A-ZONE
MARK MONITORING WELL B-ZONE
NUTTER/ELDER MONITORING WELL A-ZONE
KLEINFELDER MONITORING WELL B-ZONE
DEPTH
DUPE
CONCENTRATION ppb
GENERAL GW FLOW DIRECTION
HART ST
BAYSHORE BLVD
INDUSTRIAL WAY
FERTILIZER PLANT
OFFICE
STORE
SCALE
0 100 200 300 400 500 600 FEET
HCI HYDROLOGIC CONSULTANTS, INC.
SPTCO BAYSHORE FACILITY
TOTAL CHROMIUM CONCENTRATIONS IN SOIL
FIGURE 8.3


EXPLANATION
HLA SOIL BORING/MONITORING WELL
E&E SOIL BORING
E&E TRENCH
E&E MONITORING WELL A-ZONE
E&E MONITORING WELL B-ZONE
MARK SOIL BORING
MARK MONITORING WELL A-ZONE
MARK MONITORING WELL B-ZONE
KLEINFELDER MONITORING WELL A-ZONE
KLEINFELDER MONITORING WELL B-ZONE
DEPTH
DEPTH
CONCENTRATION, ppm
HART ST
BAYSHORE BLVD
SUNNYDALE AVE
MACDONALD AVE
DESOTA AVE
INDUSTRIAL WAY
FERTILIZER PLANT
TRAILER PARK
STORE
OFFICE
MACHINE & ERECTING SHOP
TRANSFER PIT
TANK & BOILER SHOP
PLASMA MILL
CRANE REPAIR SHOP
CAR WASH
STATUETTE PAINTING FACILITY
GENERAL GW FLOW DIRECTION
SCALE
0 100 200 300 400 500 600 FEET
KMW-6B
KMW-7A
HCI HYDROLOGIC CONSULTANTS, INC.
SPTCO BAYSHORE FACILITY
TOTAL COPPER CONCENTRATIONS IN SOIL
FIGURE 6.4

OU1 002

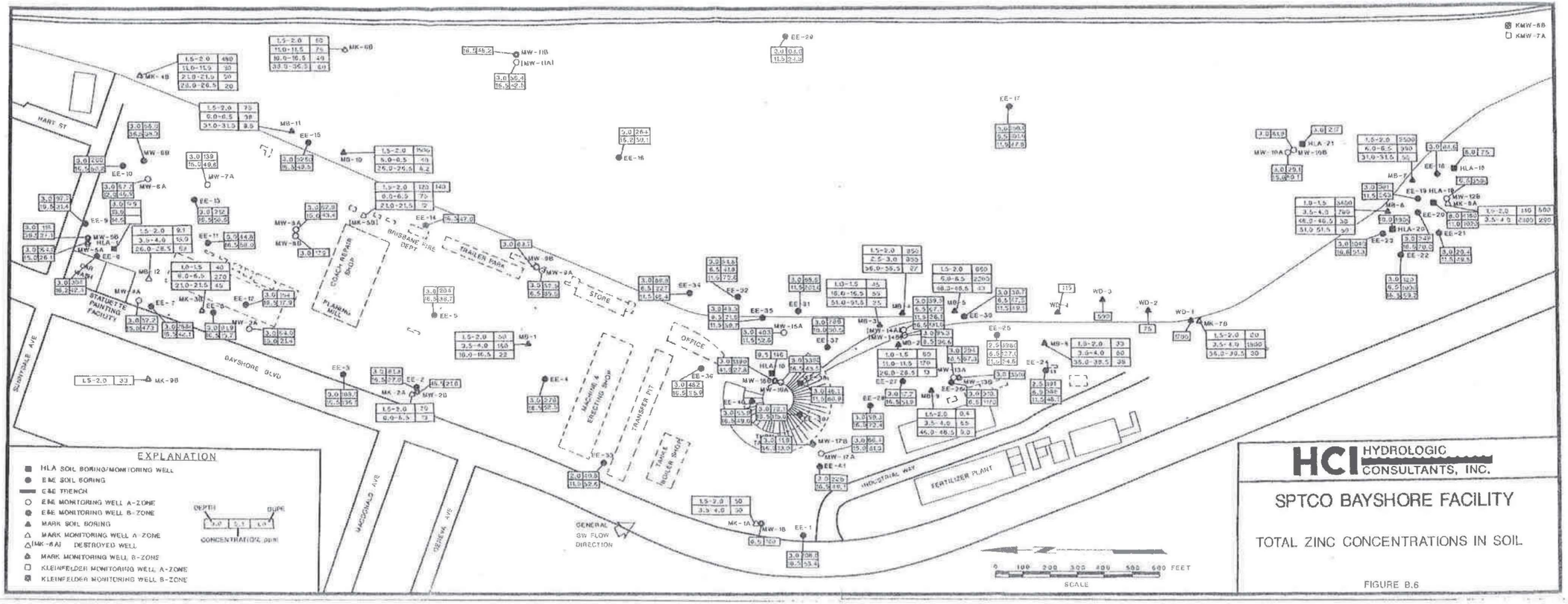


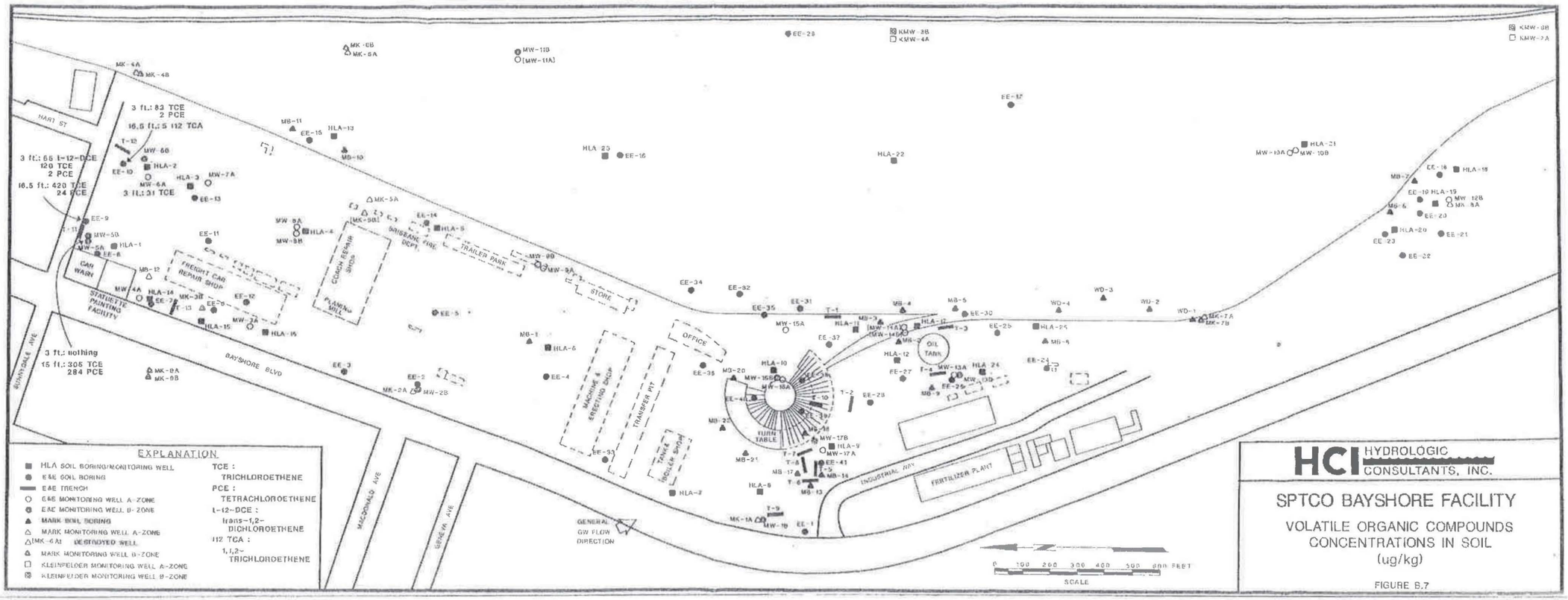
HCI HYDROLOGIC CONSULTANTS, INC.

SPTCO BAYSHORE FACILITY

TOTAL LEAD CONCENTRATIONS IN SOIL

FIGURE B.5


KMW-6B
KMW-7A
HART ST
BAYSHORE BLVD
SUNNYDALE AVE
MACDONALD AVE
DEREMA AVE
BRISBANE FIRE DEPT
COACH REPAIR SHOP
PLANNING UNIT
TRAILER PARK
CAR WASH
STATUETTE PAINTING FACILITY
STORE
OFFICE
MACHINE & ERECTING SHOP
TRANSFER PIT
TRUCK WASHER SHOP
INDUSTRIAL WAY
FERTILIZER PLANT
GENERAL GW FLOW DIRECTION
EXPLANATION
HLA SOIL BORING/MONITORING WELL
E&E SOIL BORING
E&E TRENCH
E&E MONITORING WELL A-ZONE
E&E MONITORING WELL B-ZONE
MARK SOIL BORING
MARK MONITORING WELL A-ZONE
MARK MONITORING WELL B-ZONE
KLEINFELDER MONITORING WELL A-ZONE
KLEINFELDER MONITORING WELL B-ZONE
DEPTH
DUPE
CONCENTRATION, ppm
0 100 200 300 400 500 600 FEET
SCALE
HCI HYDROLOGIC CONSULTANTS, INC.
SPTCO BAYSHORE FACILITY
TOTAL ZINC CONCENTRATIONS IN SOIL
FIGURE B.6

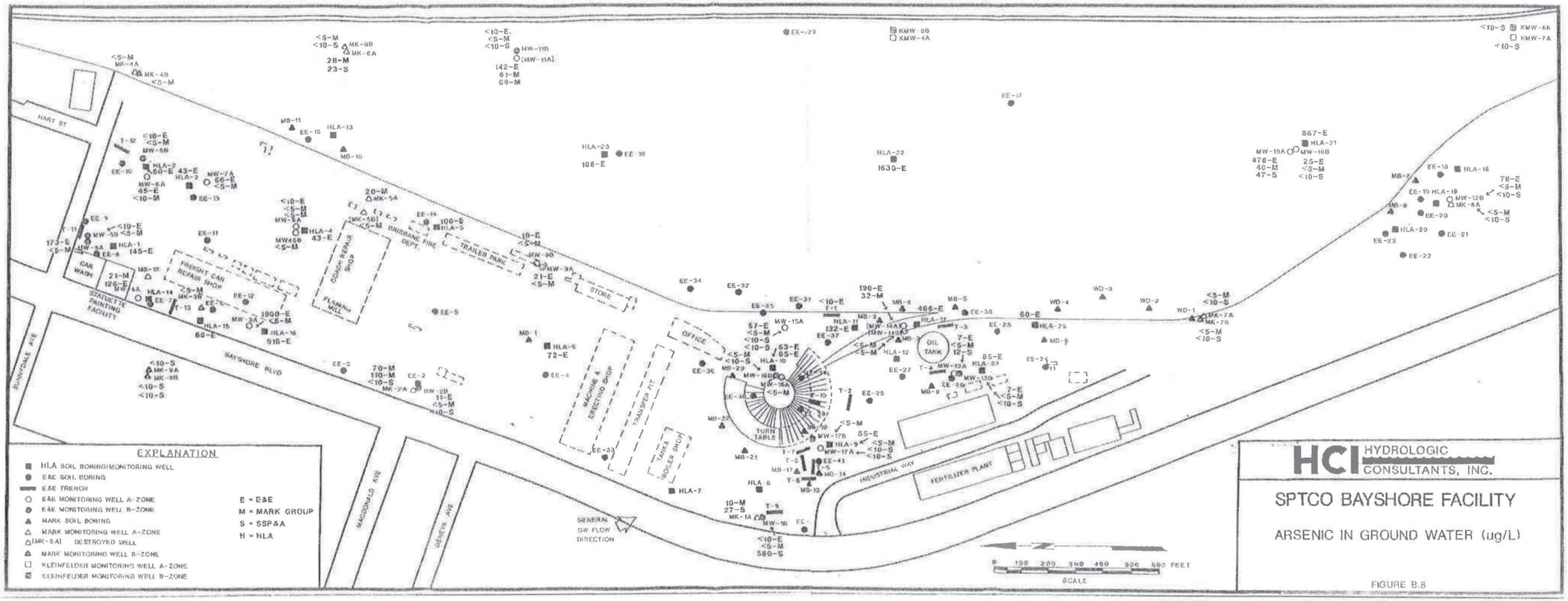


HCI HYDROLOGIC CONSULTANTS, INC.

SPTCO BAYSHORE FACILITY

VOLATILE ORGANIC COMPOUNDS CONCENTRATIONS IN SOIL (ug/kg)

FIGURE B.7

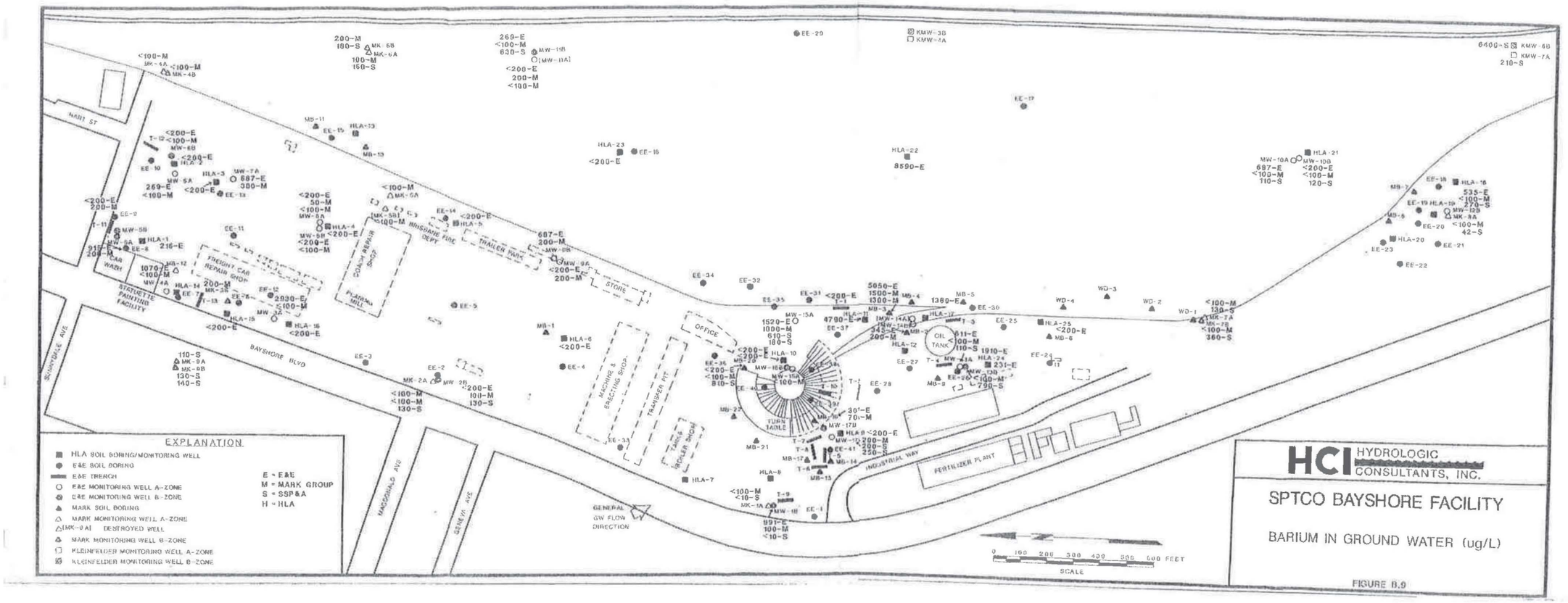


HCI HYDROLOGIC CONSULTANTS, INC.

SPTCO BAYSHORE FACILITY

ARSENIC IN GROUND WATER (ug/L)

FIGURE B.8

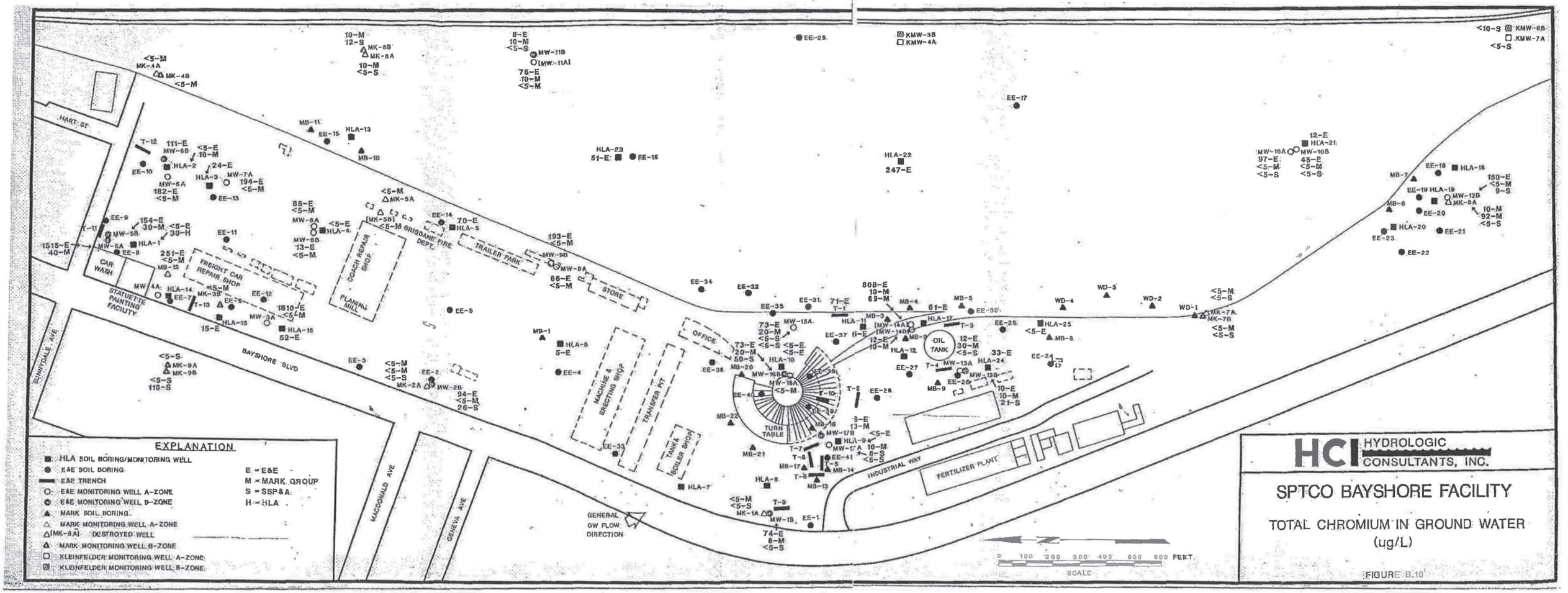


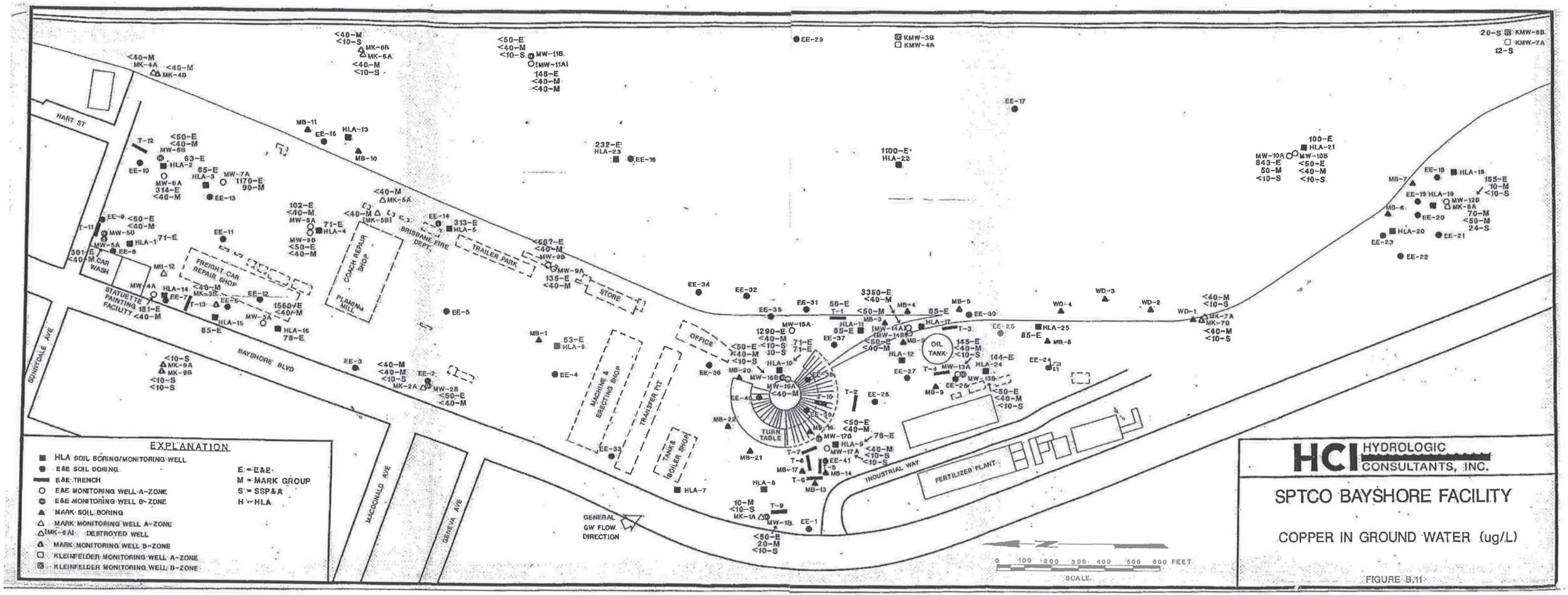
HCI HYDROLOGIC CONSULTANTS, INC.

SPTCO BAYSHORE FACILITY

BARIUM IN GROUND WATER (ug/L)

FIGURE 8.9


HART ST
SUNNYDALE AVE
BAYSHORE BLVD
MACDONALD AVE
GENEVA AVE
CAR WASH
STATUETTE PAINTING FACILITY
FREIGHT CAR REPAIR SHOP
COACH REPAIR SHOP
PLANING MILL
TRAILER PARK
BRISBANE FIRE DEPT.
STORE
OFFICE
MACHINE & ERECTING SHOP
TRANSFER PIT
TANK & BOILER SHOP
TURN TABLE
OIL TANK
INDUSTRIAL WAY
FERTILIZER PLANT
GENERAL GW FLOW DIRECTION
EXPLANATION
HLA SOIL BORING/MONITORING WELL
E&E SOIL BORING
E&E TRENCH
E&E MONITORING WELL A-ZONE
E&E MONITORING WELL B-ZONE
MARK SOIL BORING
MARK MONITORING WELL A-ZONE
(MK-8A) DESTROYED WELL
MARK MONITORING WELL B-ZONE
KLEINFELDER MONITORING WELL A-ZONE
KLEINFELDER MONITORING WELL B-ZONE
E = E&E
M = MARK GROUP
S = SSP&A
H = HLA
0 100 200 300 400 600 800 FEET
SCALE
HCI HYDROLOGIC CONSULTANTS, INC.
SPTCO BAYSHORE FACILITY
TOTAL CHROMIUM IN GROUND WATER (ug/L)
FIGURE B.10

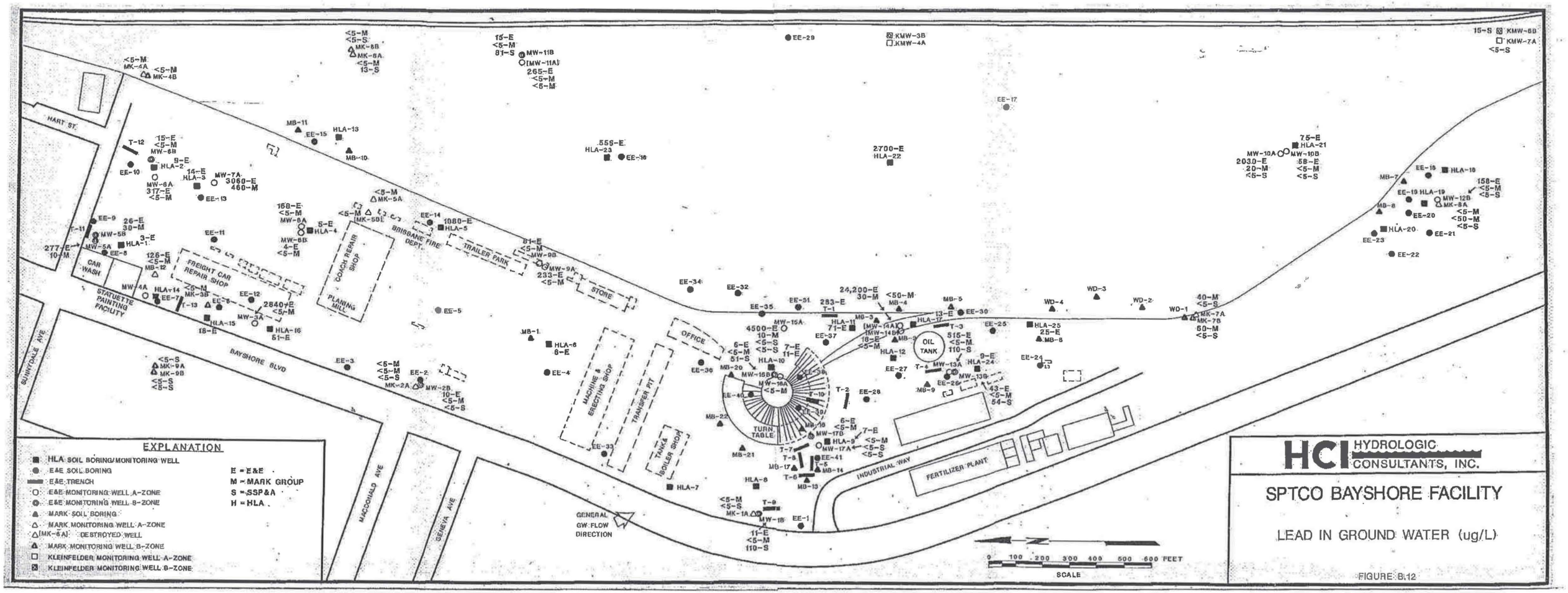


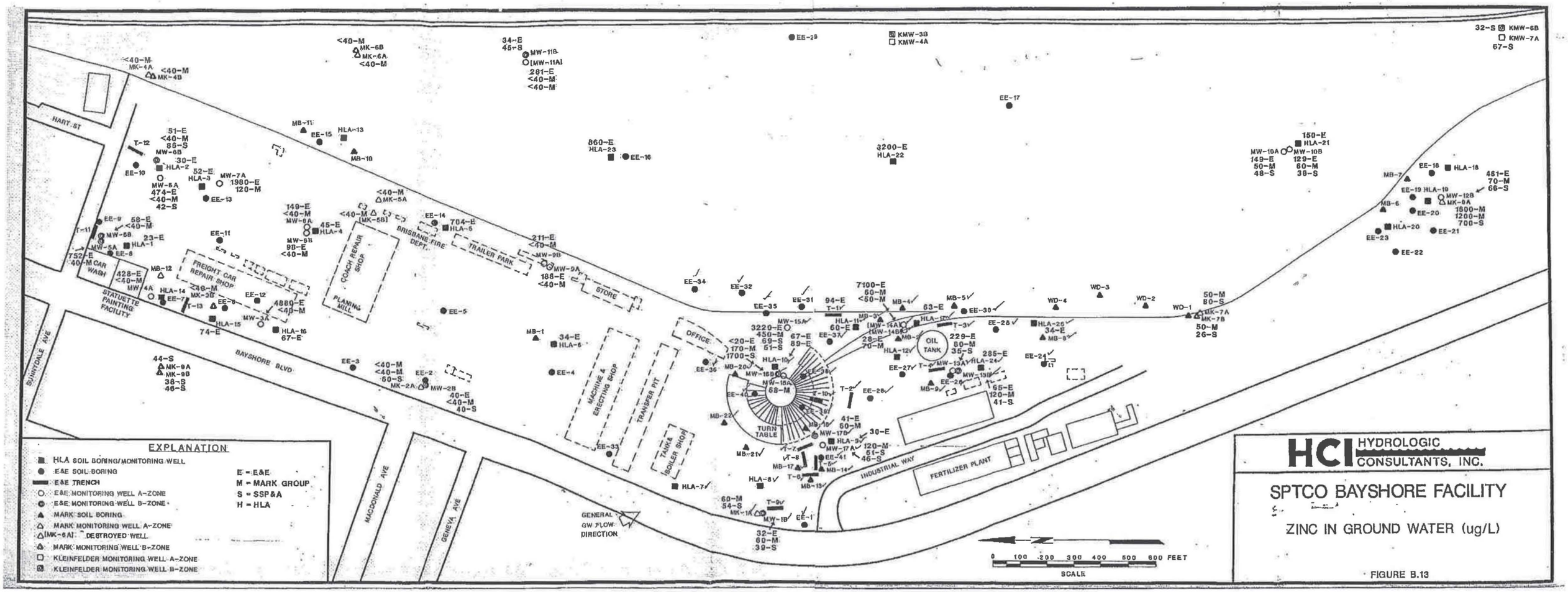
HCI HYDROLOGIC CONSULTANTS, INC.

SPTCO BAYSHORE FACILITY

COPPER IN GROUND WATER (ug/L)

FIGURE B.11


HART ST.
SUNNYDALE AVE.
BAYSHORE BLVD
MACDONALD AVE
GENEVA AVE
CAR WASH
STATUETTE PAINTING FACILITY
FREIGHT CAR REPAIR SHOP
COACH REPAIR SHOP
PLANING MILL
BRISBANE FIRE DEPT.
TRAILER PARK
STORE
OFFICE
MACHINE & ERECTING SHOP
TRANSFER PIT
TANK & BOILER SHOP
TURN TABLE
OIL TANK
FERTILIZER PLANT
INDUSTRIAL WAY
GENERAL GW FLOW DIRECTION
EXPLANATION
HLA SOIL BORING/MONITORING WELL
E&E SOIL BORING
E&E TRENCH
E&E MONITORING WELL A-ZONE
E&E MONITORING WELL B-ZONE
MARK SOIL BORING
MARK MONITORING WELL A-ZONE
[MK-6A] DESTROYED WELL
MARK MONITORING WELL B-ZONE
KLEINFELDER MONITORING WELL A-ZONE
KLEINFELDER MONITORING WELL B-ZONE
E = E&E
M = MARK GROUP
S = SSP&A
H = HLA
0 100 200 300 400 500 600 FEET
SCALE
HCI HYDROLOGIC CONSULTANTS, INC.
SPTCO BAYSHORE FACILITY
LEAD IN GROUND WATER (ug/L)
FIGURE B-12

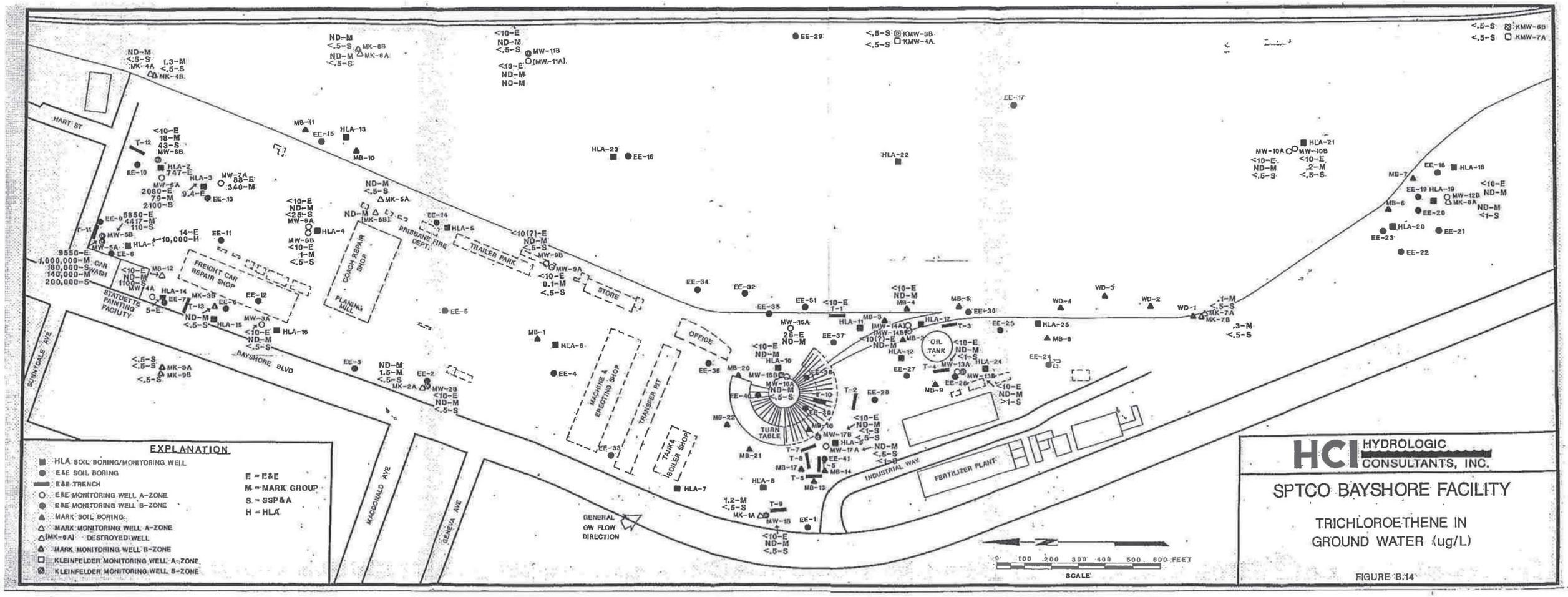


HCI HYDROLOGIC CONSULTANTS, INC.

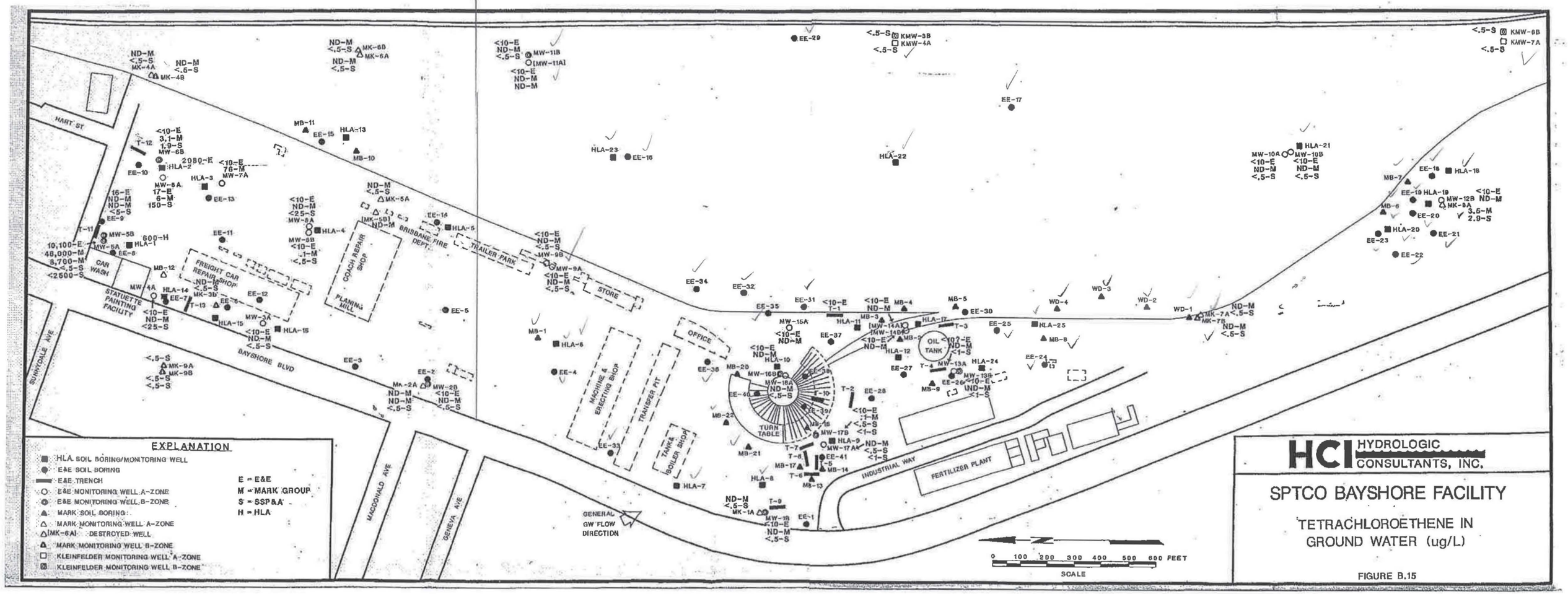
SPTCO BAYSHORE FACILITY

ZINC IN GROUND WATER (ug/L)

FIGURE B.13


HART ST
SUNNYDALE AVE
BAYSHORE BLVD
MACDONALD AVE
GENEVA AVE
INDUSTRIAL WAY
FERTILIZER PLANT
CAR WASH
STATUETTE PAINTING FACILITY
FREIGHT CAR REPAIR SHOP
COACH REPAIR SHOP
PLANING MILL
BRISBANE FIRE DEPT.
TRAILER PARK
STORE
OFFICE
MACHINE & ERECTING SHOP
TRANSFER PIT
TANK & BOILER SHOP
OIL TANK
TURN TABLE
GENERAL GW FLOW DIRECTION
EXPLANATION
HLA SOIL BORING/MONITORING WELL
E&E SOIL BORING
E&E TRENCH
E&E MONITORING WELL A-ZONE
E&E MONITORING WELL B-ZONE
MARK SOIL BORING
MARK MONITORING WELL A-ZONE
(MK-6A) DESTROYED WELL
MARK MONITORING WELL B-ZONE
KLEINFELDER MONITORING WELL A-ZONE
KLEINFELDER MONITORING WELL B-ZONE
E = E&E
M = MARK GROUP
S = SSP&A
H = HLA
0 100 200 300 400 500 600 FEET
SCALE
HCI HYDROLOGIC CONSULTANTS, INC.
SPTCO BAYSHORE FACILITY
TRICHLOROETHENE IN GROUND WATER (ug/L)
FIGURE B-14

OU1 | OU2

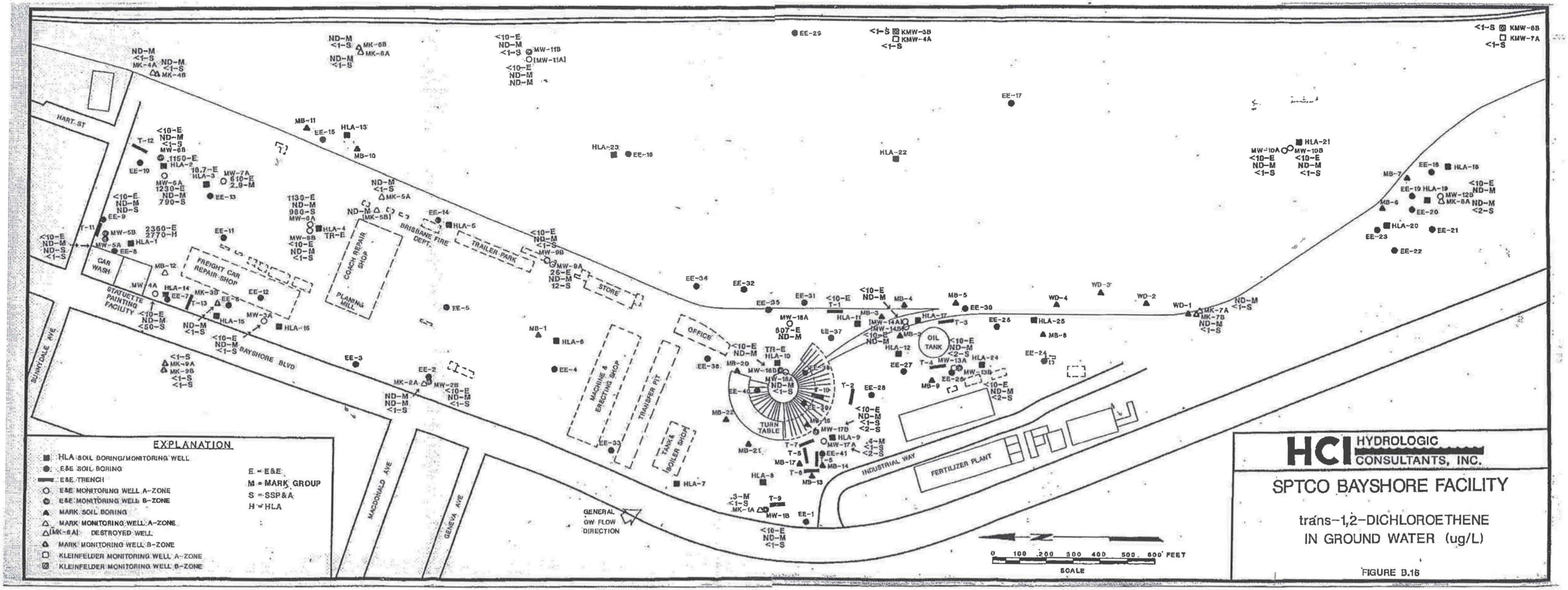


HCI HYDROLOGIC CONSULTANTS, INC.

SPTCO BAYSHORE FACILITY

TETRACHLOROETHENE IN GROUND WATER (ug/L)

FIGURE B.15

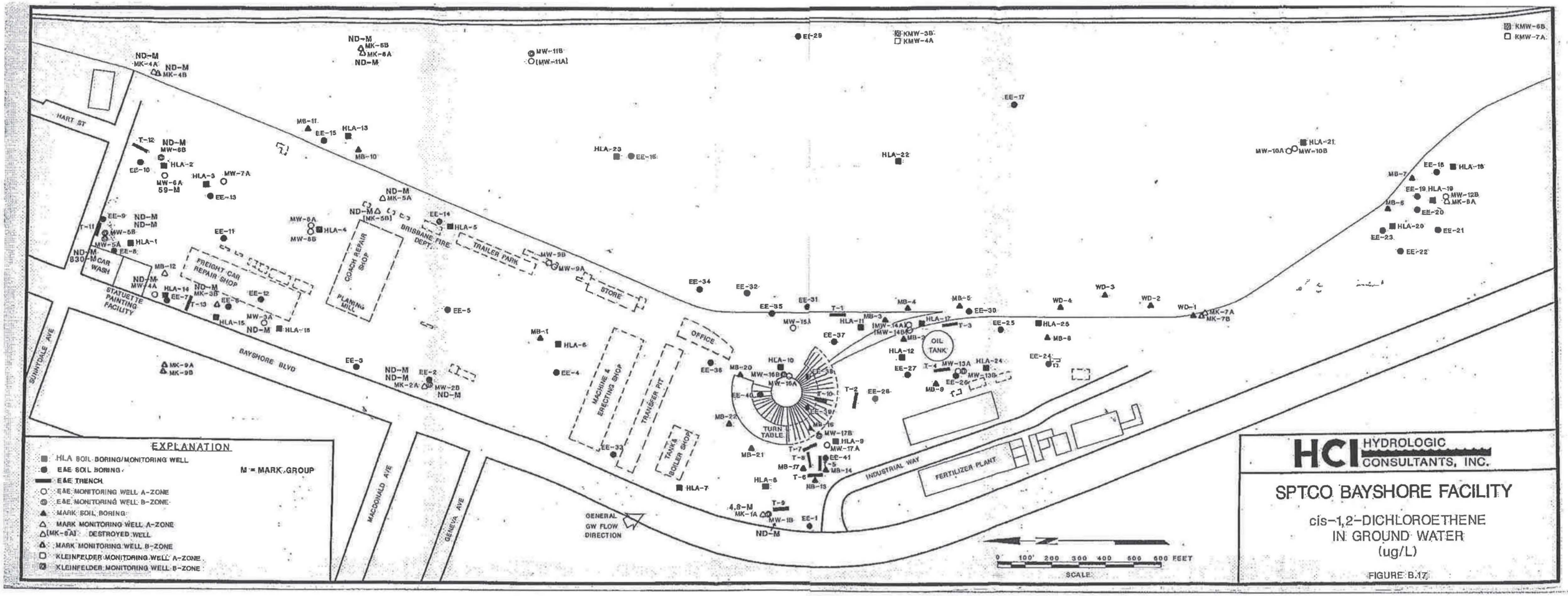


HCI HYDROLOGIC CONSULTANTS, INC.

SPTCO BAYSHORE FACILITY

trans-1,2-DICHLOROETHENE IN GROUND WATER (ug/L)

FIGURE B.16

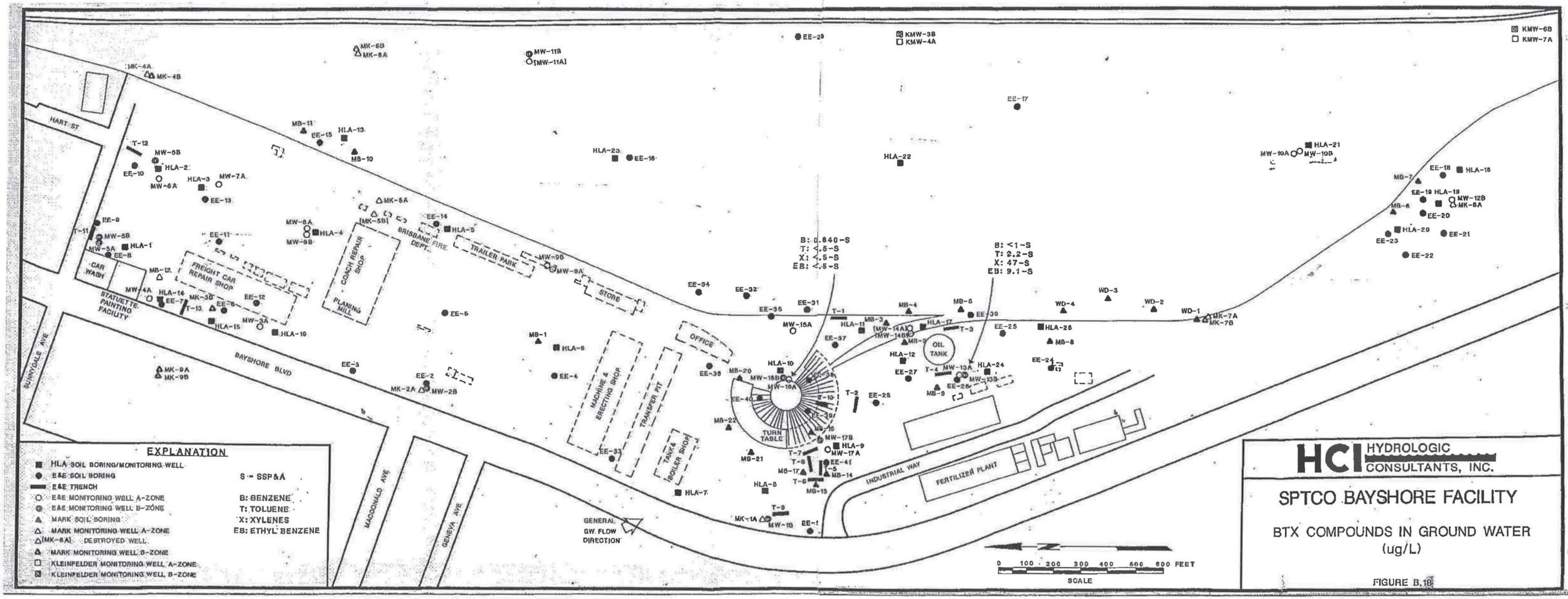


HCI HYDROLOGIC CONSULTANTS, INC.

SPTCO BAYSHORE FACILITY

cis-1,2-DICHLOROETHENE
IN GROUND WATER
(ug/L)

FIGURE B.17


MK-6B
MK-6A
MK-4A
MK-4B
MW-11B
(MW-11A)
EE-29
KMW-3B
KMW-4A
KMW-6B
KMW-7A
EE-17
HART ST
T-12
MW-5B
HLA-2
EE-10
MW-6A
HLA-3
MW-7A
EE-13
MB-11
EE-15
HLA-13
MB-10
HLA-23
EE-16
HLA-22
MW-10A
HLA-21
MW-10B
MB-7
EE-18
HLA-18
EE-19
HLA-19
MW-12B
MK-8A
MB-6
EE-20
HLA-20
EE-21
EE-23
EE-22
EE-9
T-11
MW-5B
MW-5A
HLA-1
EE-8
CAR WASH
MB-12
MW-4A
HLA-14
EE-7
MK-3B
T-13
EE-6
HLA-15
MW-3A
HLA-16
STATUETTE PAINTING FACILITY
FREIGHT CAR REPAIR SHOP
EE-11
MW-8A
MW-8B
HLA-4
MK-5A
(MK-5B)
EE-14
HLA-5
BRISBANE FIRE DEPT.
COACH REPAIR SHOP
PLANING MILL
TRAILER PARK
MW-9B
MW-9A
STORE
EE-5
EE-34
EE-32
EE-35
EE-31
T-1
MB-4
MB-5
EE-30
WD-3
WD-4
WD-2
WD-1
MK-7A
MK-7B
MW-15A
HLA-11
MB-3
(MW-14A)
(MW-14B)
HLA-17
T-3
EE-25
HLA-25
MB-8
EE-37
OIL TANK
HLA-12
EE-27
T-4
MW-13A
HLA-24
MW-13B
EE-26
MB-9
EE-24
T-2
EE-28
MB-1
HLA-6
EE-4
EE-3
EE-2
MK-2A
MW-2B
MK-9A
MK-9B
SUNNYDALE AVE
BAYSHORE BLVD
OFFICE
EE-36
MB-20
HLA-10
MW-15B
MW-16A
EE-40
T-10
EE-39
MB-22
TURN TABLE
MB-16
MW-17B
HLA-9
MW-17A
T-7
T-8
EE-41
EE-5
MB-21
MB-17
MB-14
T-6
MB-13
HLA-8
MACHINE & ERECTING SHOP
TRANSFER PIT
TANK & BOILER SHOP
EE-33
HLA-7
MADDONALD AVE
GENEVA AVE
INDUSTRIAL WAY
FERTILIZER PLANT
T-9
MK-1A
MW-1B
EE-1
GENERAL GW. FLOW DIRECTION
B: 0.840-S
T: <.5-S
X: <.5-S
EB: <.5-S
B: <1-S
T: 2.2-S
X: 47-S
EB: 9.1-S
EXPLANATION
HLA SOIL BORING/MONITORING WELL
EE SOIL BORING
EE TRENCH
EE MONITORING WELL A-ZONE
EE MONITORING WELL B-ZONE
MK SOIL BORING
MK MONITORING WELL A-ZONE
(MK-8A) DESTROYED WELL
MK MONITORING WELL B-ZONE
KLEINFELDER MONITORING WELL A-ZONE
KLEINFELDER MONITORING WELL B-ZONE
S = SSP&A
B: BENZENE
T: TOLUENE
X: XYLENES
EB: ETHYL BENZENE
0 100 200 300 400 500 600 FEET
SCALE
HCI HYDROLOGIC CONSULTANTS, INC.
SPTCO BAYSHORE FACILITY
BTX COMPOUNDS IN GROUND WATER
(ug/L)
FIGURE B.18

STEVE - COPY OF FINAL TEXT & TABLES FOR YOUR FILES. - SCOTT

301

ADDITIONAL SITE CHARACTERIZATION REPORT
FORMER BAYSHORE RAILYARD
BRISBANE, CALIFORNIA

PREPARED FOR:
SUNQUEST PROPERTIES, INC.
150 EXECUTIVE PARK BLVD., STE. 4200
SAN FRANCISCO, CALIFORNIA

DECEMBER 1997

PROJECT NO. 97-221-4

Burns & McDonnell Waste Consultants, Inc.
Engineers-Geologists-Scientists
South San Francisco, California

Table 1

Total Petroleum Hydrocarbon Concentrations in Soil
Former Bayshore Railyard
Brisbane, California

Sample ID	Laboratory ID	Site Area	Date Sampled	Sample Depth (ft bgs)	TPHd (mg/kg)	TPHc (mg/kg)
P-1A-SB-1	130806-17	OTT	09/25/97	2.5 - 3.0	15	58
P-1A-SB-2	130806-18	OTT	09/25/97	5.5 - 6.0	ND < 10	ND < 50
P-1B-SB-1	130326-01	OTT	08/18/97	2.5 - 3.0	ND < 10	ND < 50
P-1B-SB-2	130326-02	OTT	08/18/97	6.0 - 6.5	160	950
P-1C-SB-1	130326-03	OTT	08/18/97	2.5 - 3.0	8,400	36,000
P-1C-SB-3	130326-05	OTT	08/18/97	8.0 - 8.5	560	1,900
P-2B-SB-1	130355-26	OTT	08/20/97	5.5 - 6.0	ND < 10	ND < 50
P-2C-SB-1	130326-06	OTT	08/18/97	5.5 - 6.0	14,000	44,000
P-3A-SB-1	130806-16	OTT	09/25/97	5.0 - 5.5	ND < 10	ND < 50
P-3B-SB-1	130806-15	OTT	09/25/97	5.5 - 6.0	6,600	27,000
P-3C-SB-1	130326-18	OTT	08/19/97	7.0 - 7.5	14,000	46,000
P-3D-SB-1	130326-15	OTT	08/19/97	8.5 - 9.0	13,000	39,000
P-4A-SB-1	130806-27	OTT	09/26/97	6.5 - 7.0	3,900	16,000
P-4B-SB-1	130806-33	OTT	09/26/97	6.0 - 6.5	1,400	5,700
P-4C-SB-1	130326-19	OTT	08/19/97	4.5 - 5.0	1,300	10,000
P-4D-SB-1	130326-16	OTT	08/19/97	5.0 - 5.5	3,500	11,000
P-5A-SB-1	130806-26	OTT	09/25/97	8.0 - 8.5	1,800	7,300
P-5B-SB-1	130326-17	OTT	08/19/97	5.5 - 6.0	24,000	75,000
P-6B-SB-1	130355-28	OTT	08/20/97	7.5 - 8.0	ND < 10	ND < 50
P-6C-SB-1	130326-07	OTT	08/18/97	4.5 - 5.0	41,000	120,000
P-7A-SB-1	130806-25	OTT	09/25/97	7.5 - 8.0	19,000	72,000
P-7B-SB-1	130355-27	OTT	08/20/97	7.0 - 7.5	7,100	25,000
P-7C-SB-1	130326-08	OTT	08/18/97	7.5 - 8.0	27,000	83,000
P-8A-SB-1	130806-23	OTT	09/25/97	3.0 - 3.5	15,000	42,000
P-8A-SB-2	130806-24	OTT	09/25/97	6.5 - 7.0	230	730
P-8B-SB-1	130326-20	OTT	08/19/97	2.5 - 3.0	310	2,900
P-8B-SB-2	130326-21	OTT	08/19/97	5.0 - 5.5	21	130
P-8C-SB-1	130326-09	OTT	08/18/97	2.5 - 3.0	590	5,000
P-8C-SB-2	130326-10	OTT	08/18/97	9.5 - 10.0	10,000	3,300
P-9A-SB-1	130806-19	OTT	09/25/97	3.0 - 3.5	4,100	8,100
P-9A-SB-2	130806-20	OTT	09/25/97	6.0 - 7.0	520	1,100
P-9B-SB-1	130326-11	OTT	08/18/97	2.5 - 3.0	11,000	18,000
P-9B-SB-2	130326-12	OTT	08/18/97	6.0 - 6.5	4,400	15,000
P-9C-SB-1	130326-13	OTT	08/18/97	2.5 - 3.0	380	3,600

TPHd - Total Petroleum Hydrocarbons as diesel using EPA Method 8015 (modified)
TPHc - Total Petroleum Hydrocarbons as Bunker C using EPA Method 8015 (modified)

mg/kg - milligrams per kilogram
ND - Not detected above indicated detection limit
ft bgs - feet below ground surface

OTT - Oil Tank / Turntable Area
SDA - South Disposal Area
UST - Former Underground Storage Tank Area

table1.xls

Table 1 (continued)

Total Petroleum Hydrocarbon Concentrations in Soil
Former Bayshore Railyard
Brisbane, California

Sample ID	Laboratory ID	Site Area	Date Collected	Sample Depth (ft bgs)	TPHd (mg/kg)	TPHc (mg/kg)
P-9C-SB-2	130326-14	OTT	08/18/97	8.0 - 8.5	ND < 10	ND < 50
P-15A-SB-2	130806-31	SDA	09/26/97	5.5 - 6.0	6,100	24,000
P-15B-SB-2	130806-29	SDA	09/26/97	6.0 - 6.5	380	1,800
P-16A-SB-1	130326-22	OTT	08/19/97	2.5 - 3.0	ND < 10	ND < 50
P-16A-SB-2	130326-23	OTT	08/19/97	4.0 - 4.5	240	2,200
P-17A-SB-1	130326-24	OTT	08/19/97	3.5 - 4.0	7,800	13,000
P-18A-SB-1	130355-14	OTT	08/19/97	1.5 - 2.0	2,000	7,200
P-18A-SB-2	130355-15	OTT	08/19/97	5.5 - 6.0	1,300	2,900
P-18B-SB-1	130806-21	OTT	09/25/97	3.0 - 3.5	8,600	16,000
P-18B-SB-2	130806-22	OTT	09/25/97	6.0 - 7.0	3,700	6,800
P-19A-SB-1	130355-24	UST	08/20/97	3.5 - 4.0	30	220
P-19A-SB-2	130355-25	UST	08/20/97	6.0 - 6.5	31	110
P-19B-SB-1	130355-16	UST	08/20/97	3.5 - 4.0	ND < 10	ND < 50
P-19B-SB-2	130355-17	UST	08/20/97	8.5 - 9.0	ND < 10	ND < 50
P-19C-SB-1	130355-18	UST	08/20/97	3.5 - 4.0	20	ND < 50
P-19C-SB-2	130355-19	UST	08/20/97	6.0 - 6.5	710	1,300
P-19D-SB-1	130355-20	UST	08/20/97	3.5 - 4.0	46	1,900
P-19D-SB-2	130355-21	UST	08/20/97	7.0 - 7.5	1,500	2,600
P-19E-SB-1	130355-22	UST	08/20/97	3.5 - 4.0	ND < 10	ND < 50
P-19E-SB-2	130355-23	UST	08/20/97	6.0 - 6.5	980	1,700
P-19G-SB-1	130806-01	UST	09/25/97	3.5 - 4.0	76	190
P-19G-SB-2	130806-02	UST	09/25/97	6.5 - 7.0	190	340
P-19H-SB-1	130806-03	UST	09/25/97	3.5 - 4.0	66	890
P-19H-SB-2	130806-04	UST	09/25/97	7.5 - 8.0	ND < 10	ND < 50
P-19I-SB-1	130806-05	UST	09/25/97	3.5 - 4.0	210	740
P-19I-SB-2	130806-06	UST	09/25/97	5.5 - 6.0	49	86

TPHd - Total Petroleum Hydrocarbons as diesel using EPA Method 8015 (modified)
TPHc - Total Petroleum Hydrocarbons as Bunker C using EPA Method 8015 (modified)

mg/kg - milligrams per kilogram
ND - Not detected above indicated detection limit
ft bgs - feet below ground surface

OTT - Oil Tank / Turntable Area
SDA - South Disposal Area
UST - Former Underground Storage Tank Area

Table 2

Semivolatile Organic Compound Concentrations in Soil
Former Bayshore Railyard
Brisbane, California

Sample ID		P-1C-SB-3	P-3D-SB-1	P-5A-SB-1	P-7A-SB-1	P-9A-SB-1	P-19A-SB-1
Laboratory ID		130326-05	130326-15	130806-26	130806-25	130806-19	130355-24
Date Sampled		8/18/97	8/19/97	9/25/97	9/25/97	9/25/97	8/20/97
Sample Depth (ft bgs)		8.0 - 8.5	6.5 - 7.0	8.0 - 8.5	7.5 - 8.0	3.0 - 3.5	3.5 - 4.0
Site Area		OTT	OTT	OTT	OTT	OTT	UST
Parameter	Units						
Semivolatile Organic Compounds							
2-Methylnaphthalene	µg/kg	ND < 1,700	ND < 33,000	ND < 6,700	ND < 67,000	ND < 3,300	ND < 330
Phenanthrene	µg/kg	2,100	ND < 33,000	ND < 6,700	ND < 67,000	ND < 3,300	ND < 330
Fluoranthene	µg/kg	11,000	ND < 33,000	ND < 6,700	ND < 67,000	ND < 3,300	ND < 330
Pyrene	µg/kg	13,000	ND < 33,000	ND < 6,700	ND < 67,000	ND < 3,300	680
Benzo (a) anthracene	µg/kg	3,800	ND < 33,000	ND < 6,700	ND < 67,000	ND < 3,300	ND < 330
Chrysene	µg/kg	4,600	ND < 33,000	ND < 6,700	ND < 67,000	ND < 3,300	440
Benzo (b) fluoranthene	µg/kg	5,100	ND < 33,000	ND < 6,700	ND < 67,000	ND < 3,300	340
Benzo (k) fluoranthene	µg/kg	5,200	ND < 33,000	ND < 6,700	ND < 67,000	ND < 3,300	470
Benzo (a) pyrene	µg/kg	6,500	ND < 33,000	ND < 6,700	ND < 67,000	ND < 3,300	560
Indeno (1,2,3-cd) pyrene	µg/kg	3,700	ND < 33,000	ND < 6,700	ND < 67,000	ND < 3,300	ND < 330
Benzo (g,h,i) perylene	µg/kg	4,400	ND < 33,000	ND < 6,700	ND < 67,000	ND < 3,300	360

Semivolatile organic compounds analyzed using EPA Method 8270
ft bgs - feet below ground surface
µg/kg - micrograms per kilogram
ND - Not detected above indicated detection limit
OTT - Oil Tank / Turntable Area
UST - Former Underground Storage Tank Area
Please refer to the laboratory reports for dilution factors.

Table 3

Metal Concentrations in Soil
Former Bayshore Railyard
Brisbane, California

Sample ID	P-10A-SB-1	P-10A-SB-2	P-10B-SB-1	P-10C-SB-1	P-10C-SB-2	P-10D-SB-1	P-10E-SB-1
Laboratory ID	130806-12	130806-13	130806-11	130355-04	130355-05	130355-29	130355-06
Date	09/25/97	09/25/97	09/25/97	08/21/97	08/21/97	08/21/97	08/21/97
Sample Depth	0.5 - 1.0	5.5 - 6.0	5.5 - 6.0	0.25 - 0.75	5.5 - 6.0	5.5 - 6.0	0.25 - 0.75
Antimony	ND < 2.9	ND < 3.0	ND < 2.9	13	ND < 3.0	ND < 2.9	ND < 3.0
Arsenic	0.77	5.6	23	20	13	16	15
Barium	22	58	60	190	34	21	150
Beryllium	0.66	0.58	0.82	0.2	0.14	0.94	0.17
Cadmium	1.4	1.2	2.2	8.5	0.34	0.82	4.3
Total Chromium	10	9.9	25	76	19	22	71
Cobalt	7.8	7.4	14	47	4.4	12	10
Copper	76	52	36	610	16	26	220
Lead	5	1.6	20	900	44	40	250
Mercury	ND < 0.077	0.091	0.16	3	0.1	0.18	0.41
Molybdenum	2.4	1	ND < 0.95	15	ND < 1.0	ND < 0.97	5.4
Nickel	2.7	8.8	27	150	24	27	49
Selenium	0.35	ND < 0.25	ND < 0.24	1.1	ND < 0.24	ND < 0.24	0.46
Silver	ND < 0.48	ND < 0.50	ND < 0.48	1.5	ND < 0.50	ND < 0.48	0.77
Thallium	ND < 0.24	.25 U	ND < 0.24	ND < 0.25	ND < 0.25	ND < 0.24	ND < 0.25
Vanadium	69	51	34	34	14	29	37
Zinc	26	24	69	1,800	86	75	460

Sample ID	P-10E-SB-3	P-11C-SB-1	P-11C-SB-2	P-11D-SB-1	P-11E-SB-1	P-11E-SB-2	P-12A-SB-1
Laboratory ID	130355-07	130355-08	130355-09	130355-10	130355-11	130355-12	130806-07
Date	08/21/97	08/21/97	08/21/97	08/21/97	08/21/97	08/21/97	09/25/97
Sample Depth	5.5 - 6.0	0.25 - 0.75	6.0 - 6.5	6.5 - 7.0	0.25 - 0.75	4.5 - 5.0	0.5 - 1.0
Antimony	ND < 2.9	ND < 2.9	ND < 3.0	ND < 2.9	ND < 3.0	ND < 2.8	16
Arsenic	7.8	14	21	23	9.1	18	19
Barium	39	63	43	170	84	47	890
Beryllium	0.5	0.12	ND < 0.10	0.51	0.15	0.77	0.65
Cadmium	0.51	1.2	0.45	0.31	1.4	0.7	10
Total Chromium	24	18	6.3	16	25	26	69
Cobalt	9.5	4.8	9.3	8.3	7.4	17	13
Copper	19	100	110	6.6	250	51	880
Lead	15	170	0.45	9.4	200	31	1,900
Mercury	ND < 0.091	0.44	ND < 0.10	0.14	0.27	0.14	0.75
Molybdenum	ND < 0.98	1.5	ND < 1.0	ND < 0.96	2.2	ND < 0.95	3.6
Nickel	25	20	4	29	38	41	58
Selenium	ND < 0.24	ND < 0.24	ND < 0.25	ND < 0.24	0.77	0.29	0.46
Silver	ND < 0.49	ND < 0.49	ND < 0.50	ND < 0.48	ND < 0.50	ND < 0.47	3.7
Thallium	ND < 0.24	ND < 0.24	ND < 0.25	ND < 0.24	ND < 0.25	ND < 0.24	ND < 0.25
Vanadium	33	27	54	19	30	37	33
Zinc	250	200	29	32	220	140	4,000

Metals analyzed using 6000/7000 series of EPA Methods
ND - Not detected above indicated detection limit
All concentrations are in units of milligrams per kilogram (mg/kg)
Sample Depths are in units of feet below ground surface (ft bgs)
All samples collected from the South Disposal Area

table3.xls

Table 3 (continued)

Metal Concentrations in Soil
Former Bayshore Railyard
Brisbane, California

Sample ID	P-12A-SB-2	P-12B-SB-1	P-13A-SB-1	P-13B-SB-1	P-13B-SB-3	P-14A-SB-1	P-14B-SB-1
Laboratory ID	130806-08	130355-13	130806-32	130379-01	130379-02	130806-34	130379-03
Date Sampled	09/25/97	08/21/97	09/26/97	08/20/97	08/20/97	09/25/97	08/20/97
Sample Depth	5.5 - 6.0	9.5 - 10.0	6.0 - 6.5	7.0 - 7.5	9.5 - 10.0	6.5 - 7.0	5.5 - 6.0
Antimony	14	ND < 3.0	ND < 2.9	4.6	51	11	23
Arsenic	54	5	3.3	19	25	7.6	18
Barium	990	22	36	220	2,100	1,200	2,100
Beryllium	0.38	0.44	0.73	0.56	0.59	0.79	0.85
Cadmium	17	0.46	2	6.2	8.7	3.8	8.2
Total Chromium	54	19	30	79	73	25	380
Cobalt	23	7.3	9.7	18	11	5.2	7.9
Copper	1,100	12	11	220	3,400	690	1,500
Lead	11,000	6	3.9	460	6,000	3,600	7,500
Mercury	0.13	ND < 0.10	ND < 0.091	ND < 0.10	ND < 0.095	1	0.14
Molybdenum	2.9	ND < 0.99	ND < 0.96	2.6	1.9	ND < 0.98	1.2
Nickel	100	20	35	92	38	38	48
Selenium	ND < 0.24	ND < 0.25	0.64	0.32	ND < 0.24	0.61	ND < 0.25
Silver	4.4	ND < 0.49	ND < 0.48	0.63	9	8	8
Thallium	ND < 0.24	ND < 0.25	ND < 0.24	ND < 0.24	ND < 0.24	ND < 0.25	ND < 0.25
Vanadium	78	30	45	70	37	20	38
Zinc	2,900	44	32	5,900	4,600	1,900	4,700

Sample ID	P-14B-SB-2	P-15A-SB-1	P-15A-SB-2	P-15B-SB-1	P-15B-SB-2	P-15C-SB-1	P-15C-SB-3
Laboratory ID	130379-04	130806-30	130806-31	130806-28	130806-29	130355-02	130355-03
Date Sampled	08/20/97	09/26/97	09/26/97	09/26/97	09/26/97	08/21/97	08/21/97
Sample Depth	8.0 - 8.5	0.5 - 1.0	5.5 - 6.0	0.5 - 1.0	6.0 - 6.5	0.25 - 0.75	6.0 - 6.5
Antimony	17	ND < 2.9	ND < 2.9	ND < 3.0	ND < 3.0	ND < 2.9	ND < 2.9
Arsenic	37	12	9.9	0.85	21	19	8.9
Barium	1,300	48	27	13	42	140	18
Beryllium	0.5	0.32	0.79	0.76	0.82	0.17	0.38
Cadmium	14	1.4	1.6	1.8	2.2	0.73	0.63
Total Chromium	60	20	25	5.5	28	19	19
Cobalt	17	7.5	13	10	10	9.9	8.9
Copper	3,100	77	32	49	40	210	20
Lead	4,900	59	14	1.3	11	290	6
Mercury	2.2	0.19	ND < 0.074	ND < 0.071	ND < 0.091	0.39	0.1
Molybdenum	2.1	ND < 0.96	ND < 0.98	ND < 1	ND < 0.99	1.5	ND < 0.96
Nickel	58	36	30	3.5	29	16	20
Selenium	ND < 0.24	0.65	0.28	ND < 0.25	0.58	1.3	0.27
Silver	5.9	ND < 0.48	ND < 0.49	ND < 0.50	ND < 0.50	ND < 0.49	ND < 0.48
Thallium	ND < 0.24	ND < 0.24	ND < 0.25	ND < 0.25	ND < 0.25	ND < 0.24	ND < 0.24
Vanadium	41	26	31	77	37	66	30
Zinc	7,200	49	71	33	66	570	53

Metals analyzed using 6000/7000 series of EPA Methods
ND - Not detected above indicated detection limit
All concentrations are in units of milligrams per kilogram (mg/kg)
Sample Depths are in units of feet below ground surface (ft bgs)
All samples collected from the South Disposal Area

table3.xls

Table 3 (continued)

Metal Concentrations in Soil
Former Bayshore Railyard
Brisbane, California

Sample ID	P-15D-SB-1	P-20A-SB-1	P-21A-SB-1	P-21A-SB-2
Laboratory ID	130355-01	130806-14	130806-09	130806-10
Date Sampled	08/21/97	09/25/97	09/25/97	09/25/97
Sample Depth	5.0 - 5.5	5.5 - 6.0	0.5 - 1.0	3.5 - 4.0
Antimony	ND < 3	ND < 2.9	ND < 2.9	59
Arsenic	7.5	5.3	2.3	45
Barium	42	47	55	6,600
Beryllium	0.67	0.56	0.31	0.45
Cadmium	0.78	1.8	1	23
Total Chromium	20	20	25	140
Cobalt	18	7.3	5.5	13
Copper	39	50	15	18,000
Lead	17	61	12	13,000
Mercury	ND < 0.083	ND < 0.074	ND < 0.10	0.91
Molybdenum	ND < 0.99	ND < 0.95	ND < 0.95	2.7
Nickel	34	23	33	150
Selenium	ND < 0.25	0.78	ND < 0.24	2.8
Silver	ND < 0.49	ND < 0.48	ND < 0.48	40
Thallium	ND < 0.25	ND < 0.24	ND < 0.24	ND < 0.25
Vanadium	31	26	19	23
Zinc	80	78	25	17,000

Metals analyzed using 6000/7000 series of EPA Methods
ND - Not detected above indicated detection limit
All concentrations are in units of milligrams per kilogram (mg/kg)
Sample Depths are in units of feet below ground surface (ft bgs)
All samples collected from the South Disposal Area

Table 6

Total Petroleum Hydrocarbon Concentrations in Groundwater
Former Bayshore Railyard
Brisbane, California

Sample ID	Laboratory ID	Site Area	Date Sampled	TPHd (µg/L)	TPHc (µg/L)
P-1A	130863-08	OTT	10/01/97	2,100	6,500
P-1B	130379-08	OTT	08/22/97	1,600	3,800
P-1B DUP	130379-09	OTT	08/22/97	1,300	3,200
P-2C	130379-12	OTT	08/22/97	28,000	71,000
P-3A	130863-07	OTT	10/01/97	450	2,000
P-3D	130379-13	OTT	08/22/97	270,000	940,000
P-4A	130863-06	OTT	10/01/97	18,000	75,000
P-4D	130394-08	OTT	08/25/97	46,000	7,000
P-5A	130864-02	OTT	10/02/97	30,000	130,000
P-6C	130394-10	OTT	08/25/97	27,000	6,800
P-7A	130864-03	OTT	10/02/97	2,700,000	11,000,000
P-7C	130394-09	OTT	08/25/97	22,000	12,000
P-8A	130863-09	OTT	10/01/97	26,000	71,000
P-8C	130379-11	OTT	08/22/97	150,000	470,000
P-9A	130864-06	OTT	10/02/97	15,000	31,000
P-9C	130379-10	OTT	08/22/97	3,000	6,600
P-16	130379-07	OTT	08/22/97	5,300	6,500
P-17	130379-06	OTT	08/22/97	73,000	140,000
P-18	130379-05	OTT	08/22/97	83,000	230,000
P-18B	130864-07	OTT	10/02/97	51,000	97,000
P-15A	130863-05	SDA	10/01/97	10,000	43,000
P-19A	130394-06	UST	08/25/97	1,300	3,100
P-19C	130394-05	UST	08/25/97	1,400	3,600
P-19E	130394-07	UST	08/25/97	1,600	4,300
P-19G	130864-04	UST	10/02/97	4,300	12,000
P-19I	130864-05	UST	10/02/97	4,200	9,100

TPHd - Total Petroleum Hydrocarbons as Diesel analyzed using EPA Method 8015 (modified)
TPHc - Total Petroelum Hydrocarbons as Bunker C analyzed using EPA Method 8015 (modified)
µg/L - micrograms per liter
OTT - Oil Tank / Turntable Area
SDA - South Disposal Area
UST - Underground Storage Tank Area

Table 7

Semivolatile Organic Compound Concentrations in Groundwater
Former Bayshore Railyard
Brisbane, California

Sample ID	Laboratory ID	Site Area	Date Sampled	Phenol (µg/L)	Naphthalene (µg/L)	Phenanthrene (µg/L)
P-1B	130379-08	OTT	08/22/97	ND < 9.7	ND < 9.7	ND < 9.7
P-3D	130379-13	OTT	08/22/97	ND < 1,000	ND < 1,000	590
P-5A	130864-02	OTT	10/02/97	37	ND < 48	ND < 48
P-7C	130394-09	OTT	08/25/97	ND < 48	51	ND < 48
P-9A	130864-06	OTT	10/02/97	ND < 9.4	ND < 9.4	ND < 9.4
P-19A	130394-06	UST	08/25/97	ND < 9.4	ND < 9.4	ND < 9.4

Semivolatile organic compounds analyzed using EPA Method 8270
µg/L - micrograms per liter
ND - Not detected above indicated detection limit
OTT - Oil Tank / Turntable Area
UST - Underground Storage Tank Area

Table 8

Metal Concentrations in Groundwater
Former Bayshore Railyard
Brisbane, California

Sample ID	P-10A	P-10A	P-10E	P-10E	P-11E	P-11E
Laboratory ID	130863-02	130863-02	130394-03	130394-03	130394-02	130394-02
Date Sampled	10/01/97	10/01/97	08/25/97	08/26/97	08/25/97	08/26/97
Filtered/Unfiltered	Unfiltered	Filtered	Unfiltered	Filtered	Unfiltered	Filtered
Antimony	ND < 60	ND < 60	ND < 60	ND < 60	ND < 60	ND < 60
Arsenic	380	98	15	10	130	45
Barium	680	270	360	250	900	150
Beryllium	5	ND < 2	ND < 2	ND < 2	ND < 2	ND < 2
Cadmium	13	ND < 5	5.8	ND < 5	ND < 5	ND < 5
Total Chromium	91	ND < 10	32	ND < 10	71	ND < 10
Cobalt	77	ND < 20	ND < 20	ND < 20	29	ND < 20
Copper	650	18	210	56	450	45
Lead	110	ND < 3	410	6.8	710	ND < 3
Mercury	0.52	ND < 0.20	0.42	ND < 0.20	0.69	ND < 0.20
Molybdenum	ND < 20	ND < 20	ND < 20	ND < 20	ND < 20	ND < 20
Nickel	100	ND < 20	38	ND < 20	110	ND < 20
Selenium	6.9	9.2	ND < 5	ND < 5	ND < 5	ND < 5
Silver	ND < 5	ND < 5	ND < 5	ND < 5	ND < 5	ND < 5
Thallium	ND < 5	ND < 5	ND < 5	ND < 5	ND < 5	ND < 5
Vanadium	460	ND < 10	23	ND < 10	83	ND < 10
Zinc	390	20 U	1,200	540	900	35

Sample ID	P-12B	P-13A	P-13A	P-14A	P-14A	P-15A
Laboratory ID	130394-01	130863-03	130864-01	130863-04	130966-01	130863-05
Date Sampled	08/25/97	10/01/97	10/02/97	10/01/97	10/09/97	10/01/97
Filtered/Unfiltered	Unfiltered	Unfiltered	Filtered	Unfiltered	Filtered	Unfiltered
Antimony	79	ND < 60	ND < 60	300	ND < 60	ND < 60
Arsenic	83	220	ND 5	98	9.9	450
Barium	3,500	3,400	52	4,500	67	1,500
Beryllium	4.4	31	ND < 2	8.3	ND < 2	9.1
Cadmium	18	72	ND < 5	32	ND < 5	32
Total Chromium	370	3,400	ND < 10	4,000	ND < 10	470
Cobalt	98	360	ND < 20	81	ND < 20	160
Copper	1,700	850	14	4,500	200	1,400
Lead	4,500	300	ND < 3	12,000	35	1,500
Mercury	1.7	0.56	ND < 0.20	9.3	ND < 0.20	1.4
Molybdenum	34	34	ND < 20	ND < 20	ND < 20	34
Nickel	300	1,200	33	610	29	480
Selenium	ND < 5	ND < 5	ND < 5	7.9	5.9	ND < 5
Silver	12	ND < 5	ND < 5	24	ND < 5	ND < 5
Thallium	ND < 5	ND < 5	ND < 5	ND < 5	ND < 5	ND < 5
Vanadium	350	1,500	ND < 10	380	ND < 10	580
Zinc	5,400	1,800	24	10,000	790	1,800

Metals analyzed using the 6000/7000 series of EPA Methods
ND - Not Detected above indicated detection limit
All concentrations are in units of micrograms per liter (µg/L)
All samples collected from the South Disposal Area

Table 8 (continued)

Metal Concentrations in Groundwater
Former Bayshore Railyard
Brisbane, California

Sample ID	P-15A	P-15C	P-21A	P-21A
Laboratory ID	130863-05	130394-04	130863-01	130863-01
Date Sampled	10/01/97	08/25/97	10/01/97	10/01/97
Filtered/Unfiltered	Filtered	Unfiltered	Unfiltered	Filtered
Antimony	ND < 60	ND < 60	110	ND < 60
Arsenic	13	25	50	18
Barium	220	270	2,600	220
Beryllium	ND < 2	ND < 2	ND < 2	ND < 2
Cadmium	ND < 5	ND < 5	15	ND < 5
Total Chromium	ND < 10	65	140	ND < 10
Cobalt	ND < 20	23	26	ND < 20
Copper	ND < 10	200	1,800	110
Lead	ND < 3	230	5,500	12
Mercury	ND < 0.20	0.3	4.9	ND < 0.20
Molybdenum	ND < 20	ND < 20	ND < 20	ND < 20
Nickel	ND < 20	70	130	ND < 20
Selenium	ND < 5	ND < 5	5.4	8.1
Silver	ND < 5	ND < 5	14	ND < 5
Thallium	ND < 5	ND < 5	ND < 5	ND < 5
Vanadium	ND < 10	91	85	ND < 10
Zinc	ND < 20	440	5,100	220

Metals analyzed using the 6000/7000 series of EPA Methods
ND - Not Detected above indicated detection limit
All concentrations are in units of micrograms per liter (µg/L)
All samples collected from the South Disposal Area

CALTRAIN RAILROAD TRACKS

ABANDONED RAILROAD TRACKS

FORMER UST AREA

P-19B P-19A P-19I P-19E P-19G P-19C P-19D P-19H KMW-4A KMW-3B

KMW-6B KMW-7A

P-10A P-10B P-11C P-10C MW-10A MW-10B P-11D P-10D P-21A P-11E P-20A P-10E

FORMER METALS DISPOSAL AREA

36" EUC 24" EUC 24" EUC 20" EUC STORM DRAIN JUNCTION BOX P-12B

SDP-3 MK-12B MK-8A P-12A

E (OH) TP-2

DRAINAGE DITCH 12" SD

P-3A P-3B P-4A P-15C P-13B P-13A

SDP-1 P-15D AC ROADWAY SDP-2 EXISTING DRAINAGE CHANNEL

P-1A P-2B LF-5A LF-5B P-3C AC ROADWAY P-4B P-15B LF-7A

P-16A AC ROADWAY P-1B P-1C P-2C P-4C P-14B

LF-6B MW-15A LF-4A LF-4B EXISTING DRAINAGE CHANNEL P-3D P-4D P-15A MK-7A MK-7B P-14A

P-9B MW-14A FORMER OIL TANK (APPROXIMATE)

P-17A P-9A P-9C P-5B LF-8B LF-8A 6' CHAIN LINK FENCE

MW-16B P-7C MW-13A P-6C MW-13B P-5A

TURNTABLE P-8B P-6B P-8A P-7B

ROUNDHOUSE P-7A

MW-17A MW-17B P-18B

INDUSTRIAL WAY

P-18A

LEGEND

- GEOPROBE LOCATION
- MONITORING WELL LOCATION
- OVERHEAD ELECTRIC LINE POWER POLE/ LIGHT POLE
- 12" SD 12-INCH DIAMETER STORM DRAIN
- CHAIN LINK FENCE
- EUCALYPTUS TREE

100' 0' 100' 200'
SCALE IN FEET

Burns & McDonnell Waste Consultants Inc.

Figure 2

SITE PLAN
FORMER BAYSHORE RAILYARD
BRISBANE, CALIFORNIA

K:\EQUIP\ACAD\SUN\MW136X24.DGN
K:\EQUIP\ACAD\SUN\MW&ENCMP.DGN
SUN0001.DGN/27-OCT-97 13:56/CLW

CALTRAIN RAILROAD TRACKS

P-19B
P-19E P-19C
P-19I P-19G KMW-4A
P-19D P-19A KMW-3B
P-19H
PYRENE-680
CHRYSENE-440
BENZO (b) FLOURANTHENE-340
BENZO (k) FLOURANTHENE-470
BENZO (a) PYRENE-560
BENZO (g,h,i) PERYLENE
(3.5-4.0)

FORMER UST AREA

KMW-6B KMW-7A

P-10A
P-10B
P-11C
ABANDONED RAILROAD TRACKS
P-10C MW-10A MW-10B
P-11D
36" EUC
24" EUC
24" EUC
20" EUC
20" EUC
STORM DRAIN JUNCTION BOX
P-12B
P-10D
P-21A
P-11E
P-20A
P-10E
FORMER METALS DISPOSAL AREA
SDP-3
MK-12B
MK-8A
P-12A
E (OH)
TP-2
P-1C
PHENANTHRENE-2,100
FLOURANTHENE-11,000
PYRENE-13,000
BENZO (a) ANTHRACENE-3,800
CHRYSENE-4,600
BENZO (b) FLOURANTHENE-5,100
BENZO(k) FLOURANTHENE-5,200
BENZO (a) PYRENE-6,500
INDENO (1,2,3-cd) PYRENE-3,700
BENZO (g,h,i) PERYLENE-4,400
(8.0-8.5)
DRAINAGE DITCH
P-3A
SDP-1
P-15D
AC ROADWAY
SDP-2
P-15C
P-13B
P-1A
P-2B
LF-5A
LF-5B
P-3B
P-4A
P-1B
P-16A
P-2C
12" SD
AC ROADWAY
P-4B
P-15B
LF-7A
EXISTING DRAINAGE CHANNEL
P-13A
P-3C
P-4C
P-15A
P-14B
LF-6B MW-15A
LF-4A LF-4B
EXISTING DRAINAGE CHANNEL
P-3D
ND
(6.5-7.0)
P-4D
MK-7B
MK-7A
P-14A
MW-14A
P-9B
P-9A
ND
(3.0-3.5)
FORMER OIL TANK (APPROXIMATE)
P-9C
P-17A
P-5B
LF-8B
LF-8A
6' CHAIN LINK FENCE
MW-16B
P-7C
MW-13A
P-6C
P-8C
MW-13B
P-6B
P-5A
ND
(8.0-8.5)
TURNTABLE
P-8B
P-8A
P-7B
ROUNDHOUSE
P-7A
2-METHYLNAPHTHALENE-54,000
(7.5-8.0)
MW-17A
MW-17B
P-18B
INDUSTRIAL WAY
P-18A

LEGEND

- ⊙ GEOPROBE LOCATION
- ✧ MONITORING WELL LOCATION
- PYRENE-680 SEMIVOLATILE ORGANIC COMPOUND CONCENTRATIONS (IN MICROGRAMS PER KILOGRAM)
- (3.0-3.5) SAMPLE DEPTH (IN FEET BELOW GROUND SURFACE)
- ND NOT DETECTED

100' 0' 100' 200'
SCALE IN FEET

Figure 4
SEMIVOLATILE ORAGANIC COMPOUND CONCENTRATIONS IN SOIL
FORMER BAYSHORE RAILYARD
BRISBANE, CALIFORNIA

Harris & McDonnell Waste Consultants Inc.

K:\eurquast\austin\sec136x24.dgn
K:\eurquast\austin\eurohmap.dgn
SUN0003.DGN/25-NOV-97 13:48/CJW

CALTRAIN RAILROAD TRACKS

ABANDONED RAILROAD TRACKS

FORMER UST AREA

P-19B TD-ND TD-ND (8.5-9.0)
P-19C TD-1,300 TD-710 (6.0-6.5)
P-19E TD-1,700 TD-980 (6.0-6.5)
P-19G TD-340 TD-190 (6.5-7.0)
P-19I TD-740 TD-210 (3.5-4.0)
P-19A TD-220 TD-30 (3.5-4.0)
P-19H TD-890 TD-66 (3.5-4.0)
P-19D TD-2,600 TD-1,500 (7.0-7.5)
KMW-4A
KMW-3B
KMW-6B
KMW-7A

P-10A
P-10B
P-10C
P-10D
P-10E
P-11C
P-11D
P-11E
MW-10A
MW-10B
P-21A
P-20A

E (OH)
TP-2

36" EUC
24" EUC
24" EUC
20" EUC
20" EUC
STORM DRAIN JUNCTION BOX
P-12B
P-12A
MK-12B
MK-8A
SDP-3
FORMER METALS DISPOSAL AREA

DRAINAGE DITCH
12" SD
AC ROADWAY
SDP-1
SDP-2
P-15D
P-15C
P-15B TC-1,800 TD-380 (6.0-6.5)
P-15A TC-24,000 TD-6,100 (5.5-6.0)
P-13B
P-13A
P-14B
P-14A
LF-7A
EXISTING DRAINAGE CHANNEL

P-3A TC-ND TD-ND (5.0-5.5)
P-2B TC-ND TD-ND (5.5-6.0)
P-1A TC-58 TD-15 (2.5-3.0)
P-1B TC-950 TD-160 (6.0-6.5)
P-1C TC-36,000 TD-8,400 (2.5-3.0)
P-2C TC-44,000 TD-14,000 (6.5-6.0)
P-3B TC-27,000 TD-6,600 (5.5-6.0)
P-3C TC-46,000 TD-14,000 (7.0-7.5)
P-4A TC-16,000 TD-3,900 (6.5-7.0)
P-4B TC-5,700 TD-1,400 (6.0-6.5)
P-3D TC-39,000 TD-13,000 (8.5-9.0)
P-4C TC-10,000 TD-1,300 (4.5-5.0)
P-4D TC-11,000 TD-3,500 (5.0-5.5)
P-16A TC-2,200 TD-240 (4.0-4.5)
P-9B TC-18,000 TD-11,000 (2.5-3.0)
P-9A TC-8,100 TD-4,100 (3.0-3.5)
P-9C TC-3,600 TD-380 (2.5-3.0)
P-17A TC-13,000 TD-7,800 (3.5-4.0)
P-8C TC-3,300 TD-10,000 (9.5-10.0)
P-8B TC-2,900 TD-310 (2.5-3.0)
P-7C TC-83,000 TD-27,000 (7.5-8.0)
P-6C TC-120,000 TD-4,000 (4.5-5.0)
P-5B TC-75,000 TD-24,000 (5.5-6.0)
P-5A TC-7,300 TD-1,800 (8.0-8.5)
P-6B TC-ND TD-ND (7.5-8.0)
P-7B TC-25,000 TD-7,100 (7.0-7.5)
P-8A TC-42,000 TD-15,000 (3.0-3.5)
P-7A TC-72,000 TD-19,000 (7.5-8.0)
P-18B TC-16,000 TD-8,600 (3.0-3.5)
P-18A TC-7,200 TD-2,000 (1.5-2.0)

MW-15A
MW-16B
MW-14A
MW-13A
MW-13B
MW-17A
MW-17B
MK-7B
MK-7A

LF-5A
LF-5B
LF-4A
LF-4B
LF-6B
LF-8A
LF-8B

FORMER OIL TANK (APPROXIMATE)
TURNTABLE
ROUNDHOUSE
6' CHAIN LINK FENCE
AC ROADWAY
INDUSTRIAL WAY

1,000
10,000
50,000

LEGEND

- ⊙ GEOPROBE LOCATION
- ⊕ MONITORING WELL LOCATION
- TC-58 TOTAL PETROLEUM HYDROCARBONS AS BUNKER C CONCENTRATIONS (IN MILLIGRAMS PER KILOGRAM)
- TC-15 TOTAL PETROLEUM HYDROCARBONS AS DIESEL FUEL CONCENTRATION (IN MILLIGRAMS PER KILOGRAMS)
- (2.5-3.0) SAMPLE DEPTH (IN FET BELOW GROUND SURFACE)
- ND NOT DETECTED
- 1,000 LINE OF EQUAL CONCENTRATION OF TPH AS BUNKER C (IN MILLIGRAMS PER KILOGRAM). DASHED WHERE INFERRED.

100' 0' 100' 200'
SCALE IN FEET

Burns & McDonnell Waste Consultants Inc.

Figure 3
MAXIMUM TOTAL PETROLEUM HYDROCARBON CONCENTRATIONS IN SOIL
FORMER BAYSHORE RAILYARD
BRISBANE, CALIFORNIA

SUM0002.DGN/29-OCT-97 14:57/CLW
k:\sunquest\sustmwc136x24.dgn
k:\sunquest\sustmeungmap.dgn

CALTRAIN RAILROAD TRACKS

P-19B
P-19E P-19C
P-19I P-19G
P-19D P-19A
P-19H
PYRENE-680
CHRYSENE-440
BENZO (b) FLOURANTHENE-340
BENZO (k) FLOURANTHENE-470
BENZO (a) PYRENE-560
BENZO (g,h,i) PERYLENE
(3.5-4.0)

KMW-4A
KMW-3B

FORMER UST AREA

KMW-6B
KMW-7A

P-10A
P-10B
P-11C
ABANDONED RAILROAD TRACKS
P-10C
MW-10A
MW-10B
P-11D
E (OH)
TP-2
36" EUC
24" EUC
24" EUC
20" EUC
20" EUC
STORM DRAIN JUNCTION BOX
P-12B
P-10D
P-21A
P-11E
P-20A
P-10E
FORMER METALS DISPOSAL AREA
SDP-3
MK-12B
MK-8A
P-12A
P-1C
PHENANTHRENE-2,100
FLOURANTHENE-11,000
PYRENE-13,000
BENZO (a) ANTHRACENE-3,800
CHRYSENE-4,600
BENZO (b) FLOURANTHENE-5,100
BENZO(k) FLOURANTHENE-5,200
BENZO (a) PYRENE-6,500
INDENO (1,2,3-cd) PYRENE-3,700
BENZO (g,h,i) PERYLENE-4,400
(8.0-8.5)
DRAINAGE DITCH
P-3A
SDP-1
P-15D
AC ROADWAY
SDP-2
P-3B
P-4A
P-15C
P-13B
P-1A
P-2B
LF-5A
LF-5B
P-3C
P-1B
P-16A
AC ROADWAY
P-4B
P-15B
LF-7A
EXISTING DRAINAGE CHANNEL
P-13A
P-2C
12" SD
P-4C
P-15A
P-14B
LF-4A
LF-4B
EXISTING DRAINAGE CHANNEL
P-3D
ND
(6.5-7.0)
P-4D
MK-7B
MK-7A
P-14A
LF-6B
MW-15A
MW-14A
P-9B
P-9A
ND
(3.0-3.5)
FORMER OIL TANK (APPROXIMATE)
P-17A
P-9C
P-5B
LF-8B
LF-8A
6' CHAIN LINK FENCE
MW-16B
P-8C
P-7C
MW-13A
P-6C
MW-13B
P-6B
P-5A
ND
(8.0-8.5)
TURNTABLE
P-8B
P-8A
P-7B
ROUNDHOUSE
P-7A
2-METHYLNAPHTHALENE-54,000
(7.5-8.0)
MW-17A
MW-17B
P-18B
INDUSTRIAL WAY
P-18A

LEGEND

- ⊙ GEOPROBE LOCATION
- ⊕ MONITORING WELL LOCATION
- PYRENE-680 SEMIVOLATILE ORGANIC COMPOUND CONCENTRATIONS (IN MICROGRAMS PER KILOGRAM)
- (3.0-3.5) SAMPLE DEPTH (IN FEET BELOW GROUND SURFACE)
- ND NOT DETECTED

100' 0' 100' 200'
SCALE IN FEET

Figure 4
SEMIVOLATILE ORAGANIC COMPOUND CONCENTRATIONS IN SOIL
FORMER BAYSHORE RAILYARD
BRISBANE, CALIFORNIA

Treadwell & Rollo
Treadwell & Rollo Inc.

k:\sun\qust\austin\sec136\z4i.dgn
k:\sun\qust\austin\sunmap.dgn
SUN0003.DGN/25-NOV-97 13:48/CJW

CALTRAIN RAILROAD TRACKS

P-19B
P-19E P-19C
P-19I P-19G
P-19A P-19D
ND
P-19H

KMW-4A
KMW-3B

KMW-7A
KMW-6B

FORMER UST AREA

P-10A
P-10B
P-11C
ABANDONED RAILROAD TRACKS
P-10C MW-10A MW-10B
P-11D
E (OH)
TP-2
36" EUC
24" EUC
24" EUC
20" EUC
20" EUC
STORM DRAIN JUNCTION BOX
P-12B
P-10D
P-21A
P-11E
P-20A
P-10E
FORMER METALS DISPOSAL AREA
SDP-3
MK-12B
MK-8A
P-12A
AC ROADWAY
SDP-1
P-15D
SDP-2
P-3A
P-3B
P-4A
P-15C
P-13B
DRAINAGE DITCH
12" SD
LF-5A
LF-5B
P-1A
P-2B
P-3C
AC ROADWAY
P-4B
P-15B
LF-7A
EXISTING DRAINAGE CHANNEL
P-13A
AC ROADWAY
P-16A
P-1B
ND
P-1C
P-2C
P-4C
P-15A
P-14B
LF-6B
MW-15A
LF-4A
LF-4B
EXISTING DRAINAGE CHANNEL
P-3D
PHENANTHRENE-590
P-4D
MK-7B
MK-7A
P-14A
MW-14A
P-9B
FORMER OIL TANK (APPROXIMATE)
P-9A
ND
P-9C
P-17A
P-7C
NAPHTHALENE-51
MW-13A
P-6C
P-5B
LF-8B
LF-8A
6' CHAIN LINK FENCE
MW-16B
P-8C
MW-13B
P-6B
P-5A
PHENOL-37
TURNTABLE
P-8B
P-8A
P-7B
ROUNDHOUSE
P-7A
MW-17A
MW-17B
P-18B
INDUSTRIAL WAY
P-18A

LEGEND

⊙	GEOPROBE LOCATION
⊕	MONITORING WELL LOCATION
PHENOL-37	SEMIVOLATILE ORGANIC COMPOUND CONCENTRATIONS (IN MICROGRAMS PER LITER)
ND	NOT DETECTED

100' 0' 100' 200'
SCALE IN FEET

Figure 7
SEMIVOLATILE ORGANIC COMPOUND CONCENTRATIONS IN GROUNDWATER
FORMER BAYSHORE RAILYARD
BRISBANE, CALIFORNIA

Burns & McDonnell Waste Consultants, Inc.

k:\eurquast\sustmisc\36x24.dgn
k:\eurquast\sustmisc\eurqhdp.dgn
SUN0006.DGN/25-NOV-97 14:15/CJW

CALTRAIN RAILROAD TRACKS

P-19B
P-19E
P-19C
P-19I
P-19G
P-19A
P-19D
P-19H
KMW-4A
KMW-3B

KMW-6B
KMW-7A

FORMER UST AREA

P-10A
CU-18/650
PB-ND/110
P-10B
P-11C
ABANDONED RAILROAD TRACKS
P-10C
MW-10A
MW-10B
P-11D
P-10D
P-11E
CU-45/450
PB-ND/710
36" EUC
STORM DRAIN JUNCTION BOX
24" EUC
24" EUC
20" EUC
20" EUC
P-12B
CU-NA/1,700
PB-NA/4,500
P-21A
CU-110/1,800
PB-12/5,500
FORMER METALS DISPOSAL AREA
P-20A
P-10E
CU-56/210
PB-6.8/410
SDP-3
MK-12B
MK-8A
P-12A
E (OH)
TP-2
SDP-1
AC ROADWAY
P-15D
SDP-2
P-13B
DRAINAGE DITCH
P-3A
P-3B
P-4A
P-15C
CU-NA/200
PB-NA/230
1,000
P-15B
P-4B
P-1A
P-2B
LF-5A
LF-5B
P-3C
P-1B
P-16A
P-1C
P-2C
12" SD
AC ROADWAY
LF-7A
EXISTING DRAINAGE CHANNEL
P-14B
P-13A
CU-14/850
PB-ND/300
P-15A
CU-ND/1,400
PB-ND/1,500
LF-4A
LF-4B
EXISTING DRAINAGE CHANNEL
P-3D
P-4C
P-4D
LF-6B
MW-15A
MW-14A
MK-7B
MK-7A
P-14A
CU-200/4,500
PB-35/12,000
P-9B
P-9A
P-9C
FORMER OIL TANK (APPROXIMATE)
P-17A
P-5B
LF-8B
LF-8A
6' CHAIN LINK FENCE
MW-16B
P-7C
MW-13A
P-6C
P-8C
MW-13B
P-6B
P-8A
P-5A
P-8B
P-7B
TURNTABLE
ROUNDHOUSE
P-8A
P-7A
MW-17A
MW-17B
P-18B
INDUSTRIAL WAY
P-18A

LEGEND

- ⊙ GEOPROBE LOCATION
- ⊕ MONITORING WELL LOCATION
- CU-56/210 DISSOLVED/ TOTAL COPPER CONCENTRATIONS (IN MICROGRAMS PER LITER)
- PB-6.8/410 DISSOLVED/ TOTAL LEAD CONCENTRATIONS (IN MICROGRAMS PER LITER)
- ND NOT DETECTED
- NA NOT ANALYZED
- 1,000 TOTAL LEAD CONCENTRATION (IN MICROGRAMS PER LITER) DASHED WHERE INFERED

100' 0' 100' 200'
SCALE IN FEET

Figure 8
COPPER AND LEAD CONCENTRATIONS IN GROUNDWATER
FORMER BAYSHORE RAILYARD
BRISBANE, CALIFORNIA

Burns & McDonnell World Consultants Inc.

SUN0007.DGN/23-OCT-97 15:31/CJW k:\sun\gas\fbusfrm\sun136x24.dgn k:\sun\gas\fbusfrm\sunmap.dgn

Burns & McDonnell Waste Consultants, Inc.

October 9, 1998

Mr Randy Lee
San Francisco Bay Regional Water Quality Control Board
1515 Clay Street, Suite 1400
Oakland, CA 94612

Subject: **Groundwater Plume Stability Evaluation**
Former Bayshore Railyard, Brisbane, California

Dear Mr Lee:

This letter presents the results of the groundwater plume stability evaluation for the southern portion of the former Bayshore Railyard in Brisbane, California (the site) This evaluation was requested in your letter dated April 13, 1998, and was conducted on behalf of Sunquest Properties, Inc. (Sunquest) by Burns & McDonnell Waste Consultants, Inc (BMWCI). A Site Plan is attached as Figure 1

Purpose and Scope of Work

The purpose of the work was to evaluate groundwater plume stability to support the remedial action objectives (RAOs) currently being developed for the site Because RAO development must consider the risk to surface water bodies posed by residual contamination, the plume stability evaluation is a key component of the process

The scope of work for the evaluation included reviewing and compiling groundwater monitoring data, and plotting the data versus both time and distance from the source The resulting trends are indicators of groundwater plume stability In addition to this analytical evaluation, historical trends in annual precipitation amounts and laboratory analytical methods were evaluated for potential effects on the plume stability analysis.

Data Review and Compilation

BMWCI reviewed and compiled relevant historical groundwater monitoring data for use in the groundwater plume stability analysis. Since it is critical to evaluate plume stability along the direction of groundwater flow beneath the site, previous groundwater monitoring reports were reviewed to confirm the predominant groundwater flow direction. The groundwater flow direction has been reported to be to the south or the southeast, with some local variations

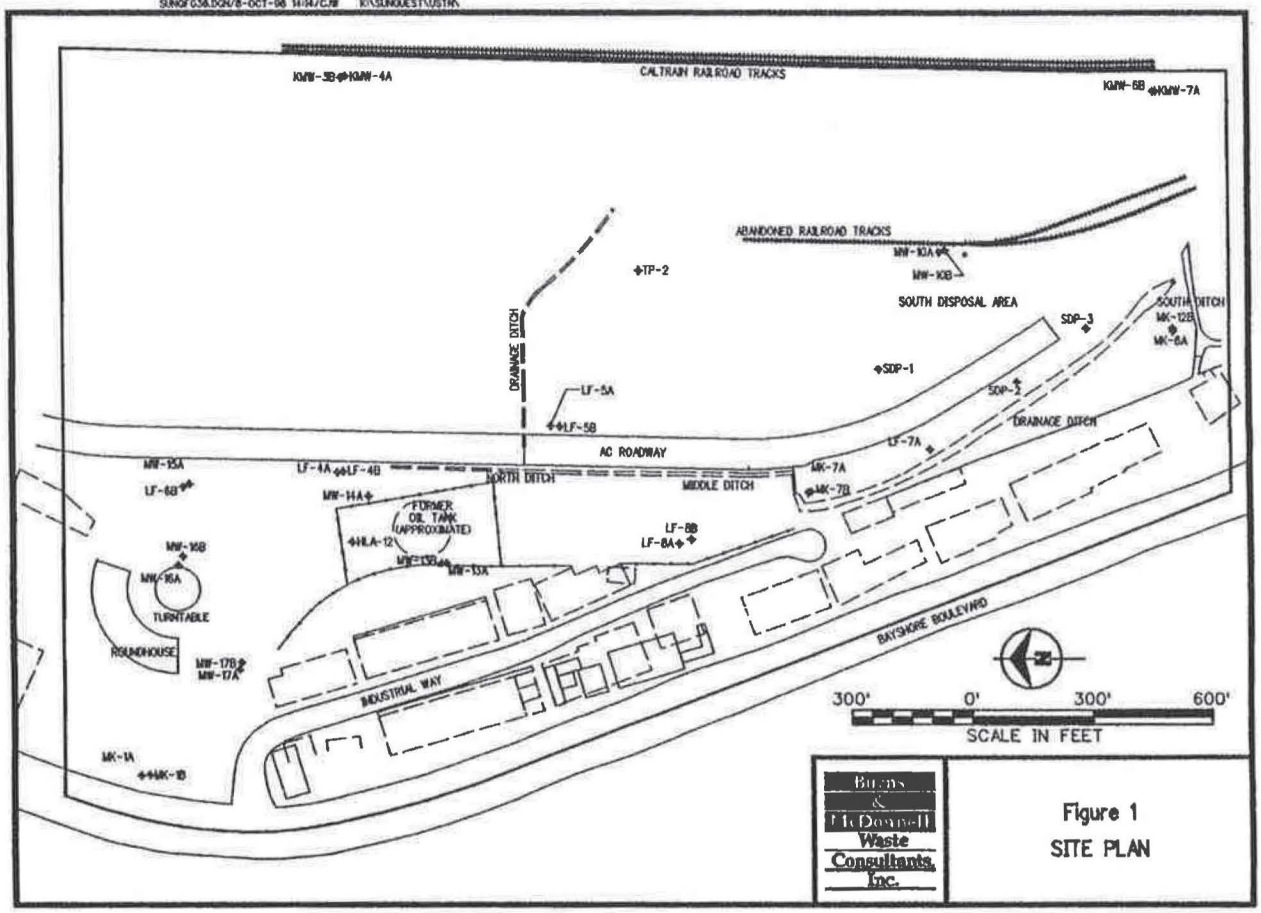
377 Oyster Point Boulevard
Suite 13
South San Francisco, California 94080

Phone: 650 871-2926
Fax: 650 871-2653
http://www.burnsmcd.com
California Contractor #709602

A Burns & McDonnell Company

Table 1
TPH as Bunker C Oil Concentrations
Former Bayshore Railyard
Sunquest Properties, Inc.

	Nov-95		Sep-96		Jun-97		Dec-97		Jun-98	
Well Number	GW Elevation (feet)	Bunker C Conc. (mg/l)	GW Elevation (feet)	Bunker C Conc. (mg/l)	GW Elevation (feet)	Bunker C Conc. (mg/l)	GW Elevation (feet)	Bunker C Conc. (mg/l)	GW Elevation (feet)	Bunker C Conc. (mg/l)
MW-15A	4.04	98	4.08	83	4.47	93	1.14	22	5.82	47
LF-4A	4.02	90.6	4.04	32	4.47	77	6.07	79	5.75	89
LF-5A	4.03	5.95	4.05	5.9	4.44	5.9	5.86	5.3	5.66	3.7
LF-8A	3.71	33.4	3.74	36	4.15	50	5.42	30	5.07	35
MK-7A	3.66	1	3.74	ND<0.05	4.14	0.51	4.99	0.68	5.65	0.62


CALTRAIN RAILROAD TRACKS
ABANDONED RAILROAD TRACKS
SOUTH DISPOSAL AREA
SOUTH DITCH
DRAINAGE DITCH
AC ROADWAY
NORTH DITCH
MIDDLE DITCH
FORMER OIL TANK (APPROXIMATE)
TURNTABLE
ROUNDHOUSE
INDUSTRIAL WAY
BAYSHORE BOULEVARD
300' 0' 300' 600'
SCALE IN FEET
Burns & McDonnell Waste Consultants, Inc.
Figure 1
SITE PLAN

REMEDIAL ACTION PLAN

SOUTHERN AREA OF
FORMER BAYSHORE RAILYARD SITE
BRISBANE, CALIFORNIA

Prepared For:

SUNQUEST PROPERTIES, INC
150 Executive Park Boulevard, Suite 4200
San Francisco, California

October 1999

Prepared by:

Burns & McDonnell Waste Consultants, Inc.
Engineers-Geologists-Scientists
South San Francisco, California

Project Number 98-380-4

Table 1
Recent Characterization
Non-Metals Analytical Results

Sunquest Properties, Inc.
Former Bayshore Railyard

Boring ID	Sample Depth	TPH (mg/Kg)				PCBs	VOCs	SVOCs
		diesel	motor oil	bunker C	gas & BTEX	(ug/Kg)	(ug/Kg)	(ug/Kg)
Q-1	5.0-6.0	220	1000	2200	...	...	...	...
Q-2A	3.5-4.0	<10	<50	<50	...	...	...	...
Q-2B	6.0-6.5	...	...	...	...	...	...	...
Q-3A	1.5-2.0	<10	<50	<50	...	...	...	...
Q-3B	6.0-6.5	...	...	...	...	...	...	...
Q-4A	1.5-2.0	...	...	...	...	ND	...	...
Q-4B	4.5-5.0	<10	<50	<50	...	...	...	...
Q-5A	6.5-7.5	170	240	730	580(1)	...	ND	...
Q-6	8.0-9.0	260	930	2200	...	...	...	ND
Q-7A	1.5-2.0	...	...	...	...	7	...	
Q-7B	5.5-6.0	3200	8300	21000	...	...	...	ND
Q-8A	4.0-4.5	...	...	...	...	12	...	...
Q-8B	4.5-5.0	790	2800	6300	...	...	...	...
Q-9	5.5-6.5	16000	18000	69000	...	...	...	ND
Q-10	7.0-8.0	<10	<50	<50	...	ND	...	...
Q-11	3.0-4.0	<10	<50	<50	...	...	ND	...
Q-12	2.5-3.0	15	<50	69	...	...	...	...
Q-13A	1.0-1.5	...	...	...	...	ND	...	...
Q-13B	4.0-4.5	<10	<50	<50	...	...	ND	...
Q-14	3.5-4.0	180	900	2100	...	...	...	ND
Q-15	4.0-4.5	<10	<50	<50	...	...	ND	...
Q-16	3.0-4.0	20	81	160	...	...	...	...
Q-17A	1.0-1.5	50	120	280	...	28	...	...
Q-17B	7.5-8.0	...	...	...	...	...	...	...
Q-18A	2.0-2.5	...	...	...	...	ND	...	...
Q-18B	5.0-5.5	37	120	260	...	...	ND	ND
Q-19A	1.5-2.0	...	...	...	...	ND	...	...
Q-19B	6.5-7.0	<10	<50	<50	...	...	...	...
Q-19C	7.0-7.5	...	...	...	...	...	ND	...
Q-20	3.0-4.0	<10	<50	100	...	...	...	...
Q-21	6.0-7.0	<10	<50	59	...	...	...	...

1 - Q-5a toulene=1400 ug/L

Table 2
Recent Characterization
Metals Analytical Results

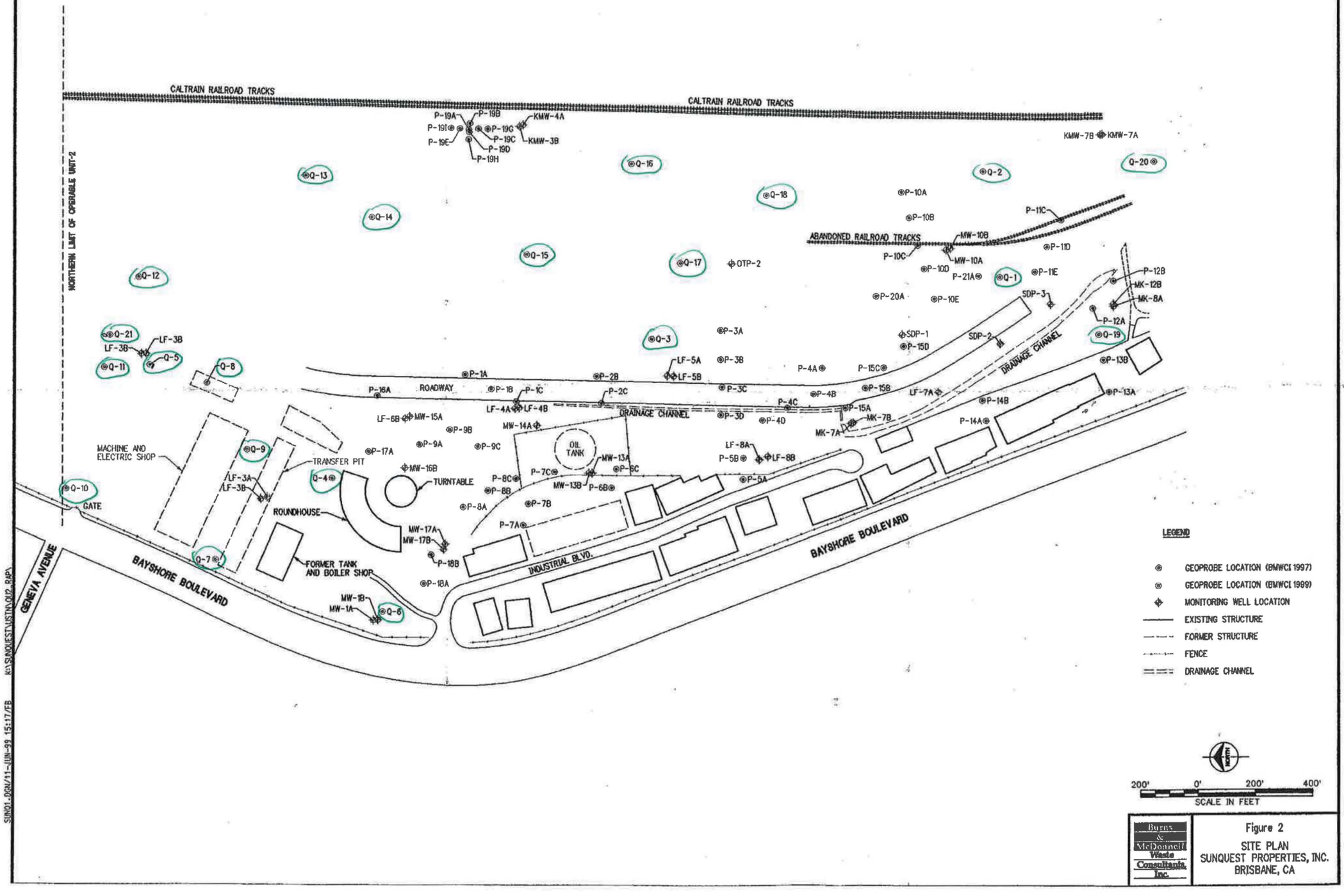
Sunquest Properties, Inc.
Former Bayshore Railyard

Boring ID	Sample Depth	Antimony	Arsenic	Barium	Cadmium	Copper	Lead	Molybdenum	Silver	Zinc
Q-2B	6.0-6.5	ND	20	70	ND	17	2.5	ND	ND	37
Q-3B	6.0-6.5	24	14	1100	2.3	580	7600	ND	4.7	1700
Q-8B	4.5-5.0	10	24	61	0.95	240	640	1.5	ND	320
Q-13A	1.0-1.5	ND	99	50	ND	21	7.7	ND	ND	52
Q-17B	7.5-8.0	19	20	880	1.2	390	1700	1.4	3.4	1500
Q-19B	6.5-7.0	18	21	1000	2.8	480	7400	ND	6.1	2100
Q-20	3.0-4.0	ND	86	39	0.17	19	12	ND	ND	61

All results in mg/Kg

Sb As Ba Cd Cu Pb Mo Ag Zn

Title 22 Metals


CALTRAIN RAILROAD TRACKS
CALTRAIN RAILROAD TRACKS
NORTHERN LIMIT OF OPERABLE UNIT-2
P-19A
P-19B
KMW-4A
P-19I
P-19G
P-19C
KMW-3B
P-19E
P-19D
P-19H
KMW-7B
KMW-7A
Q-13
Q-16
Q-20
Q-2
Q-14
Q-18
P-10A
P-10B
P-11C
ABANDONED RAILROAD TRACKS
MW-10B
P-10C
P-11D
MW-10A
Q-12
Q-15
Q-17
OTP-2
P-10D
P-21A
Q-1
P-11E
P-12B
MK-12B
MK-8A
P-20A
P-10E
SDP-3
P-12A
Q-21
LF-3B
P-3A
Q-3
SDP-1
SDP-2
Q-19
DRAINAGE CHANNEL
LF-3B
Q-5
LF-5A
P-3B
P-15D
P-13B
Q-11
Q-8
P-4A
P-15C
P-1A
P-2B
LF-5B
P-3C
P-15B
P-13A
P-16A
ROADWAY
P-1B
P-1C
P-2C
P-4B
LF-7A
P-14B
LF-4A
LF-4B
P-4C
P-15A
DRAINAGE CHANNEL
P-3D
P-4D
MK-7B
P-14A
LF-6B
MW-15A
MW-14A
MK-7A
P-9B
OIL TANK
LF-8A
MACHINE AND ELECTRIC SHOP
Q-9
P-17A
P-9A
P-9C
TRANSFER PIT
MW-16B
MW-13A
P-5B
LF-8B
LF-3A
LF-3B
Q-4
TURNTABLE
P-8C
P-7C
P-6C
P-5A
Q-10
GATE
P-8B
MW-13B
P-6B
P-8A
P-7B
ROUNDHOUSE
P-7A
MW-17A
MW-17B
INDUSTRIAL BLVD.
BAYSHORE BOULEVARD
Q-7
P-18B
FORMER TANK AND BOILER SHOP
GENEVA AVENUE
BAYSHORE BOULEVARD
P-18A
MW-1B
MW-1A
Q-6
LEGEND
GEOPROBE LOCATION (BMWCI 1997)
GEOPROBE LOCATION (BMWCI 1999)
MONITORING WELL LOCATION
EXISTING STRUCTURE
FORMER STRUCTURE
FENCE
DRAINAGE CHANNEL
NORTH
200' 0' 200' 400'
SCALE IN FEET
Burns & McDonnell Waste Consultants, Inc.
Figure 2
SITE PLAN
SUNQUEST PROPERTIES, INC.
BRISBANE, CA

INVESTIGATION REPORT

Supplemental Bunker C Delineation

Southern Area of the

Former Bayshore Railyard Site

Brisbane, California

Prepared For:

SUNQUEST PROPERTIES, INC.

150 Executive Park Boulevard, Suite 4200

San Francisco, California

August 2001

Prepared By:

Burns & McDonnell Engineering, Inc.

Engineers-Geologists-Scientists

South San Francisco, California

Project Number 23672

Table 3
Bunker C Oil Concentrations in Groundwater
Southern Portion of the Former Bayshore Railyard
Brisbane, CA

Sample ID	TPHc	TPHc SGCU
KMW-4A	1,400 Y	ND
KMW-7A	3,000 Y	ND
LF-3A	910 Y	ND
LF-4A	84,000 Y	300 Y
LF-5A	3,800 Y	ND
LF-7A	930 Y	ND
LF-8A	32,000 Y	9,200 Y
MK-1A	2,200 Y	ND
MK-7A	1,600 Y	ND
MK-8A	ND	ND
MW-10A	510 Y	ND
MW-11A	NA	NA
MW-13A	8,300 Y	ND
MW-15A	65,000 Y	1,700 Y
MW-17A	16,000 Y	ND
North Ditch	NA	NA
Middle Ditch	NA	NA
South Ditch	2,900 Y	ND
Outflow	2,000 Y	ND

Concentrations are in units of micrograms per liter (ug/L)
TPH - Total Petroleum Hydrocarbons
TPHg - TPH as gasoline
TPHd - TPH as diesel
TPHm - TPH as motor oil
TPHc - TPH as Bunker C oil
Y - Sample exhibits fuel pattern which does not resemble standard
ND - Not Detected
NA - Not Analyzed
SGCU- Analysis performed with Silica Gel Cleanup

Table 4
Comparison of Cu and Pb Concentrations in Soil and Groundwater
A-Fill Zone
Southern Portion of the Former Bayshore Railyard

Groundwater Data					Soil Data [2]				
Sample ID	Depth [1]	Date	Cu (mg/L)	Pb (mg/L)	Sample ID	Depth [1]	Date	Cu (mg/kg)	Pb (mg/kg)
LF-7A	6 38	Dec 2000	ND	ND	LF-7A-11	11	1990	21	3
					P-14A	6.5		690	3600
					P-15D	5		39	17
					SDSB-1-4.5A	4.5	1990	3300	2700
					SDSB-2-8A	8	1990	3500	3700
					SDSB-10-5A	10	1990	900	2400
MK-7A	6 33	Dec 2000	ND	ND	MK-7B-1	2	1986	12	3.8
					MK-7B-2	4	1986	820	3800
					P-15A	0.5		77	59
					P-15B	6		40	11
MK-8A	11 1	Dec 2000	ND	ND	MK-8A-1	2	1986	25	800
					MK-8A-2	4	1986	4100	7800
					MW-12B	6.5	1984	2810	3590
					P-12A	5.5		1100	11000
					P-12B	9.5		12	6
					P-13B	9.5		3400	6000
					SDP-5-6	6	1990	900	4600
					SDSB-3-3.5A	3.5	1990	3400	1700
					SDSB-3-10B	10	1990	48	8
					SDSB-5-4.5	4.5	1990	1500	2000
					SDSB-6-4A	4	1990	2800	6700
MW-10A	6 38	36861	ND	ND	MW-10A-1	3	1984	74.3	2.7
					MW-10B-1	3	1984	132	101
					P-10-B	5.5		36	20
					P-10-C	0.25		610	900
					P-10-D	5.5		26	40
					P-10-E	0.25		220	250
					P-21A	3.5		18000	13000

1 Depths are in feet below ground surface.
2 Soil data within 200 feet of the water sample.

Highest soil sample result within the 200 foot radius

CALTRAIN RAILROAD TRACKS

CALTRAIN RAILROAD TRACKS

NORTHERN LIMIT OF OPERABLE UNIT-2

ABANDONED RAILROAD TRACKS

DRAINAGE CHANNEL

ROADWAY

OIL TANK

MACHINE AND ELECTRIC SHOP

TURNTABLE

ROUNDHOUSE

GATE

FORMER TANK AND BOILER SHOP

INDUSTRIAL BLVD.

BAYSHORE BOULEVARD

GENEVA AVENUE

BAYSHORE BOULEVARD

LEGEND

- GEOPROBE LOCATION (BMWCI 1997)
- GEOPROBE LOCATION (BMWCI 1999)
- GEOPROBE LOCATION (BMWCI 2000)
- BORING LOCATION (BY OTHERS)
- MONITORING WELL LOCATION
- EXISTING STRUCTURE
- FORMER STRUCTURE
- FENCE
- DRAINAGE CHANNEL

NORTH

200' 0' 200' 400'

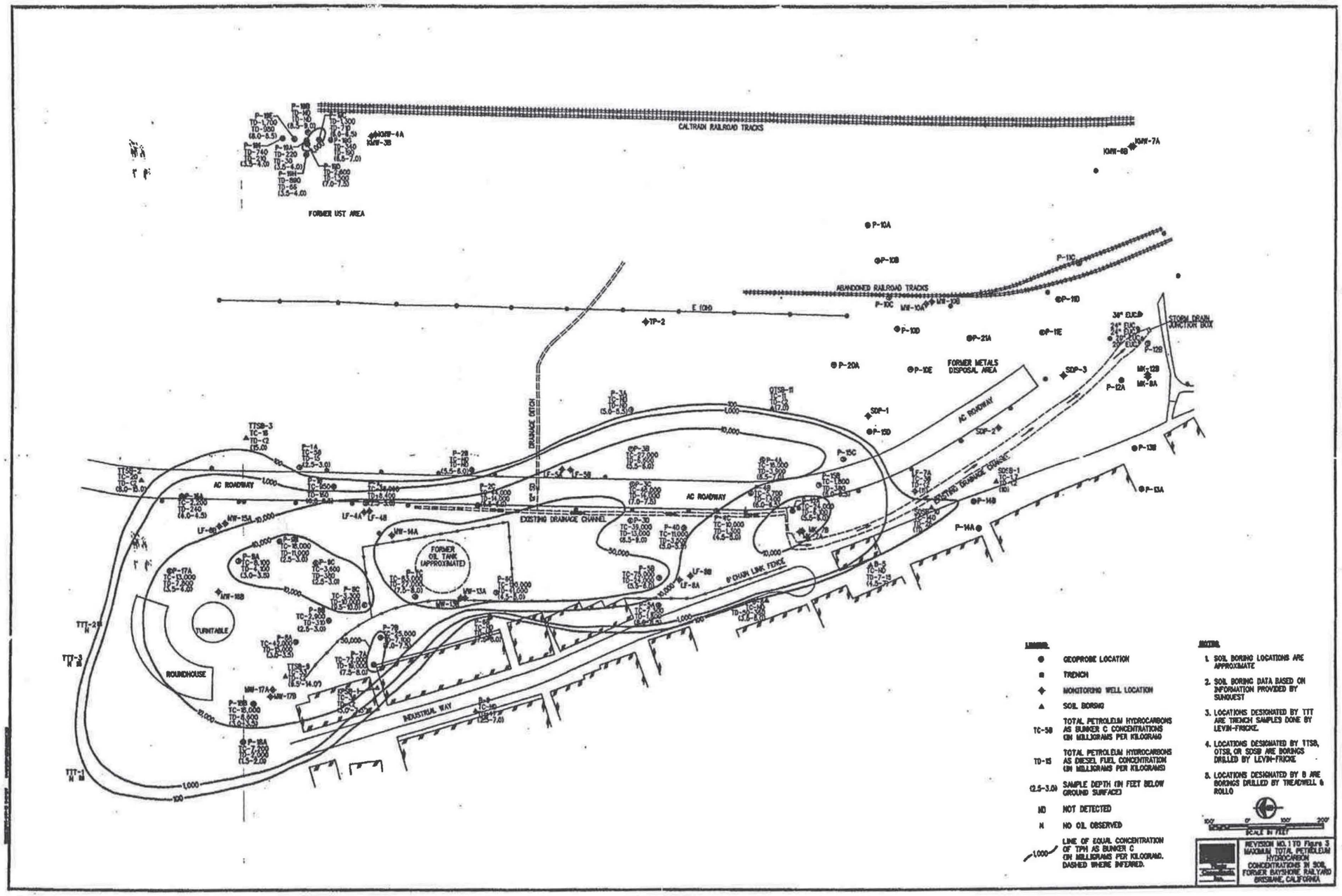
SCALE IN FEET

Burns & McDonnell Waste Consultants, Inc.

Figure 2

SITE PLAN
SUNQUEST PROPERTIES, INC.
BRISBANE, CA

SUNSITE.DGN/ 8-14-2001 12:53:FB K:\SUNQUEST\SITN\OU2.RPA



LEGEND

- GEOPROBE LOCATION
- TRENCH
- MONITORING WELL LOCATION
- SOIL BORING
- TC-58 — TOTAL PETROLEUM HYDROCARBONS AS BUNKER C CONCENTRATIONS (IN MILLIGRAMS PER KILOGRAM)
- TD-15 — TOTAL PETROLEUM HYDROCARBONS AS DIESEL FUEL CONCENTRATION (IN MILLIGRAMS PER KILOGRAM)
- (2.5-3.0) — SAMPLE DEPTH (IN FEET BELOW GROUND SURFACE)
- ND — NOT DETECTED
- N — NO OIL OBSERVED
- 1,000 — LINE OF EQUAL CONCENTRATION OF TPH AS BUNKER C (IN MILLIGRAMS PER KILOGRAM). DASHED WHERE INFERRED.

NOTES

1. SOIL BORING LOCATIONS ARE APPROXIMATE
2. SOIL BORING DATA BASED ON INFORMATION PROVIDED BY SUNQUEST
3. LOCATIONS DESIGNATED BY TTT ARE TRENCH SAMPLES DONE BY LEVIN-FRICKE.
4. LOCATIONS DESIGNATED BY TTSB, OTSB, OR SDSB ARE BORINGS DRILLED BY LEVIN-FRICKE
5. LOCATIONS DESIGNATED BY B ARE BORINGS DRILLED BY TREADWELL & ROLLO

100' 0' 100' 200'
SCALE IN FEET

REVISION NO. 1 TO Figure 3
MAXIMUM TOTAL PETROLEUM HYDROCARBON CONCENTRATIONS IN SOIL
FORMER BAYSHORE RAILYARD
BRISBANE, CALIFORNIA

CALTRAIN RAILROAD TRACKS

CALTRAIN RAILROAD TRACKS

NORTHERN LIMIT OF OPERABLE UNIT-2

ABANDONED RAILROAD TRACKS

ROADWAY

TRANSFER PIT

MACHINE AND ELECTRIC SHOP

GATE

FORMER TANK AND BOILER SHOP

ROUNDHOUSE

TURNTABLE

OIL TANK

DRAINAGE CHANNEL

DRAINAGE CHANNEL

INDUSTRIAL BLVD.

BAYSHORE BOULEVARD

GENEVA AVENUE

DRAFT

LEGEND

- GEOPROBE LOCATION (BMWCI 1997)
- GEOPROBE LOCATION (BMWCI 1999)
- GEOPROBE LOCATION (BMWCI 2000)
- MONITORING WELL LOCATION
- LEAD CONCENTRATION IN EXCEEDENCE OF BASE CASE RAO OF 2,500 mg/Kg
- LEAD CONCENTRATION IN EXCEEDENCE OF UTILITY WORKER RAO OF 132 mg/Kg
- 3,800 LEAD CONCENTRATION (mg/Kg)
- EXISTING STRUCTURE
- FORMER STRUCTURE
- FENCE
- DRAINAGE CHANNEL

NOTE

Metals analyses in May to June 2000 included Antimony, Arsenic, Barium, Beryllium, Cadmium, Cobalt, Copper, Lead, Molybdenum, Nickel, Selenium, Silver, Thallium, Vanadium, and Zinc. See Table 2 for other detections.

NORTH

200' 0' 200' 400'

SCALE IN FEET

Burns & McDonnell Waste Consultants, Inc.

Figure 4

LEAD IMPACTED AREAS
A-FILL ZONE SOIL
SUNQUEST PROPERTIES, INC.
BRISBANE, CA

SINGLE.DGN/ 5-01-2001 12:22:FB RASINGUEST\ISTN\002.RAP\

CALTRAIN RAILROAD TRACKS

CALTRAIN RAILROAD TRACKS

NORTHERN LIMIT OF OPERABLE UNIT-2

ABANDONED RAILROAD TRACKS

ROADWAY

DRAINAGE CHANNEL

MACHINE AND ELECTRIC SHOP

GATE

FORMER TANK AND BOILER SHOP

ROUNDHOUSE

TURNTABLE

OIL TANK

INDUSTRIAL BLVD.

GENEVA AVENUE

BAYSHORE BOULEVARD

BAYSHORE BOULEVARD

LEGEND

- GEOPROBE LOCATION (BMWCI 2000)
- BORING LOCATION (BY OTHERS)
- MONITORING WELL LOCATION
- INDICATES CHLORINATED VOCs RESULTS (mg/Kg)
- INDICATES NON-CHLORINATED VOCs RESULTS (mg/Kg)
- EXISTING STRUCTURE
- FORMER STRUCTURE
- FENCE
- DRAINAGE CHANNEL

NORTH

200' 0' 200' 400'

SCALE IN FEET

McDonnell Waste Consultants, Inc.

Figure 5
VOCs RESULTS
A-FILL ZONE
SUNQUEST PROPERTIES, INC.
BRISBANE, CA

K:\UNITED\SUNQUEST\SLP\SUNQUEST.DGN 07-21-01
K:\SUNQUEST\USTN\SUNQUEST.DGN 07-13-01/S-R,22-1N,29,33-35,42-43,48-47,51-53,58,62-63

SUNQVOCS.DGN/ 8-14-2001 13:30/FB K:\SUNQUEST\USTN\OU2.RAP

REVISED REMEDIAL ACTION PLAN

Southern Area of the

Former Bayshore Railyard Site

Brisbane, California

February 2002

Prepared For:

SUNQUEST PROPERTIES, INC.

150 Executive Park Boulevard, Suite 4200

San Francisco, California 94134

Project Number 26158

Prepared By:

Burns & McDonnell Engineering, Inc

Engineers-Geologists-Scientists

South San Francisco, California

Table 2
Soil Investigation Results
May to June 2000
Southern Area, Former Bayshore Railyard (OU-2)
Brisbane, California
Sunquest Properties, Inc.

Sample Name			R-1A_SC	R-1B	R-2A_SC	R-2B_SC	R-3B_SC	R-4_SC
Ground Surface Elevation			NS	NS	NS	NS	NS	NS
Bay Mud Depth	RAO*		9.9	9.9	8-12 (NR)	8-12 (NR)	9.8	9.6
Sample Depth (ft)	Base Case		5.5 - 6.0	6.0 - 6.5	5.0 - 5.5	7.0 - 7.5	8.0 - 8.5	8.6 - 9.6
Sampling Date	(Commercial		6/1/00	6/1/00	6/1/00	6/1/00	6/1/00	6/1/00
Laboratory Episode Number	Maint. Worker)		145942-001	C&T 0601.269	145942-003	145942-004	145942-005	145942-006
Parameter		Units						
Total Volatile Hydrocarbons								
Gasoline Range		mg/kg	NA	NA	NA	NA	NA	NA
Stoddard Solvent Range		mg/kg	NA	NA	NA	NA	NA	NA
Total Extractable Hydrocarbons								
Diesel Range	46,000	mg/kg	16,400	NA	NA	686	86,900	7,220
Motor Oil Range		mg/kg	25,000	NA	NA	1,130	130,000	10,600
Bunker C Range	46,000	mg/kg	73,900	NA	NA	3,150	384,000	31,700
VOCs (EPA 8021)								
Benzene		ug/kg	NA	NA	NA	NA	NA	NA
Toluene		ug/kg	NA	NA	NA	NA	NA	NA
Ethylbenzene		ug/kg	NA	NA	NA	NA	NA	NA
m,p-Xylenes		ug/kg	NA	NA	NA	NA	NA	NA
o-Xylenes		ug/kg	NA	NA	NA	NA	NA	NA
HVOCs** (EPA 8260)								
1,2,4-Trimethylbenzene		ug/kg	NA	NA	NA	NA	NA	NA
1,3,5-Trimethylbenzene		ug/kg	NA	NA	NA	NA	NA	NA
Acetone		ug/kg	NA	NA	NA	NA	NA	NA
Ethylbenzene		ug/kg	NA	NA	NA	NA	NA	NA
Isopropylbenzene		ug/kg	NA	NA	NA	NA	NA	NA
m,p-Xylenes		ug/kg	NA	NA	NA	NA	NA	NA
Napthalene		ug/kg	NA	NA	NA	NA	NA	NA
n-Butylbenzene		ug/kg	NA	NA	NA	NA	NA	NA
o-Xylenes		ug/kg	NA	NA	NA	NA	NA	NA
para-Isopropyl Toluene		ug/kg	NA	NA	NA	NA	NA	NA
Propylbenzene		ug/kg	NA	NA	NA	NA	NA	NA
sec-Butylbenzene		ug/kg	NA	NA	NA	NA	NA	NA
Tetrachloroethene		ug/kg	NA	NA	NA	NA	NA	NA
Toluene		ug/kg	NA	NA	NA	NA	NA	NA
Trichloroethene		ug/kg	NA	NA	NA	NA	NA	NA
Semivolatile Organics** (EPA 8270)								
2-Methylnaphthalene	216,236,000	ug/kg	<200,000	NA	NA	NA	<57,000	NA
TITLE 26 Metals								
Antimony	1,658	mg/kg	NA	NA	<58	NA	NA	NA
Arsenic	19	mg/kg	NA	NA	39.0	NA	NA	NA
Barium	290,217	mg/kg	NA	NA	1,300.0	NA	NA	NA
Beryllium		mg/kg	NA	NA	2.4	NA	NA	NA
Cadmium	2,073	mg/kg	NA	NA	6.1	NA	NA	NA
Chromium (total)		mg/kg	NA	NA	23.0	NA	NA	NA
Cobalt		mg/kg	NA	NA	<19	NA	NA	NA
Copper		mg/kg	NA	NA	330.0	NA	NA	NA
Lead	2,464	mg/kg	NA	NA	5,000.0	NA	NA	NA
Molybdenum		mg/kg	NA	NA	<4.9	NA	NA	NA
Nickel		mg/kg	NA	NA	72.0	NA	NA	NA
Selenium		mg/kg	NA	NA	<4.9	NA	NA	NA
Silver	90,603	mg/kg	NA	NA	2.3	NA	NA	NA
Thallium		mg/kg	NA	NA	<4.9	NA	NA	NA
Vanadium		mg/kg	NA	NA	34.0	NA	NA	NA
Zinc		mg/kg	NA	NA	2,400.0	NA	NA	NA
Mercury (EPA 7470)		mg/kg	NA	NA	0.1	NA	NA	NA
Lead (STLC - EPA 6010B)		ug/L	NA	NA	14,000.0	NA	NA	NA
Other								
Herbicides (EPA 8151A)		ug/kg	NA	NA	NA	NA	NA	NA
Pesticides/PCBs (EPA 8081A/8082)		ug/kg	NA	NA	NA	NA	NA	NA
96 hour LC50 Bioassay			NA	PASS	NA	NA	NA	NA

Notes:

*RAO = Soil Remedial Action Objective is listed for Base Case only
is for Commercial Maintenance Worker (see Table 1).

Bold entry indicates exceedence of Base Case RAO.

**Only compounds with detections above reporting limits
are listed for VOCs and SVOCs.

NA - Not analyzed or not applicable.

NS - Elevation not surveyed; see report for coordinates.

NR - No recovery.

ug/kg - micrograms per kilogram

mg/kg - milligrams per kilogram

< less than (not detected at or above this value)

Y - sample exhibits pattern which does not resemble standard

H - heavier hydrocarbons than indicated on standard

L - lighter hydrocarbons than indicated on standard

J - estimated value

Table 2
Soil Investigation Results
May to June 2000
Southern Area, Former Bayshore Railyard (OU-2)
Brisbane, California
Sunquest Properties, Inc.

Sample Name			R-5	R-6B_SC	R-7A_SC	R-7B_SC	R-8B_SC	R-9_SC
Ground Surface Elevation			NS	NS	NS	NS	NS	NS
Bay Mud Depth	RAO*		6	10	9.5	9.5	11.4	9.9
Sample Depth (ft)	Base Case		NA	6.7 - 7.4	6.8 - 7.6	8.4 - 9.0	10.8 - 11.4	4.2 - 5.0
Sampling Date	(Commercial		5/31/00	6/1/00	6/1/00	6/1/00	6/1/00	6/2/00
Laboratory Episode Number	Maint. Worker)		NA	145938-013	145938-014	145938-015	145938-016	145942-013
Parameter		Units						
Total Volatile Hydrocarbons								
Gasoline Range		mg/kg	NA	NA	NA	NA	NA	<0.92
Stoddard Solvent Range		mg/kg	NA	NA	NA	NA	NA	<4.6
Total Extractable Hydrocarbons								
Diesel Range	46,000	mg/kg	NA	48,900	38	NA	827	NA
Motor Oil Range		mg/kg	NA	98,100	101	NA	1,660	NA
Bunker C Range	46,000	mg/kg	NA	230,000	197	NA	4,060	NA
VOCs (EPA 8021)								
Benzene		ug/kg	NA	NA	NA	NA	NA	NA
Toluene		ug/kg	NA	NA	NA	NA	NA	NA
Ethylbenzene		ug/kg	NA	NA	NA	NA	NA	NA
m,p-Xylenes		ug/kg	NA	NA	NA	NA	NA	NA
o-Xylenes		ug/kg	NA	NA	NA	NA	NA	NA
HVOCs** (EPA 8260)								
1,2,4-Trimethylbenzene		ug/kg	NA	NA	NA	NA	NA	<4.8
1,3,5-Trimethylbenzene		ug/kg	NA	NA	NA	NA	NA	<4.8
Acetone		ug/kg	NA	NA	NA	NA	NA	20
Ethylbenzene		ug/kg	NA	NA	NA	NA	NA	<4.8
Isopropylbenzene		ug/kg	NA	NA	NA	NA	NA	<4.8
m,p-Xylenes		ug/kg	NA	NA	NA	NA	NA	<4.8
Napthalene		ug/kg	NA	NA	NA	NA	NA	<4.8
n-Butylbenzene		ug/kg	NA	NA	NA	NA	NA	<4.8
o-Xylenes		ug/kg	NA	NA	NA	NA	NA	<4.8
para-Isopropyl Toluene		ug/kg	NA	NA	NA	NA	NA	<4.8
Propylbenzene		ug/kg	NA	NA	NA	NA	NA	<4.8
sec-Butylbenzene		ug/kg	NA	NA	NA	NA	NA	<4.8
Tetrachloroethene		ug/kg	NA	NA	NA	NA	NA	<4.8
Toluene		ug/kg	NA	NA	NA	NA	NA	<4.8
Trichloroethene		ug/kg	NA	NA	NA	NA	NA	<4.8
Semivolatile Organics** (EPA 8270)								
2-Methylnaphthalene	216,236,000	ug/kg	NA	86000J	NA	NA	NA	NA
TITLE 26 Metals								
Antimony	1,658	mg/kg	NA	NA	NA	<59	NA	NA
Arsenic	19	mg/kg	NA	NA	NA	15.0	NA	NA
Barium	290,217	mg/kg	NA	NA	NA	1,200.0	NA	NA
Beryllium		mg/kg	NA	NA	NA	2.4	NA	NA
Cadmium	2,073	mg/kg	NA	NA	NA	4.6	NA	NA
Chromium (total)		mg/kg	NA	NA	NA	20.0	NA	NA
Cobalt		mg/kg	NA	NA	NA	<20	NA	NA
Copper		mg/kg	NA	NA	NA	580.0	NA	NA
Lead	2,464	mg/kg	NA	NA	NA	**2,500.0**	NA	NA
Molybdenum		mg/kg	NA	NA	NA	<0.99	NA	NA
Nickel		mg/kg	NA	NA	NA	57.0	NA	NA
Selenium		mg/kg	NA	NA	NA	<5	NA	NA
Silver	90,603	mg/kg	NA	NA	NA	4.9	NA	NA
Thallium		mg/kg	NA	NA	NA	5U	NA	NA
Vanadium		mg/kg	NA	NA	NA	22.0	NA	NA
Zinc		mg/kg	NA	NA	NA	2,700.0	NA	NA
Mercury (EPA 7470)		mg/kg	NA	NA	NA	0.6	NA	NA
Lead (STLC - EPA 6010B)		ug/L	NA	NA	NA	180.0	NA	NA
Other								
Herbicides (EPA 8151A)		ug/kg	NA	NA	NA	NA	NA	NA
Pesticides/PCBs (EPA 8081A/8082)		ug/kg	NA	NA	NA	NA	NA	NA
96 hour LC50 Bioassay			NA	NA	NA	NA	NA	NA

Notes:
*RAO = Soil Remedial Action Objective is listed for Base Case only is for Commercial Maintenance Worker (see Table 1).
Bold entry indicates exceedence of Base Case RAO.
**Only compounds with detections above reporting limits are listed for VOCs and SVOCs.
NA - Not analyzed or not applicable.
NS - Elevation not surveyed; see report for coordinates.
NR - No recovery.
ug/kg - micrograms per kilogram
mg/kg - milligrams per kilogram
< less than (not detected at or above this value)
Y - sample exhibits pattern which does not resemble standard
H - heavier hydrocarbons than indicated on standard
L - lighter hydrocarbons than indicated on standard
J - estimated value

Table 2
Soil Investigation Results
May to June 2000
Southern Area, Former Bayshore Railyard (OU-2)
Brisbane, California
Sunquest Properties, Inc.

Sample Name Ground Surface Elevation Bay Mud Depth Sample Depth (ft) Sampling Date Laboratory Episode Number	RAO* Base Case (Commercial Maint. Worker)		R-10A_SC NS 10.4 1.5 - 2.0 6/2/00 00-06-0304-1	R-11B_SC NS 7.8 7.2 - 7.8 6/2/00 145956-001	R-12 NS (Free product at ground surface; not drilled.)	R-13 NS (Free product at ground surface; not drilled.)	R-14B_SC NS Refusal 10.5 10.0 - 10.5 6/1/00 145956-002	R-15B_SC NS 10.4 9.4 - 10.4 6/1/00 145938-017
Parameter		Units						
Total Volatile Hydrocarbons								
Gasoline Range		mg/kg	NA	NA	NA	NA	NA	NA
Stoddard Solvent Range		mg/kg	NA	NA	NA	NA	NA	NA
Total Extractable Hydrocarbons								
Diesel Range	46,000	mg/kg	NA	**117,000**	NA	NA	8,140	23,800
Motor Oil Range		mg/kg	NA	**228,000**	NA	NA	14,800	39,000
Bunker C Range	46,000	mg/kg	NA	**552,000**	NA	NA	36,900	**109,000**
VOCs (EPA 8021)								
Benzene		ug/kg	NA	NA	NA	NA	NA	NA
Toluene		ug/kg	NA	NA	NA	NA	NA	NA
Ethylbenzene		ug/kg	NA	NA	NA	NA	NA	NA
m,p-Xylenes		ug/kg	NA	NA	NA	NA	NA	NA
o-Xylenes		ug/kg	NA	NA	NA	NA	NA	NA
HVOCs** (EPA 8260)								
1,2,4-Trimethylbenzene		ug/kg	NA	NA	NA	NA	NA	NA
1,3,5-Trimethylbenzene		ug/kg	NA	NA	NA	NA	NA	NA
Acetone		ug/kg	NA	NA	NA	NA	NA	NA
Ethylbenzene		ug/kg	NA	NA	NA	NA	NA	NA
Isopropylbenzene		ug/kg	NA	NA	NA	NA	NA	NA
m,p-Xylenes		ug/kg	NA	NA	NA	NA	NA	NA
Napthalene		ug/kg	NA	NA	NA	NA	NA	NA
n-Butylbenzene		ug/kg	NA	NA	NA	NA	NA	NA
o-Xylenes		ug/kg	NA	NA	NA	NA	NA	NA
para-Isopropyl Toluene		ug/kg	NA	NA	NA	NA	NA	NA
Propylbenzene		ug/kg	NA	NA	NA	NA	NA	NA
sec-Butylbenzene		ug/kg	NA	NA	NA	NA	NA	NA
Tetrachloroethene		ug/kg	NA	NA	NA	NA	NA	NA
Toluene		ug/kg	NA	NA	NA	NA	NA	NA
Trichloroethene		ug/kg	NA	NA	NA	NA	NA	NA
Semivolatile Organics** (EPA 8270)								
2-Methylnaphthalene	216,236,000	ug/kg	NA	NA	NA	NA	<150,000	NA
TITLE 26 Metals								
Antimony	1,658	mg/kg	NA	NA	NA	NA	NA	NA
Arsenic	19	mg/kg	NA	NA	NA	NA	NA	NA
Barium	290,217	mg/kg	NA	NA	NA	NA	NA	NA
Beryllium		mg/kg	NA	NA	NA	NA	NA	NA
Cadmium	2,073	mg/kg	NA	NA	NA	NA	NA	NA
Chromium (total)		mg/kg	NA	NA	NA	NA	NA	NA
Cobalt		mg/kg	NA	NA	NA	NA	NA	NA
Copper		mg/kg	NA	NA	NA	NA	NA	NA
Lead	2,464	mg/kg	NA	NA	NA	NA	NA	NA
Molybdenum		mg/kg	NA	NA	NA	NA	NA	NA
Nickel		mg/kg	NA	NA	NA	NA	NA	NA
Selenium		mg/kg	NA	NA	NA	NA	NA	NA
Silver	90,603	mg/kg	NA	NA	NA	NA	NA	NA
Thallium		mg/kg	NA	NA	NA	NA	NA	NA
Vanadium		mg/kg	NA	NA	NA	NA	NA	NA
Zinc		mg/kg	NA	NA	NA	NA	NA	NA
Mercury (EPA 7470)		mg/kg	NA	NA	NA	NA	NA	NA
Lead (STLC - EPA 6010B)		ug/L	NA	NA	NA	NA	NA	NA
Other								
Herbicides (EPA 8151A)		ug/kg	ND	NA	NA	NA	NA	NA
Pesticides/PCBs (EPA 8081A/8082)		ug/kg	ND	NA	NA	NA	NA	NA
96 hour LC50 Bioassay			NA	NA	NA	NA	NA	NA

Notes:

*RAO = Soil Remedial Action Objective is listed for Base Case only is for Commercial Maintenance Worker (see Table 1).

Bold entry indicates exceedence of Base Case RAO.

**Only compounds with detections above reporting limits are listed for VOCs and SVOCs.

NA - Not analyzed or not applicable.

NS - Elevation not surveyed; see report for coordinates.

NR - No recovery.

ug/kg - micrograms per kilogram

mg/kg - milligrams per kilogram

< less than (not detected at or above this value)

Y - sample exhibits pattern which does not resemble standard

H - heavier hydrocarbons than indicated on standard

L - lighter hydrocarbons than indicated on standard

J - estimated value

Table 2
Soil Investigation Results
May to June 2000
Southern Area, Former Bayshore Railyard (OU-2)
Brisbane, California
Sunquest Properties, Inc.

Sample Name Ground Surface Elevation Bay Mud Depth Sample Depth (ft) Sampling Date Laboratory Episode Number	*RAO* Base Case (Commercial Maint. Worker)*		R-16B_SC NS 10.7 10.0 - 10.5 6/2/00 145956-003	R-17 8.00 (Free product at ground surface; not drilled.)	R-18 8.42 (Free product at ground surface; not drilled.)	R-19A_SC NS 7.7 2.0 - 2.5 6/2/00 145942-010	R-19B_SC NS 7.7 7.0 - 7.7 6/2/00 145942-011
Parameter		Units					
Total Volatile Hydrocarbons							
Gasoline Range		mg/kg	NA	NA	NA	<1	NA
Stoddard Solvent Range		mg/kg	NA	NA	NA	<5	NA
Total Extractable Hydrocarbons							
Diesel Range	*46,000*	mg/kg	16,300	NA	NA	NA	30,700
Motor Oil Range		mg/kg	24,200	NA	NA	NA	50,700
Bunker C Range	*46,000*	mg/kg	71,200	NA	NA	NA	**140,000**
VOCs (EPA 8021)							
Benzene		ug/kg	NA	NA	NA	NA	NA
Toluene		ug/kg	NA	NA	NA	NA	NA
Ethylbenzene		ug/kg	NA	NA	NA	NA	NA
m,p-Xylenes		ug/kg	NA	NA	NA	NA	NA
o-Xylenes		ug/kg	NA	NA	NA	NA	NA
HVOCs** (EPA 8260)							
1,2,4-Trimethylbenzene		ug/kg	NA	NA	NA	<5.1	NA
1,3,5-Trimethylbenzene		ug/kg	NA	NA	NA	<5.1	NA
Acetone		ug/kg	NA	NA	NA	<20	NA
Ethylbenzene		ug/kg	NA	NA	NA	<5.1	NA
Isopropylbenzene		ug/kg	NA	NA	NA	<5.1	NA
m,p-Xylenes		ug/kg	NA	NA	NA	<5.1	NA
Napthalene		ug/kg	NA	NA	NA	<5.1	NA
n-Butylbenzene		ug/kg	NA	NA	NA	<5.1	NA
o-Xylenes		ug/kg	NA	NA	NA	<5.1	NA
para-Isopropyl Toluene		ug/kg	NA	NA	NA	<5.1	NA
Propylbenzene		ug/kg	NA	NA	NA	<5.1	NA
sec-Butylbenzene		ug/kg	NA	NA	NA	<5.1	NA
Tetrachloroethene		ug/kg	NA	NA	NA	<5.1	NA
Toluene		ug/kg	NA	NA	NA	<5.1	NA
Trichloroethene		ug/kg	NA	NA	NA	<5.1	NA
Semivolatile Organics** (EPA 8270)							
2-Methylnaphthalene	*216,236,000*	ug/kg	NA	NA	NA	NA	NA
TITLE 26 Metals							
Antimony	*1,658*	mg/kg	NA	NA	NA	NA	NA
Arsenic	*19*	mg/kg	NA	NA	NA	NA	NA
Barium	*290,217*	mg/kg	NA	NA	NA	NA	NA
Beryllium		mg/kg	NA	NA	NA	NA	NA
Cadmium	*2,073*	mg/kg	NA	NA	NA	NA	NA
Chromium (total)		mg/kg	NA	NA	NA	NA	NA
Cobalt		mg/kg	NA	NA	NA	NA	NA
Copper		mg/kg	NA	NA	NA	NA	NA
Lead	*2,464*	mg/kg	NA	NA	NA	NA	NA
Molybdenum		mg/kg	NA	NA	NA	NA	NA
Nickel		mg/kg	NA	NA	NA	NA	NA
Selenium		mg/kg	NA	NA	NA	NA	NA
Silver	*90,603*	mg/kg	NA	NA	NA	NA	NA
Thallium		mg/kg	NA	NA	NA	NA	NA
Vanadium		mg/kg	NA	NA	NA	NA	NA
Zinc		mg/kg	NA	NA	NA	NA	NA
Mercury (EPA 7470)		mg/kg	NA	NA	NA	NA	NA
Lead (STLC - EPA 6010B)		ug/L	NA	NA	NA	NA	NA
Other							
Herbicides (EPA 8151A)		ug/kg	NA	NA	NA	NA	NA
Pesticides/PCBs (EPA 8081A/8082)		ug/kg	NA	NA	NA	NA	NA
96 hour LC50 Bioassay			NA	NA	NA	NA	NA

Notes:
*RAO = Soil Remedial Action Objective is listed for Base Case only is for Commercial Maintenance Worker (see Table 1).
Bold entry indicates exceedence of Base Case RAO.
**Only compounds with detections above reporting limits are listed for VOCs and SVOCs.
NA - Not analyzed or not applicable.
NS - Elevation not surveyed; see report for coordinates.
NR - No recovery.
ug/kg - micrograms per kilogram
mg/kg - milligrams per kilogram
< less than (not detected at or above this value)
Y - sample exhibits pattern which does not resemble standard
H - heavier hydrocarbons than indicated on standard
L - lighter hydrocarbons than indicated on standard
J - estimated value

Table 2
Soil Investigation Results
May to June 2000
Southern Area, Former Bayshore Railyard (OU-2)
Brisbane, California
Sunquest Properties, Inc.

Sample Name Ground Surface Elevation Bay Mud Depth Sample Depth (ft) Sampling Date Laboratory Episode Number	*RAO* Base Case (Commercial Maint. Worker)*	Units	R-20 NS (Free product at ground surface; not drilled.)	R-21 NS (Free product at ground surface; not drilled.)	R-22B_SC NS 10.7 9.4 - 10.2 6/2/00 145956-004	R-23A_SC 6.10 9.2 1.4 - 2.0 6/2/00 145942-009	R-23B_SC 6.10 9.2 7.6 - 8.4 6/2/00 146015-001
Parameter							
Total Volatile Hydrocarbons							
Gasoline Range		mg/kg	NA	NA	NA	<1	NA
Stoddard Solvent Range		mg/kg	NA	NA	NA	<5.1	NA
Total Extractable Hydrocarbons							
Diesel Range	*46,000*	mg/kg	NA	NA	25,700	NA	40,600
Motor Oil Range		mg/kg	NA	NA	56,800	NA	64,000
Bunker C Range	*46,000*	mg/kg	NA	NA	126,000	NA	182,000
VOCs (EPA 8021)							
Benzene		ug/kg	NA	NA	NA	NA	NA
Toluene		ug/kg	NA	NA	NA	NA	NA
Ethylbenzene		ug/kg	NA	NA	NA	NA	NA
m,p-Xylenes		ug/kg	NA	NA	NA	NA	NA
o-Xylenes		ug/kg	NA	NA	NA	NA	NA
HVOCs** (EPA 8260)							
1,2,4-Trimethylbenzene		ug/kg	NA	NA	NA	<4.6	NA
1,3,5-Trimethylbenzene		ug/kg	NA	NA	NA	<4.6	NA
Acetone		ug/kg	NA	NA	NA	<19	NA
Ethylbenzene		ug/kg	NA	NA	NA	<4.6	NA
Isopropylbenzene		ug/kg	NA	NA	NA	<4.6	NA
m,p-Xylenes		ug/kg	NA	NA	NA	<4.6	NA
Napthalene		ug/kg	NA	NA	NA	<4.6	NA
n-Butylbenzene		ug/kg	NA	NA	NA	<4.6	NA
o-Xylenes		ug/kg	NA	NA	NA	<4.6	NA
para-Isopropyl Toluene		ug/kg	NA	NA	NA	<4.6	NA
Propylbenzene		ug/kg	NA	NA	NA	<4.6	NA
sec-Butylbenzene		ug/kg	NA	NA	NA	<4.6	NA
Tetrachloroethene		ug/kg	NA	NA	NA	<4.6	NA
Toluene		ug/kg	NA	NA	NA	<4.6	NA
Trichloroethene		ug/kg	NA	NA	NA	<4.6	NA
Semivolatile Organics** (EPA 8270)							
2-Methylnaphthalene	*216,236,000*	ug/kg	NA	NA	<67,000	NA	NA
TITLE 26 Metals							
Antimony	*1,658*	mg/kg	NA	NA	NA	NA	NA
Arsenic	*19*	mg/kg	NA	NA	NA	NA	NA
Barium	*290,217*	mg/kg	NA	NA	NA	NA	NA
Beryllium		mg/kg	NA	NA	NA	NA	NA
Cadmium	*2,073*	mg/kg	NA	NA	NA	NA	NA
Chromium (total)		mg/kg	NA	NA	NA	NA	NA
Cobalt		mg/kg	NA	NA	NA	NA	NA
Copper		mg/kg	NA	NA	NA	NA	NA
Lead	*2,464*	mg/kg	NA	NA	NA	NA	NA
Molybdenum		mg/kg	NA	NA	NA	NA	NA
Nickel		mg/kg	NA	NA	NA	NA	NA
Selenium		mg/kg	NA	NA	NA	NA	NA
Silver	*90,603*	mg/kg	NA	NA	NA	NA	NA
Thallium		mg/kg	NA	NA	NA	NA	NA
Vanadium		mg/kg	NA	NA	NA	NA	NA
Zinc		mg/kg	NA	NA	NA	NA	NA
Mercury (EPA 7470)		mg/kg	NA	NA	NA	NA	NA
Lead (STLC - EPA 6010B)		ug/L	NA	NA	NA	NA	NA
Other							
Herbicides (EPA 8151A)		ug/kg	NA	NA	NA	NA	NA
Pesticides/PCBs (EPA 8081A/8082)		ug/kg	NA	NA	NA	NA	NA
96 hour LC50 Bioassay			NA	NA	NA	NA	NA

Notes:

*RAO = Soil Remedial Action Objective is listed for Base Case only is for Commercial Maintenance Worker (see Table 1).

Bold entry indicates exceedence of Base Case RAO.

**Only compounds with detections above reporting limits are listed for VOCs and SVOCs.

NA - Not analyzed or not applicable.

NS - Elevation not surveyed; see report for coordinates.

NR - No recovery.

ug/kg - micrograms per kilogram

mg/kg - milligrams per kilogram

< less than (not detected at or above this value)

Y - sample exhibits pattern which does not resemble standard

H - heavier hydrocarbons than indicated on standard

L - lighter hydrocarbons than indicated on standard

J - estimated value

Table 2
Soil Investigation Results
May to June 2000
Southern Area, Former Bayshore Railyard (OU-2)
Brisbane, California
Sunquest Properties, Inc.

Sample Name			R-24_SC	R-25A_SC	R-25B_SC	R-26_SC	R-27B_SC
Ground Surface Elevation			NS	6.15	6.15	NS	6.12
Bay Mud Depth	RAO*		8-12 (NR)	7.1	7.1	9.8	8-12 (NR)
Sample Depth (ft)	Base Case		6.0 - 6.5	3.2 - 3.7	6.5 - 7.0	9.0 - 9.8	7.4 - 8.0
Sampling Date	(Commercial		6/2/00	6/6/00	6/6/00	6/1/00	6/2/00
Laboratory Episode Number	Maint. Worker)		145942-008	146015-002	146015-003	145942-007	145956-005
Parameter		Units					
Total Volatile Hydrocarbons							
Gasoline Range		mg/kg	NA	1100YZ	NA	NA	NA
Stoddard Solvent Range		mg/kg	NA	520YZ	NA	NA	NA
Total Extractable Hydrocarbons							
Diesel Range	46,000	mg/kg	7,590	NA	15,000	**67,000**	89
Motor Oil Range		mg/kg	12,300	NA	29,500	**113,000**	158
Bunker C Range	46,000	mg/kg	34,700	NA	73,400	**299,000**	387
VOCs (EPA 8021)							
Benzene		ug/kg	NA	NA	NA	NA	NA
Toluene		ug/kg	NA	NA	NA	NA	NA
Ethylbenzene		ug/kg	NA	NA	NA	NA	NA
m,p-Xylenes		ug/kg	NA	NA	NA	NA	NA
o-Xylenes		ug/kg	NA	NA	NA	NA	NA
HVOCs** (EPA 8260)							
1,2,4-Trimethylbenzene		ug/kg	NA	<130,000	NA	NA	NA
1,3,5-Trimethylbenzene		ug/kg	NA	<130,000	NA	NA	NA
Acetone		ug/kg	NA	<500,000	NA	NA	NA
Ethylbenzene		ug/kg	NA	<130,000	NA	NA	NA
Isopropylbenzene		ug/kg	NA	<130,000	NA	NA	NA
m,p-Xylenes		ug/kg	NA	<130,000	NA	NA	NA
Napthalene		ug/kg	NA	<130,000	NA	NA	NA
n-Butylbenzene		ug/kg	NA	<130,000	NA	NA	NA
o-Xylenes		ug/kg	NA	<130,000	NA	NA	NA
para-Isopropyl Toluene		ug/kg	NA	<130,000	NA	NA	NA
Propylbenzene		ug/kg	NA	<130,000	NA	NA	NA
sec-Butylbenzene		ug/kg	NA	<130,000	NA	NA	NA
Tetrachloroethene		ug/kg	NA	2,500,000	NA	NA	NA
Toluene		ug/kg	NA	<130,000	NA	NA	NA
Trichloroethene		ug/kg	NA	170,000	NA	NA	NA
Semivolatile Organics** (EPA 8270)							
2-Methylnaphthalene	216,236,000	ug/kg	NA	NA	NA	15000J	NA
TITLE 26 Metals							
Antimony	1,658	mg/kg	NA	NA	NA	NA	NA
Arsenic	19	mg/kg	NA	NA	NA	NA	NA
Barium	290,217	mg/kg	NA	NA	NA	NA	NA
Beryllium		mg/kg	NA	NA	NA	NA	NA
Cadmium	2,073	mg/kg	NA	NA	NA	NA	NA
Chromium (total)		mg/kg	NA	NA	NA	NA	NA
Cobalt		mg/kg	NA	NA	NA	NA	NA
Copper		mg/kg	NA	NA	NA	NA	NA
Lead	2,464	mg/kg	NA	NA	NA	NA	NA
Molybdenum		mg/kg	NA	NA	NA	NA	NA
Nickel		mg/kg	NA	NA	NA	NA	NA
Selenium		mg/kg	NA	NA	NA	NA	NA
Silver	90,603	mg/kg	NA	NA	NA	NA	NA
Thallium		mg/kg	NA	NA	NA	NA	NA
Vanadium		mg/kg	NA	NA	NA	NA	NA
Zinc		mg/kg	NA	NA	NA	NA	NA
Mercury (EPA 7470)		mg/kg	NA	NA	NA	NA	NA
Lead (STLC - EPA 6010B)		ug/L	NA	NA	NA	NA	NA
Other							
Herbicides (EPA 8151A)		ug/kg	NA	NA	NA	NA	NA
Pesticides/PCBs (EPA 8081A/8082)		ug/kg	NA	NA	NA	NA	NA
96 hour LC50 Bioassay			NA	NA	NA	NA	NA

Notes:
*RAO = Soil Remedial Action Objective is listed for Base Case only
is for Commercial Maintenance Worker (see Table 1).
Bold entry indicates exceedence of Base Case RAO.
**Only compounds with detections above reporting limits
are listed for VOCs and SVOCs.
NA - Not analyzed or not applicable.
NS - Elevation not surveyed; see report for coordinates.
NR - No recovery.
ug/kg - micrograms per kilogram
mg/kg - milligrams per kilogram
< less than (not detected at or above this value)
Y - sample exhibits pattern which does not resemble standard
H - heavier hydrocarbons than indicated on standard
L - lighter hydrocarbons than indicated on standard
J - estimated value

Table 2
Soil Investigation Results
May to June 2000
Southern Area, Former Bayshore Railyard (OU-2)
Brisbane, California
Sunquest Properties, Inc.

Sample Name			R-28B_SC	R-29_SC	R-30A_SC	R-30B_SC	R-31B_SC
Ground Surface Elevation			NS	NS	6.78	6.78	NS
Bay Mud Depth			10	10.3	12-14 (NR)	12-14 (NR)	9.3
Sample Depth (ft)	RAO*		9.5 - 10.0	9.5 - 10.5	2.2 - 3.0	7.0 - 8.0	9.0 - 9.4
Sampling Date	Base Case		5/31/00	5/31/00	6/1/00	6/1/00	5/31/00
Laboratory Episode Number	(Commercial Maint. Worker)		145938-001	145956-011	145938-018	145938-019	145956-006
Parameter		Units					
Total Volatile Hydrocarbons							
Gasoline Range		mg/kg	NA	NA	380HY	NA	NA
Stoddard Solvent Range		mg/kg	NA	NA	190Y	NA	NA
Total Extractable Hydrocarbons							
Diesel Range	46,000	mg/kg	832	1,190	NA	16,100	22
Motor Oil Range		mg/kg	1,890	2,940	NA	6,200	52
Bunker C Range	46,000	mg/kg	4,210	5,880	NA	57,100	119
VOCs (EPA 8021)							
Benzene		ug/kg	NA	NA	NA	NA	NA
Toluene		ug/kg	NA	NA	NA	NA	NA
Ethylbenzene		ug/kg	NA	NA	NA	NA	NA
m,p-Xylenes		ug/kg	NA	NA	NA	NA	NA
o-Xylenes		ug/kg	NA	NA	NA	NA	NA
HVOCs** (EPA 8260)							
1,2,4-Trimethylbenzene		ug/kg	NA	NA	100J	NA	NA
1,3,5-Trimethylbenzene		ug/kg	NA	NA	<130	NA	NA
Acetone		ug/kg	NA	NA	<500	NA	NA
Ethylbenzene		ug/kg	NA	NA	<130	NA	NA
Isopropylbenzene		ug/kg	NA	NA	320	NA	NA
m,p-Xylenes		ug/kg	NA	NA	<130	NA	NA
Napthalene		ug/kg	NA	NA	1,700	NA	NA
n-Butylbenzene		ug/kg	NA	NA	1,500	NA	NA
o-Xylenes		ug/kg	NA	NA	<130	NA	NA
para-Isopropyl Toluene		ug/kg	NA	NA	330	NA	NA
Propylbenzene		ug/kg	NA	NA	780	NA	NA
sec-Butylbenzene		ug/kg	NA	NA	780	NA	NA
Tetrachloroethene		ug/kg	NA	NA	<130	NA	NA
Toluene		ug/kg	NA	NA	<130	NA	NA
Trichloroethene		ug/kg	NA	NA	<130	NA	NA
Semivolatile Organics** (EPA 8270)							
2-Methylnaphthalene	216,236,000	ug/kg	NA	<17,000	NA	NA	NA
TITLE 26 Metals							
Antimony	1,658	mg/kg	NA	NA	NA	NA	NA
Arsenic	19	mg/kg	NA	NA	NA	NA	NA
Barium	290,217	mg/kg	NA	NA	NA	NA	NA
Beryllium		mg/kg	NA	NA	NA	NA	NA
Cadmium	2,073	mg/kg	NA	NA	NA	NA	NA
Chromium (total)		mg/kg	NA	NA	NA	NA	NA
Cobalt		mg/kg	NA	NA	NA	NA	NA
Copper		mg/kg	NA	NA	NA	NA	NA
Lead	2,464	mg/kg	NA	NA	NA	NA	NA
Molybdenum		mg/kg	NA	NA	NA	NA	NA
Nickel		mg/kg	NA	NA	NA	NA	NA
Selenium		mg/kg	NA	NA	NA	NA	NA
Silver	90,603	mg/kg	NA	NA	NA	NA	NA
Thallium		mg/kg	NA	NA	NA	NA	NA
Vanadium		mg/kg	NA	NA	NA	NA	NA
Zinc		mg/kg	NA	NA	NA	NA	NA
Mercury (EPA 7470)		mg/kg	NA	NA	NA	NA	NA
Lead (STLC - EPA 6010B)		ug/L	NA	NA	NA	NA	NA
Other							
Herbicides (EPA 8151A)		ug/kg	NA	NA	NA	NA	NA
Pesticides/PCBs (EPA 8081A/8082)		ug/kg	NA	NA	NA	NA	NA
96 hour LC50 Bioassay			NA	NA	NA	NA	NA

Notes:

*RAO = Soil Remedial Action Objective is listed for Base Case only
is for Commercial Maintenance Worker (see Table 1).

Bold entry indicates exceedence of Base Case RAO.

**Only compounds with detections above reporting limits
are listed for VOCs and SVOCs.

NA - Not analyzed or not applicable.

NS - Elevation not surveyed; see report for coordinates.

NR - No recovery.

ug/kg - micrograms per kilogram

mg/kg - milligrams per kilogram

< less than (not detected at or above this value)

Y - sample exhibits pattern which does not resemble standard

H - heavier hydrocarbons than indicated on standard

L - lighter hydrocarbons than indicated on standard

J - estimated value

Table 2
Soil Investigation Results
May to June 2000
Southern Area, Former Bayshore Railyard (OU-2)
Brisbane, California
Sunquest Properties, Inc.

Sample Name			R-32C_SC	R-33B_SC	R-34	R-35B_SC	R-36C_SC
Ground Surface Elevation			7.97	NS	8.73	9.27	NS
Bay Mud Depth	RAO*		11.4	10.3	Refusal 4.5	9.3	12.8
Sample Depth (ft)	Base Case		11.0 - 11.5	9.8 - 10.3	NA	5.0 - 5.5	12.3 - 12.8
Sampling Date	(Commercial		5/31/00	5/31/00	5/31/00	5/31/00	5/31/00
Laboratory Episode Number	Maint. Worker)		145938-003	145938-004	NA	145938-005	145938-006
Parameter		Units					
Total Volatile Hydrocarbons							
Gasoline Range		mg/kg	NA	NA	NA	NA	NA
Stoddard Solvent Range		mg/kg	NA	NA	NA	NA	NA
Total Extractable Hydrocarbons							
Diesel Range	46,000	mg/kg	316	4,310	NA	5,980	1,520
Motor Oil Range		mg/kg	503	8,790	NA	13,500	5,430
Bunker C Range	46,000	mg/kg	1,410	20,800	NA	30,800	8,530
VOCs (EPA 8021)							
Benzene		ug/kg	NA	NA	NA	NA	NA
Toluene		ug/kg	NA	NA	NA	NA	NA
Ethylbenzene		ug/kg	NA	NA	NA	NA	NA
m,p-Xylenes		ug/kg	NA	NA	NA	NA	NA
o-Xylenes		ug/kg	NA	NA	NA	NA	NA
HVOCs** (EPA 8260)							
1,2,4-Trimethylbenzene		ug/kg	NA	NA	NA	NA	NA
1,3,5-Trimethylbenzene		ug/kg	NA	NA	NA	NA	NA
Acetone		ug/kg	NA	NA	NA	NA	NA
Ethylbenzene		ug/kg	NA	NA	NA	NA	NA
Isopropylbenzene		ug/kg	NA	NA	NA	NA	NA
m,p-Xylenes		ug/kg	NA	NA	NA	NA	NA
Napthalene		ug/kg	NA	NA	NA	NA	NA
n-Butylbenzene		ug/kg	NA	NA	NA	NA	NA
o-Xylenes		ug/kg	NA	NA	NA	NA	NA
para-Isopropyl Toluene		ug/kg	NA	NA	NA	NA	NA
Propylbenzene		ug/kg	NA	NA	NA	NA	NA
sec-Butylbenzene		ug/kg	NA	NA	NA	NA	NA
Tetrachloroethene		ug/kg	NA	NA	NA	NA	NA
Toluene		ug/kg	NA	NA	NA	NA	NA
Trichloroethene		ug/kg	NA	NA	NA	NA	NA
Semivolatile Organics** (EPA 8270)							
2-Methylnaphthalene	216,236,000	ug/kg	<3,400	<23,000	NA	NA	NA
TITLE 26 Metals							
Antimony	1,658	mg/kg	NA	NA	NA	NA	NA
Arsenic	19	mg/kg	NA	NA	NA	NA	NA
Barium	290,217	mg/kg	NA	NA	NA	NA	NA
Beryllium		mg/kg	NA	NA	NA	NA	NA
Cadmium	2,073	mg/kg	NA	NA	NA	NA	NA
Chromium (total)		mg/kg	NA	NA	NA	NA	NA
Cobalt		mg/kg	NA	NA	NA	NA	NA
Copper		mg/kg	NA	NA	NA	NA	NA
Lead	2,464	mg/kg	NA	NA	NA	NA	NA
Molybdenum		mg/kg	NA	NA	NA	NA	NA
Nickel		mg/kg	NA	NA	NA	NA	NA
Selenium		mg/kg	NA	NA	NA	NA	NA
Silver	90,603	mg/kg	NA	NA	NA	NA	NA
Thallium		mg/kg	NA	NA	NA	NA	NA
Vanadium		mg/kg	NA	NA	NA	NA	NA
Zinc		mg/kg	NA	NA	NA	NA	NA
Mercury (EPA 7470)		mg/kg	NA	NA	NA	NA	NA
Lead (STLC - EPA 6010B)		ug/L	NA	NA	NA	NA	NA
Other							
Herbicides (EPA 8151A)		ug/kg	NA	NA	NA	NA	NA
Pesticides/PCBs (EPA 8081A/8082)		ug/kg	NA	NA	NA	NA	NA
96 hour LC50 Bioassay			NA	NA	NA	NA	NA

Notes:
*RAO = Soil Remedial Action Objective is listed for Base Case only is for Commercial Maintenance Worker (see Table 1).
Bold entry indicates exceedence of Base Case RAO.
**Only compounds with detections above reporting limits are listed for VOCs and SVOCs.
NA - Not analyzed or not applicable.
NS - Elevation not surveyed; see report for coordinates.
NR - No recovery.
ug/kg - micrograms per kilogram
mg/kg - milligrams per kilogram
< less than (not detected at or above this value)
Y - sample exhibits pattern which does not resemble standard
H - heavier hydrocarbons than indicated on standard
L - lighter hydrocarbons than indicated on standard
J - estimated value

Table 2
Soil Investigation Results
May to June 2000
Southern Area, Former Bayshore Railyard (OU-2)
Brisbane, California
Sunquest Properties, Inc.

Sample Name			R-37B_SC	R-38_SC	R-39	R-40_SC	R-41
Ground Surface Elevation			NS	9.20	NS	NS	NS
Bay Mud Depth	RAO*		8	8-12 (NR)	7.4	9.1	Refusal 9.5
Sample Depth (ft)	Base Case		6.0 - 6.5	5.0 - 5.5	NA	7.0 - 7.5	NA
Sampling Date	(Commercial		5/31/00	5/30/00	5/30/00	5/30/00	5/30/00
Laboratory Episode Number	Maint. Worker)		145938-007	145938-008	NA	145880-01	NA
Parameter		Units					
Total Volatile Hydrocarbons							
Gasoline Range		mg/kg	NA	NA	NA	NA	NA
Stoddard Solvent Range		mg/kg	NA	NA	NA	NA	NA
Total Extractable Hydrocarbons							
Diesel Range	46,000	mg/kg	9,790	2,300	NA	474	NA
Motor Oil Range		mg/kg	1,700	4,880	NA	2,030	NA
Bunker C Range	46,000	mg/kg	31,800	11,100	NA	2,800	NA
VOCs (EPA 8021)							
Benzene		ug/kg	NA	NA	NA	NA	NA
Toluene		ug/kg	NA	NA	NA	NA	NA
Ethylbenzene		ug/kg	NA	NA	NA	NA	NA
m,p-Xylenes		ug/kg	NA	NA	NA	NA	NA
o-Xylenes		ug/kg	NA	NA	NA	NA	NA
HVOCs** (EPA 8260)							
1,2,4-Trimethylbenzene		ug/kg	NA	NA	NA	NA	NA
1,3,5-Trimethylbenzene		ug/kg	NA	NA	NA	NA	NA
Acetone		ug/kg	NA	NA	NA	NA	NA
Ethylbenzene		ug/kg	NA	NA	NA	NA	NA
Isopropylbenzene		ug/kg	NA	NA	NA	NA	NA
m,p-Xylenes		ug/kg	NA	NA	NA	NA	NA
Napthalene		ug/kg	NA	NA	NA	NA	NA
n-Butylbenzene		ug/kg	NA	NA	NA	NA	NA
o-Xylenes		ug/kg	NA	NA	NA	NA	NA
para-Isopropyl Toluene		ug/kg	NA	NA	NA	NA	NA
Propylbenzene		ug/kg	NA	NA	NA	NA	NA
sec-Butylbenzene		ug/kg	NA	NA	NA	NA	NA
Tetrachloroethene		ug/kg	NA	NA	NA	NA	NA
Toluene		ug/kg	NA	NA	NA	NA	NA
Trichloroethene		ug/kg	NA	NA	NA	NA	NA
Semivolatile Organics** (EPA 8270)							
2-Methylnaphthalene	216,236,000	ug/kg	NA	NA	NA	<17,000	NA
TITLE 26 Metals							
Antimony	1,658	mg/kg	NA	NA	NA	<2.9	NA
Arsenic	19	mg/kg	NA	NA	NA	9.3	NA
Barium	290,217	mg/kg	NA	NA	NA	38.0	NA
Beryllium		mg/kg	NA	NA	NA	0.5	NA
Cadmium	2,073	mg/kg	NA	NA	NA	2.4	NA
Chromium (total)		mg/kg	NA	NA	NA	20.0	NA
Cobalt		mg/kg	NA	NA	NA	13.0	NA
Copper		mg/kg	NA	NA	NA	37.0	NA
Lead	2,464	mg/kg	NA	NA	NA	51.0	NA
Molybdenum		mg/kg	NA	NA	NA	<0.98	NA
Nickel		mg/kg	NA	NA	NA	34.0	NA
Selenium		mg/kg	NA	NA	NA	<0.25	NA
Silver	90,603	mg/kg	NA	NA	NA	<0.25	NA
Thallium		mg/kg	NA	NA	NA	0.6	NA
Vanadium		mg/kg	NA	NA	NA	27.0	NA
Zinc		mg/kg	NA	NA	NA	62.0	NA
Mercury (EPA 7470)		mg/kg	NA	NA	NA	0.1	NA
Lead (STLC - EPA 6010B)		ug/L	NA	NA	NA	NA	NA
Other							
Herbicides (EPA 8151A)		ug/kg	NA	NA	NA	NA	NA
Pesticides/PCBs (EPA 8081A/8082)		ug/kg	NA	NA	NA	NA	NA
96 hour LC50 Bioassay			NA	NA	NA	PASS	NA

Notes:

*RAO = Soil Remedial Action Objective is listed for Base Case only is for Commercial Maintenance Worker (see Table 1).

Bold entry indicates exceedence of Base Case RAO.

**Only compounds with detections above reporting limits are listed for VOCs and SVOCs.

NA - Not analyzed or not applicable.

NS - Elevation not surveyed; see report for coordinates.

NR - No recovery.

ug/kg - micrograms per kilogram

mg/kg - milligrams per kilogram

< less than (not detected at or above this value)

Y - sample exhibits pattern which does not resemble standard

H - heavier hydrocarbons than indicated on standard

L - lighter hydrocarbons than indicated on standard

J - estimated value

Table 2
Soil Investigation Results
May to June 2000
Southern Area, Former Bayshore Railyard (OU-2)
Brisbane, California
Sunquest Properties, Inc.

Sample Name			R-42	R-45_SC	R-46	R-47	R-48A_SC
Ground Surface Elevation			NS	7.32	9.10	8.90	9.15
Bay Mud Depth	RAO*		11	8.4	9.6	9.5	9
Sample Depth (ft)	Base Case		NA	7.8 - 8.4	NA	NA	5.5 - 6.0
Sampling Date	(Commercial		5/30/00	6/2/00	5/30/00	5/30/01	5/30/00
Laboratory Episode Number	Maint. Worker)		NA	145942-012	NA	NA	145880-02
Parameter		Units					
Total Volatile Hydrocarbons							
Gasoline Range		mg/kg	NA	NA	NA	NA	NA
Stoddard Solvent Range		mg/kg	NA	NA	NA	NA	NA
Total Extractable Hydrocarbons							
Diesel Range	46,000	mg/kg	NA	19,400	NA	NA	56
Motor Oil Range		mg/kg	NA	27,400	NA	NA	154
Bunker C Range	46,000	mg/kg	NA	90,600	NA	NA	308
VOCs (EPA 8021)							
Benzene		ug/kg	NA	NA	NA	NA	NA
Toluene		ug/kg	NA	NA	NA	NA	NA
Ethylbenzene		ug/kg	NA	NA	NA	NA	NA
m,p-Xylenes		ug/kg	NA	NA	NA	NA	NA
o-Xylenes		ug/kg	NA	NA	NA	NA	NA
HVOCs** (EPA 8260)							
1,2,4-Trimethylbenzene		ug/kg	NA	NA	NA	NA	NA
1,3,5-Trimethylbenzene		ug/kg	NA	NA	NA	NA	NA
Acetone		ug/kg	NA	NA	NA	NA	NA
Ethylbenzene		ug/kg	NA	NA	NA	NA	NA
Isopropylbenzene		ug/kg	NA	NA	NA	NA	NA
m,p-Xylenes		ug/kg	NA	NA	NA	NA	NA
Napthalene		ug/kg	NA	NA	NA	NA	NA
n-Butylbenzene		ug/kg	NA	NA	NA	NA	NA
o-Xylenes		ug/kg	NA	NA	NA	NA	NA
para-Isopropyl Toluene		ug/kg	NA	NA	NA	NA	NA
Propylbenzene		ug/kg	NA	NA	NA	NA	NA
sec-Butylbenzene		ug/kg	NA	NA	NA	NA	NA
Tetrachloroethene		ug/kg	NA	NA	NA	NA	NA
Toluene		ug/kg	NA	NA	NA	NA	NA
Trichloroethene		ug/kg	NA	NA	NA	NA	NA
Semivolatile Organics** (EPA 8270)							
2-Methylnaphthalene	216,236,000	ug/kg	NA	NA	NA	NA	NA
TITLE 26 Metals							
Antimony	1,658	mg/kg	NA	NA	NA	NA	NA
Arsenic	19	mg/kg	NA	NA	NA	NA	NA
Barium	290,217	mg/kg	NA	NA	NA	NA	NA
Beryllium		mg/kg	NA	NA	NA	NA	NA
Cadmium	2,073	mg/kg	NA	NA	NA	NA	NA
Chromium (total)		mg/kg	NA	NA	NA	NA	NA
Cobalt		mg/kg	NA	NA	NA	NA	NA
Copper		mg/kg	NA	NA	NA	NA	NA
Lead	2,464	mg/kg	NA	NA	NA	NA	NA
Molybdenum		mg/kg	NA	NA	NA	NA	NA
Nickel		mg/kg	NA	NA	NA	NA	NA
Selenium		mg/kg	NA	NA	NA	NA	NA
Silver	90,603	mg/kg	NA	NA	NA	NA	NA
Thallium		mg/kg	NA	NA	NA	NA	NA
Vanadium		mg/kg	NA	NA	NA	NA	NA
Zinc		mg/kg	NA	NA	NA	NA	NA
Mercury (EPA 7470)		mg/kg	NA	NA	NA	NA	NA
Lead (STLC - EPA 6010B)		ug/L	NA	NA	NA	NA	NA
Other							
Herbicides (EPA 8151A)		ug/kg	NA	NA	NA	NA	NA
Pesticides/PCBs (EPA 8081A/8082)		ug/kg	NA	NA	NA	NA	NA
96 hour LC50 Bioassay			NA	NA	NA	NA	NA

Notes:

*RAO = Soil Remedial Action Objective is listed for Base Case only
Is for Commercial Maintenance Worker (see Table 1).

Bold entry indicates exceedence of Base Case RAO.

**Only compounds with detections above reporting limits
are listed for VOCs and SVOCs.

NA - Not analyzed or not applicable.

NS - Elevation not surveyed; see report for coordinates.

NR - No recovery.

ug/kg - micrograms per kilogram

mg/kg - milligrams per kilogram

< less than (not detected at or above this value)

Y - sample exhibits pattern which does not resemble standard

H - heavier hydrocarbons than indicated on standard

L - lighter hydrocarbons than indicated on standard

J - estimated value

Table 2
Soil Investigation Results
May to June 2000
Southern Area, Former Bayshore Railyard (OU-2)
Brisbane, California
Sunquest Properties, Inc.

Sample Name			R-48B_SC	R-49_SC	R-50_SC	R-51_SC	R-52_SC
Ground Surface Elevation			9.15	8.68	8.93	8.90	9.30
Bay Mud Depth	RAO*		9	8	8-12 (NR)	9	9.5
Sample Depth (ft)	Base Case		8.5 - 9.0	5.5 - 6.0	5.0 - 5.5	8.5 - 9.0	4.5 - 5.0
Sampling Date	(Commercial		5/30/00	5/30/00	5/30/00	5/30/00	5/30/00
Laboratory Episode Number	Maint. Worker)		145880-001	145938-009	145938-010	145938-011	145938-012
Parameter		Units					
Total Volatile Hydrocarbons							
Gasoline Range		mg/kg	NA	NA	NA	NA	NA
Stoddard Solvent Range		mg/kg	NA	NA	NA	NA	NA
Total Extractable Hydrocarbons							
Diesel Range	46,000	mg/kg	23	3,420	2,070	1,060	1,130
Motor Oil Range		mg/kg	89	10,200	7,170	3,220	1,940
Bunker C Range	46,000	mg/kg	134	18,500	12,500	5,860	5,150
VOCs (EPA 8021)							
Benzene		ug/kg	NA	NA	NA	NA	NA
Toluene		ug/kg	NA	NA	NA	NA	NA
Ethylbenzene		ug/kg	NA	NA	NA	NA	NA
m,p-Xylenes		ug/kg	NA	NA	NA	NA	NA
o-Xylenes		ug/kg	NA	NA	NA	NA	NA
HVOCs** (EPA 8260)							
1,2,4-Trimethylbenzene		ug/kg	NA	NA	NA	NA	NA
1,3,5-Trimethylbenzene		ug/kg	NA	NA	NA	NA	NA
Acetone		ug/kg	NA	NA	NA	NA	NA
Ethylbenzene		ug/kg	NA	NA	NA	NA	NA
Isopropylbenzene		ug/kg	NA	NA	NA	NA	NA
m,p-Xylenes		ug/kg	NA	NA	NA	NA	NA
Napthalene		ug/kg	NA	NA	NA	NA	NA
n-Butylbenzene		ug/kg	NA	NA	NA	NA	NA
o-Xylenes		ug/kg	NA	NA	NA	NA	NA
para-Isopropyl Toluene		ug/kg	NA	NA	NA	NA	NA
Propylbenzene		ug/kg	NA	NA	NA	NA	NA
sec-Butylbenzene		ug/kg	NA	NA	NA	NA	NA
Tetrachloroethene		ug/kg	NA	NA	NA	NA	NA
Toluene		ug/kg	NA	NA	NA	NA	NA
Trichloroethene		ug/kg	NA	NA	NA	NA	NA
Semivolatile Organics** (EPA 8270)							
2-Methylnaphthalene	216,236,000	ug/kg	NA	NA	NA	NA	NA
TITLE 26 Metals							
Antimony	1,658	mg/kg	NA	NA	NA	NA	NA
Arsenic	19	mg/kg	NA	NA	NA	NA	NA
Barium	290,217	mg/kg	NA	NA	NA	NA	NA
Beryllium		mg/kg	NA	NA	NA	NA	NA
Cadmium	2,073	mg/kg	NA	NA	NA	NA	NA
Chromium (total)		mg/kg	NA	NA	NA	NA	NA
Cobalt		mg/kg	NA	NA	NA	NA	NA
Copper		mg/kg	NA	NA	NA	NA	NA
Lead	2,464	mg/kg	NA	NA	NA	NA	NA
Molybdenum		mg/kg	NA	NA	NA	NA	NA
Nickel		mg/kg	NA	NA	NA	NA	NA
Selenium		mg/kg	NA	NA	NA	NA	NA
Silver	90,603	mg/kg	NA	NA	NA	NA	NA
Thallium		mg/kg	NA	NA	NA	NA	NA
Vanadium		mg/kg	NA	NA	NA	NA	NA
Zinc		mg/kg	NA	NA	NA	NA	NA
Mercury (EPA 7470)		mg/kg	NA	NA	NA	NA	NA
Lead (STLC - EPA 6010B)		ug/L	NA	NA	NA	NA	NA
Other							
Herbicides (EPA 8151A)		ug/kg	NA	NA	NA	NA	NA
Pesticides/PCBs (EPA 8081A/8082)		ug/kg	NA	NA	NA	NA	NA
96 hour LC50 Bioassay			NA	NA	NA	NA	NA

Notes:

*RAO = Soil Remedial Action Objective is listed for Base Case only is for Commercial Maintenance Worker (see Table 1).

Bold entry indicates exceedence of Base Case RAO.

**Only compounds with detections above reporting limits are listed for VOCs and SVOCs.

NA - Not analyzed or not applicable.

NS - Elevation not surveyed; see report for coordinates.

NR - No recovery.

ug/kg - micrograms per kilogram

mg/kg - milligrams per kilogram

< less than (not detected at or above this value)

Y - sample exhibits pattern which does not resemble standard

H - heavier hydrocarbons than indicated on standard

L - lighter hydrocarbons than indicated on standard

J - estimated value

Table 2
Soil Investigation Results
May to June 2000
Southern Area, Former Bayshore Railyard (OU-2)
Brisbane, California
Sunquest Properties, Inc.

Sample Name			R-53	R-54	R-55	R-56	R-57
Ground Surface Elevation			8.92	9.12	9.13	9.37	9.23
Bay Mud Depth	RAO*		8	8	7.5	7.5	6
Sample Depth (ft)	Base Case		NA	NA	NA	NA	NA
Sampling Date	(Commercial		6/5/00	6/5/00	6/5/00	6/5/00	6/5/00
Laboratory Episode Number	Maint. Worker)		NA	NA	NA	NA	NA
Parameter		Units					
Total Volatile Hydrocarbons							
Gasoline Range		mg/kg	NA	NA	NA	NA	NA
Stoddard Solvent Range		mg/kg	NA	NA	NA	NA	NA
Total Extractable Hydrocarbons							
Diesel Range	46,000	mg/kg	NA	NA	NA	NA	NA
Motor Oil Range		mg/kg	NA	NA	NA	NA	NA
Bunker C Range	46,000	mg/kg	NA	NA	NA	NA	NA
VOCs (EPA 8021)							
Benzene		ug/kg	NA	NA	NA	NA	NA
Toluene		ug/kg	NA	NA	NA	NA	NA
Ethylbenzene		ug/kg	NA	NA	NA	NA	NA
m,p-Xylenes		ug/kg	NA	NA	NA	NA	NA
o-Xylenes		ug/kg	NA	NA	NA	NA	NA
HVOCs** (EPA 8260)							
1,2,4-Trimethylbenzene		ug/kg	NA	NA	NA	NA	NA
1,3,5-Trimethylbenzene		ug/kg	NA	NA	NA	NA	NA
Acetone		ug/kg	NA	NA	NA	NA	NA
Ethylbenzene		ug/kg	NA	NA	NA	NA	NA
Isopropylbenzene		ug/kg	NA	NA	NA	NA	NA
m,p-Xylenes		ug/kg	NA	NA	NA	NA	NA
Napthalene		ug/kg	NA	NA	NA	NA	NA
n-Butylbenzene		ug/kg	NA	NA	NA	NA	NA
o-Xylenes		ug/kg	NA	NA	NA	NA	NA
para-Isopropyl Toluene		ug/kg	NA	NA	NA	NA	NA
Propylbenzene		ug/kg	NA	NA	NA	NA	NA
sec-Butylbenzene		ug/kg	NA	NA	NA	NA	NA
Tetrachloroethene		ug/kg	NA	NA	NA	NA	NA
Toluene		ug/kg	NA	NA	NA	NA	NA
Trichloroethene		ug/kg	NA	NA	NA	NA	NA
Semivolatile Organics** (EPA 8270)							
2-Methylnaphthalene	216,236,000	ug/kg	NA	NA	NA	NA	NA
TITLE 26 Metals							
Antimony	1,658	mg/kg	NA	NA	NA	NA	NA
Arsenic	19	mg/kg	NA	NA	NA	NA	NA
Barium	290,217	mg/kg	NA	NA	NA	NA	NA
Beryllium		mg/kg	NA	NA	NA	NA	NA
Cadmium	2,073	mg/kg	NA	NA	NA	NA	NA
Chromium (total)		mg/kg	NA	NA	NA	NA	NA
Cobalt		mg/kg	NA	NA	NA	NA	NA
Copper		mg/kg	NA	NA	NA	NA	NA
Lead	2,464	mg/kg	NA	NA	NA	NA	NA
Molybdenum		mg/kg	NA	NA	NA	NA	NA
Nickel		mg/kg	NA	NA	NA	NA	NA
Selenium		mg/kg	NA	NA	NA	NA	NA
Silver	90,603	mg/kg	NA	NA	NA	NA	NA
Thallium		mg/kg	NA	NA	NA	NA	NA
Vanadium		mg/kg	NA	NA	NA	NA	NA
Zinc		mg/kg	NA	NA	NA	NA	NA
Mercury (EPA 7470)		mg/kg	NA	NA	NA	NA	NA
Lead (STLC - EPA 6010B)		ug/L	NA	NA	NA	NA	NA
Other							
Herbicides (EPA 8151A)		ug/kg	NA	NA	NA	NA	NA
Pesticides/PCBs (EPA 8081A/8082)		ug/kg	NA	NA	NA	NA	NA
96 hour LC50 Bioassay			NA	NA	NA	NA	NA

Notes:
*RAO = Soil Remedial Action Objective is listed for Base Case only
is for Commercial Maintenance Worker (see Table 1)
Bold entry indicates exceedence of Base Case RAO.
**Only compounds with detections above reporting limits
are listed for VOCs and SVOCs.
NA - Not analyzed or not applicable.
NS - Elevation not surveyed; see report for coordinates.
NR - No recovery.
ug/kg - micrograms per kilogram
mg/kg - milligrams per kilogram
< less than (not detected at or above this value)
Y - sample exhibits pattern which does not resemble standard
H - heavier hydrocarbons than indicated on standard
L - lighter hydrocarbons than indicated on standard
J - estimated value

Table 2
Soil Investigation Results
May to June 2000
Southern Area, Former Bayshore Railyard (OU-2)
Brisbane, California
Sunquest Properties, Inc.

Sample Name			R-58_SC	R-59	R-60B	R-61B	R-62B
Ground Surface Elevation			9.04	9.83	7.83	9.79	9.33
Bay Mud Depth	RAO*		8-12 (NR)	7.4	10	7.6	7.8
Sample Depth (ft)	Base Case		7.0 - 7.5	NA	9.5 - 10.0	7.0 - 7.7	7.0 - 7.5
Sampling Date	(Commercial		6/5/00	6/5/00	6/5/00	6/5/00	6/5/00
Laboratory Episode Number	Maint. Worker)		145956-007	NA	145956-009	145956-008	145956-010
Parameter		Units					
Total Volatile Hydrocarbons							
Gasoline Range		mg/kg	NA	NA	NA	NA	NA
Stoddard Solvent Range		mg/kg	NA	NA	NA	NA	NA
Total Extractable Hydrocarbons							
Diesel Range	46,000	mg/kg	497	NA	42	37	672
Motor Oil Range		mg/kg	1,230	NA	90	116	912
Bunker C Range	46,000	mg/kg	2,540	NA	200	198	2,700
VOCs (EPA 8021)							
Benzene		ug/kg	NA	NA	NA	NA	NA
Toluene		ug/kg	NA	NA	NA	NA	NA
Ethylbenzene		ug/kg	NA	NA	NA	NA	NA
m,p-Xylenes		ug/kg	NA	NA	NA	NA	NA
o-Xylenes		ug/kg	NA	NA	NA	NA	NA
HVOCs** (EPA 8260)							
1,2,4-Trimethylbenzene		ug/kg	NA	NA	NA	NA	NA
1,3,5-Trimethylbenzene		ug/kg	NA	NA	NA	NA	NA
Acetone		ug/kg	NA	NA	NA	NA	NA
Ethylbenzene		ug/kg	NA	NA	NA	NA	NA
Isopropylbenzene		ug/kg	NA	NA	NA	NA	NA
m,p-Xylenes		ug/kg	NA	NA	NA	NA	NA
Napthalene		ug/kg	NA	NA	NA	NA	NA
n-Butylbenzene		ug/kg	NA	NA	NA	NA	NA
o-Xylenes		ug/kg	NA	NA	NA	NA	NA
para-Isopropyl Toluene		ug/kg	NA	NA	NA	NA	NA
Propylbenzene		ug/kg	NA	NA	NA	NA	NA
sec-Butylbenzene		ug/kg	NA	NA	NA	NA	NA
Tetrachloroethene		ug/kg	NA	NA	NA	NA	NA
Toluene		ug/kg	NA	NA	NA	NA	NA
Trichloroethene		ug/kg	NA	NA	NA	NA	NA
Semivolatile Organics** (EPA 8270)							
2-Methylnaphthalene	216,236,000	ug/kg	NA	NA	NA	NA	NA
TITLE 26 Metals							
Antimony	1,658	mg/kg	NA	NA	NA	NA	NA
Arsenic	19	mg/kg	NA	NA	NA	NA	NA
Barium	290,217	mg/kg	NA	NA	NA	NA	NA
Beryllium		mg/kg	NA	NA	NA	NA	NA
Cadmium	2,073	mg/kg	NA	NA	NA	NA	NA
Chromium (total)		mg/kg	NA	NA	NA	NA	NA
Cobalt		mg/kg	NA	NA	NA	NA	NA
Copper		mg/kg	NA	NA	NA	NA	NA
Lead	2,464	mg/kg	NA	NA	NA	NA	NA
Molybdenum		mg/kg	NA	NA	NA	NA	NA
Nickel		mg/kg	NA	NA	NA	NA	NA
Selenium		mg/kg	NA	NA	NA	NA	NA
Silver	90,603	mg/kg	NA	NA	NA	NA	NA
Thallium		mg/kg	NA	NA	NA	NA	NA
Vanadium		mg/kg	NA	NA	NA	NA	NA
Zinc		mg/kg	NA	NA	NA	NA	NA
Mercury (EPA 7470)		mg/kg	NA	NA	NA	NA	NA
Lead (STLC - EPA 6010B)		ug/L	NA	NA	NA	NA	NA
Other							
Herbicides (EPA 8151A)		ug/kg	NA	NA	NA	NA	NA
Pesticides/PCBs (EPA 8081A/8082)		ug/kg	NA	NA	NA	NA	NA
96 hour LC50 Bioassay			NA	NA	NA	NA	NA

Notes:
*RAO = Soil Remedial Action Objective is listed for Base Case only is for Commercial Maintenance Worker (see Table 1).
Bold entry indicates exceedence of Base Case RAO.
**Only compounds with detections above reporting limits are listed for VOCs and SVOCs.
NA - Not analyzed or not applicable.
NS - Elevation not surveyed; see report for coordinates.
NR - No recovery.
ug/kg - micrograms per kilogram
mg/kg - milligrams per kilogram
< less than (not detected at or above this value)
Y - sample exhibits pattern which does not resemble standard
H - heavier hydrocarbons than indicated on standard
L - lighter hydrocarbons than indicated on standard
J - estimated value

Table 2
Soil Investigation Results
May to June 2000
Southern Area, Former Bayshore Railyard (OU-2)
Brisbane, California
Sunquest Properties, Inc.

Sample Name			R-63	R-64	R-65B	R-66	R-67A
Ground Surface Elevation			8.94	8.53	7.45	7.57	8.11
Bay Mud Depth	RAO*		9.5	9.8	10.2	9.5	9.5
Sample Depth (ft)	Base Case		NA	8.6 - 9.3	9.2 - 9.8	NA	6.0 - 6.7
Sampling Date	(Commercial		6/5/00	6/5/00	6/5/00	6/6/00	6/6/00
Laboratory Episode Number	Maint. Worker)		NA	146016-001	146016-003	NA	146016-004
Parameter		Units					
Total Volatile Hydrocarbons							
Gasoline Range		mg/kg	NA	NA	NA	NA	NA
Stoddard Solvent Range		mg/kg	NA	NA	NA	NA	NA
Total Extractable Hydrocarbons							
Diesel Range	46,000	mg/kg	NA	75	1,200	NA	1,670
Motor Oil Range		mg/kg	NA	182	840	NA	1,850
Bunker C Range	46,000	mg/kg	NA	383	4,310	NA	6,150
VOCs (EPA 8021)							
Benzene		ug/kg	NA	NA	NA	NA	NA
Toluene		ug/kg	NA	NA	NA	NA	NA
Ethylbenzene		ug/kg	NA	NA	NA	NA	NA
m,p-Xylenes		ug/kg	NA	NA	NA	NA	NA
o-Xylenes		ug/kg	NA	NA	NA	NA	NA
HVOCs** (EPA 8260)							
1,2,4-Trimethylbenzene		ug/kg	NA	NA	NA	NA	NA
1,3,5-Trimethylbenzene		ug/kg	NA	NA	NA	NA	NA
Acetone		ug/kg	NA	NA	NA	NA	NA
Ethylbenzene		ug/kg	NA	NA	NA	NA	NA
Isopropylbenzene		ug/kg	NA	NA	NA	NA	NA
m,p-Xylenes		ug/kg	NA	NA	NA	NA	NA
Napthalene		ug/kg	NA	NA	NA	NA	NA
n-Butylbenzene		ug/kg	NA	NA	NA	NA	NA
o-Xylenes		ug/kg	NA	NA	NA	NA	NA
para-Isopropyl Toluene		ug/kg	NA	NA	NA	NA	NA
Propylbenzene		ug/kg	NA	NA	NA	NA	NA
sec-Butylbenzene		ug/kg	NA	NA	NA	NA	NA
Tetrachloroethene		ug/kg	NA	NA	NA	NA	NA
Toluene		ug/kg	NA	NA	NA	NA	NA
Trichloroethene		ug/kg	NA	NA	NA	NA	NA
Semivolatile Organics** (EPA 8270)							
2-Methylnaphthalene	216,236,000	ug/kg	NA	NA	NA	NA	NA
TITLE 26 Metals							
Antimony	1,658	mg/kg	NA	NA	NA	NA	NA
Arsenic	19	mg/kg	NA	NA	NA	NA	NA
Barium	290,217	mg/kg	NA	NA	NA	NA	NA
Beryllium		mg/kg	NA	NA	NA	NA	NA
Cadmium	2,073	mg/kg	NA	NA	NA	NA	NA
Chromium (total)		mg/kg	NA	NA	NA	NA	NA
Cobalt		mg/kg	NA	NA	NA	NA	NA
Copper		mg/kg	NA	NA	NA	NA	NA
Lead	2,464	mg/kg	NA	NA	NA	NA	NA
Molybdenum		mg/kg	NA	NA	NA	NA	NA
Nickel		mg/kg	NA	NA	NA	NA	NA
Selenium		mg/kg	NA	NA	NA	NA	NA
Silver	90,603	mg/kg	NA	NA	NA	NA	NA
Thallium		mg/kg	NA	NA	NA	NA	NA
Vanadium		mg/kg	NA	NA	NA	NA	NA
Zinc		mg/kg	NA	NA	NA	NA	NA
Mercury (EPA 7470)		mg/kg	NA	NA	NA	NA	NA
Lead (STLC - EPA 6010B)		ug/L	NA	NA	NA	NA	NA
Other							
Herbicides (EPA 8151A)		ug/kg	NA	NA	NA	NA	NA
Pesticides/PCBs (EPA 8081A/8082)		ug/kg	NA	NA	NA	NA	NA
96 hour LC50 Bioassay			NA	NA	NA	NA	NA

Notes:
*RAO = Soil Remedial Action Objective is listed for Base Case only is for Commercial Maintenance Worker (see Table 1).
Bold entry indicates exceedence of Base Case RAO.
**Only compounds with detections above reporting limits are listed for VOCs and SVOCs.
NA - Not analyzed or not applicable.
NS - Elevation not surveyed; see report for coordinates.
NR - No recovery.
ug/kg - micrograms per kilogram
mg/kg - milligrams per kilogram
< less than (not detected at or above this value)
Y - sample exhibits pattern which does not resemble standard
H - heavier hydrocarbons than indicated on standard
L - lighter hydrocarbons than indicated on standard
J - estimated value

Table 2
Soil Investigation Results
May to June 2000
Southern Area, Former Bayshore Railyard (OU-2)
Brisbane, California
Sunquest Properties, Inc.

Sample Name			R-68	R-69B_SC	R-70A_SC	R-71	R-72
Ground Surface Elevation			7.95	8.18	6.78	7.63	7.78
Bay Mud Depth	RAO*		9.5	9.3	12.5	9.5	8.7
Sample Depth (ft)	Base Case		NA	8.3 - 9.0	8.5 - 9.0	NA	NA
Sampling Date	(Commercial		6/6/00	6/6/00	6/6/00	6/6/00	6/6/00
Laboratory Episode Number	Maint. Worker)		NA	146016-003	146016-006	NA	NA
Parameter		Units					
Total Volatile Hydrocarbons							
Gasoline Range		mg/kg	NA	NA	NA	NA	NA
Stoddard Solvent Range		mg/kg	NA	NA	NA	NA	NA
Total Extractable Hydrocarbons							
Diesel Range	*46,000*	mg/kg	NA	3,330	48	NA	NA
Motor Oil Range		mg/kg	NA	4,520	51	NA	NA
Bunker C Range	*46,000*	mg/kg	NA	12,700	180	NA	NA
VOCs (EPA 8021)							
Benzene		ug/kg	NA	NA	NA	NA	NA
Toluene		ug/kg	NA	NA	NA	NA	NA
Ethylbenzene		ug/kg	NA	NA	NA	NA	NA
m,p-Xylenes		ug/kg	NA	NA	NA	NA	NA
o-Xylenes		ug/kg	NA	NA	NA	NA	NA
HVOCs** (EPA 8260)							
1,2,4-Trimethylbenzene		ug/kg	NA	NA	NA	NA	NA
1,3,5-Trimethylbenzene		ug/kg	NA	NA	NA	NA	NA
Acetone		ug/kg	NA	NA	NA	NA	NA
Ethylbenzene		ug/kg	NA	NA	NA	NA	NA
Isopropylbenzene		ug/kg	NA	NA	NA	NA	NA
m,p-Xylenes		ug/kg	NA	NA	NA	NA	NA
Napthalene		ug/kg	NA	NA	NA	NA	NA
n-Butylbenzene		ug/kg	NA	NA	NA	NA	NA
o-Xylenes		ug/kg	NA	NA	NA	NA	NA
para-Isopropyl Toluene		ug/kg	NA	NA	NA	NA	NA
Propylbenzene		ug/kg	NA	NA	NA	NA	NA
sec-Butylbenzene		ug/kg	NA	NA	NA	NA	NA
Tetrachloroethene		ug/kg	NA	NA	NA	NA	NA
Toluene		ug/kg	NA	NA	NA	NA	NA
Trichloroethene		ug/kg	NA	NA	NA	NA	NA
Semivolatile Organics** (EPA 8270)							
2-Methylnaphthalene	*216,236,000*	ug/kg	NA	NA	NA	NA	NA
TITLE 26 Metals							
Antimony	*1,658*	mg/kg	NA	NA	NA	NA	NA
Arsenic	*19*	mg/kg	NA	NA	NA	NA	NA
Barium	*290,217*	mg/kg	NA	NA	NA	NA	NA
Beryllium		mg/kg	NA	NA	NA	NA	NA
Cadmium	*2,073*	mg/kg	NA	NA	NA	NA	NA
Chromium (total)		mg/kg	NA	NA	NA	NA	NA
Cobalt		mg/kg	NA	NA	NA	NA	NA
Copper		mg/kg	NA	NA	NA	NA	NA
Lead	*2,464*	mg/kg	NA	NA	NA	NA	NA
Molybdenum		mg/kg	NA	NA	NA	NA	NA
Nickel		mg/kg	NA	NA	NA	NA	NA
Selenium		mg/kg	NA	NA	NA	NA	NA
Silver	*90,603*	mg/kg	NA	NA	NA	NA	NA
Thallium		mg/kg	NA	NA	NA	NA	NA
Vanadium		mg/kg	NA	NA	NA	NA	NA
Zinc		mg/kg	NA	NA	NA	NA	NA
Mercury (EPA 7470)		mg/kg	NA	NA	NA	NA	NA
Lead (STLC - EPA 6010B)		ug/L	NA	NA	NA	NA	NA
Other							
Herbicides (EPA 8151A)		ug/kg	NA	NA	NA	NA	NA
Pesticides/PCBs (EPA 8081A/8082)		ug/kg	NA	NA	NA	NA	NA
96 hour LC50 Bioassay			NA	NA	NA	NA	NA

Notes:

*RAO = Soil Remedial Action Objective is listed for Base Case only
is for Commercial Maintenance Worker (see Table 1).

Bold entry indicates exceedance of Base Case RAO.

**Only compounds with detections above reporting limits
are listed for VOCs and SVOCs.

NA - Not analyzed or not applicable.

NS - Elevation not surveyed; see report for coordinates.

NR - No recovery.

ug/kg - micrograms per kilogram

mg/kg - milligrams per kilogram

< less than (not detected at or above this value)

Y - sample exhibits pattern which does not resemble standard

H - heavier hydrocarbons than indicated on standard

L - lighter hydrocarbons than indicated on standard

J - estimated value

Table 2
Soil Investigation Results
May to June 2000
Southern Area, Former Bayshore Railyard (OU-2)
Brisbane, California
Sunquest Properties, Inc.

Sample Name			R-73	R-74A_SC	R-74B_SC	R-75	R-76
Ground Surface Elevation			8.17	7.43	7.43	6.80	7.50
Bay Mud Depth	RAO*		10	Refusal 8.3	Refusal 8.3	9.5	10
Sample Depth (ft)	Base Case		NA	2.0 - 2.6	5.3 - 6.0	NA	NA
Sampling Date	(Commercial		6/6/00	6/6/00	6/6/00	6/6/00	6/6/00
Laboratory Episode Number	Maint. Worker)		NA	146016-006	146016-005	NA	NA
Parameter		Units					
Total Volatile Hydrocarbons							
Gasoline Range		mg/kg	NA	250HY	NA	NA	NA
Stoddard Solvent Range		mg/kg	NA	130HY	NA	NA	NA
Total Extractable Hydrocarbons							
Diesel Range	46,000	mg/kg	NA	48	4,830	NA	NA
Motor Oil Range		mg/kg	NA	51	1,290	NA	NA
Bunker C Range	46,000	mg/kg	NA	180	14,100	NA	NA
VOCs (EPA 8021)							
Benzene		ug/kg	NA	NA	NA	NA	NA
Toluene		ug/kg	NA	NA	NA	NA	NA
Ethylbenzene		ug/kg	NA	NA	NA	NA	NA
m,p-Xylenes		ug/kg	NA	NA	NA	NA	NA
o-Xylenes		ug/kg	NA	NA	NA	NA	NA
HVOCs** (EPA 8260)							
1,2,4-Trimethylbenzene		ug/kg	NA	<25	NA	NA	NA
1,3,5-Trimethylbenzene		ug/kg	NA	<25	NA	NA	NA
Acetone		ug/kg	NA	<100	NA	NA	NA
Ethylbenzene		ug/kg	NA	<25	NA	NA	NA
Isopropylbenzene		ug/kg	NA	<25	NA	NA	NA
m,p-Xylenes		ug/kg	NA	<25	NA	NA	NA
Napthalene		ug/kg	NA	<25	NA	NA	NA
n-Butylbenzene		ug/kg	NA	120	NA	NA	NA
o-Xylenes		ug/kg	NA	<25	NA	NA	NA
para-Isopropyl Toluene		ug/kg	NA	<25	NA	NA	NA
Propylbenzene		ug/kg	NA	<25	NA	NA	NA
sec-Butylbenzene		ug/kg	NA	73	NA	NA	NA
Tetrachloroethene		ug/kg	NA	87	NA	NA	NA
Toluene		ug/kg	NA	<25	NA	NA	NA
Trichloroethene		ug/kg	NA	<25	NA	NA	NA
Semivolatile Organics** (EPA 8270)							
2-Methylnaphthalene	216,236,000	ug/kg	NA	NA	NA	NA	NA
TITLE 26 Metals							
Antimony	1,658	mg/kg	NA	NA	NA	NA	NA
Arsenic	19	mg/kg	NA	NA	NA	NA	NA
Barium	290,217	mg/kg	NA	NA	NA	NA	NA
Beryllium		mg/kg	NA	NA	NA	NA	NA
Cadmium	2,073	mg/kg	NA	NA	NA	NA	NA
Chromium (total)		mg/kg	NA	NA	NA	NA	NA
Cobalt		mg/kg	NA	NA	NA	NA	NA
Copper		mg/kg	NA	NA	NA	NA	NA
Lead	2,464	mg/kg	NA	NA	NA	NA	NA
Molybdenum		mg/kg	NA	NA	NA	NA	NA
Nickel		mg/kg	NA	NA	NA	NA	NA
Selenium		mg/kg	NA	NA	NA	NA	NA
Silver	90,603	mg/kg	NA	NA	NA	NA	NA
Thallium		mg/kg	NA	NA	NA	NA	NA
Vanadium		mg/kg	NA	NA	NA	NA	NA
Zinc		mg/kg	NA	NA	NA	NA	NA
Mercury (EPA 7470)		mg/kg	NA	NA	NA	NA	NA
Lead (STLC - EPA 6010B)		ug/L	NA	NA	NA	NA	NA
Other							
Herbicides (EPA 8151A)		ug/kg	NA	NA	NA	NA	NA
Pesticides/PCBs (EPA 8081A/8082)		ug/kg	NA	NA	NA	NA	NA
96 hour LC50 Bioassay			NA	NA	NA	NA	NA

Notes:

*RAO = Soil Remedial Action Objective is listed for Base Case only
is for Commercial Maintenance Worker (see Table 1).

Bold entry indicates exceedence of Base Case RAO.

**Only compounds with detections above reporting limits
are listed for VOCs and SVOCs.

NA - Not analyzed or not applicable.

NS - Elevation not surveyed; see report for coordinates.

NR - No recovery.

ug/kg - micrograms per kilogram

mg/kg - milligrams per kilogram

< less than (not detected at or above this value)

Y - sample exhibits pattern which does not resemble standard

H - heavier hydrocarbons than indicated on standard

L - lighter hydrocarbons than indicated on standard

J - estimated value

Table 2
Soil Investigation Results
May to June 2000
Southern Area, Former Bayshore Railyard (OU-2)
Brisbane, California
Sunquest Properties, Inc.

Sample Name			R-77_SC	R-78	R-79	R-80B_SC	R-81_SC
Ground Surface Elevation			5.57	5.53	6.51	8.12	7.59
Bay Mud Depth	RAO*		5.3	10	6	6.5	5.9
Sample Depth (ft)	Base Case		4.3 - 4.8	NA	NA	5.0 - 5.5	5.0 - 5.9
Sampling Date	(Commercial		6/6/00	6/6/00	6/7/00	6/7/00	6/7/00
Laboratory Episode Number	Maint. Worker)		146015-004	NA	NA	146015-005	146015-006
Parameter		Units					
Total Volatile Hydrocarbons							
Gasoline Range		mg/kg	NA	NA	NA	NA	NA
Stoddard Solvent Range		mg/kg	NA	NA	NA	NA	NA
Total Extractable Hydrocarbons							
Diesel Range	46,000	mg/kg	121,000	NA	NA	42	16,100
Motor Oil Range		mg/kg	208,000	NA	NA	142	32,000
Bunker C Range	46,000	mg/kg	550,000	NA	NA	250	83,500
VOCs (EPA 8021)							
Benzene		ug/kg	NA	NA	NA	NA	NA
Toluene		ug/kg	NA	NA	NA	NA	NA
Ethylbenzene		ug/kg	NA	NA	NA	NA	NA
m,p-Xylenes		ug/kg	NA	NA	NA	NA	NA
o-Xylenes		ug/kg	NA	NA	NA	NA	NA
HVOCs** (EPA 8260)							
1,2,4-Trimethylbenzene		ug/kg	NA	NA	NA	NA	NA
1,3,5-Trimethylbenzene		ug/kg	NA	NA	NA	NA	NA
Acetone		ug/kg	NA	NA	NA	NA	NA
Ethylbenzene		ug/kg	NA	NA	NA	NA	NA
Isopropylbenzene		ug/kg	NA	NA	NA	NA	NA
m,p-Xylenes		ug/kg	NA	NA	NA	NA	NA
Napthalene		ug/kg	NA	NA	NA	NA	NA
n-Butylbenzene		ug/kg	NA	NA	NA	NA	NA
o-Xylenes		ug/kg	NA	NA	NA	NA	NA
para-Isopropyl Toluene		ug/kg	NA	NA	NA	NA	NA
Propylbenzene		ug/kg	NA	NA	NA	NA	NA
sec-Butylbenzene		ug/kg	NA	NA	NA	NA	NA
Tetrachloroethene		ug/kg	NA	NA	NA	NA	NA
Toluene		ug/kg	NA	NA	NA	NA	NA
Trichloroethene		ug/kg	NA	NA	NA	NA	NA
Semivolatile Organics** (EPA 8270)							
2-Methylnaphthalene	216,236,000	ug/kg	<13,000	NA	NA	NA	NA
TITLE 26 Metals							
Antimony	1,658	mg/kg	NA	NA	NA	NA	NA
Arsenic	19	mg/kg	NA	NA	NA	NA	NA
Barium	290,217	mg/kg	NA	NA	NA	NA	NA
Beryllium		mg/kg	NA	NA	NA	NA	NA
Cadmium	2,073	mg/kg	NA	NA	NA	NA	NA
Chromium (total)		mg/kg	NA	NA	NA	NA	NA
Cobalt		mg/kg	NA	NA	NA	NA	NA
Copper		mg/kg	NA	NA	NA	NA	NA
Lead	2,464	mg/kg	NA	NA	NA	NA	NA
Molybdenum		mg/kg	NA	NA	NA	NA	NA
Nickel		mg/kg	NA	NA	NA	NA	NA
Selenium		mg/kg	NA	NA	NA	NA	NA
Silver	90,603	mg/kg	NA	NA	NA	NA	NA
Thallium		mg/kg	NA	NA	NA	NA	NA
Vanadium		mg/kg	NA	NA	NA	NA	NA
Zinc		mg/kg	NA	NA	NA	NA	NA
Mercury (EPA 7470)		mg/kg	NA	NA	NA	NA	NA
Lead (STLC - EPA 6010B)		ug/L	NA	NA	NA	NA	NA
Other							
Herbicides (EPA 8151A)		ug/kg	NA	NA	NA	NA	NA
Pesticides/PCBs (EPA 8081A/8082)		ug/kg	NA	NA	NA	NA	NA
96 hour LC50 Bioassay			NA	NA	NA	NA	NA

Notes:
*RAO = Soil Remedial Action Objective is listed for Base Case only is for Commercial Maintenance Worker (see Table 1).
Bold entry indicates exceedence of Base Case RAO.
**Only compounds with detections above reporting limits are listed for VOCs and SVOCs.
NA - Not analyzed or not applicable.
NS - Elevation not surveyed; see report for coordinates.
NR - No recovery.
ug/kg - micrograms per kilogram
mg/kg - milligrams per kilogram
< less than (not detected at or above this value)
Y - sample exhibits pattern which does not resemble standard
H - heavier hydrocarbons than indicated on standard
L - lighter hydrocarbons than indicated on standard
J - estimated value

Table 2
Soil Investigation Results
May to June 2000
Southern Area, Former Bayshore Railyard (OU-2)
Brisbane, California
Sunquest Properties, Inc.

Sample Name			R-82_SC	R-83_SC	R-84_SC	R-85_SC	R-86
Ground Surface Elevation			7.40	7.45	6.41	7.06	6.14
Bay Mud Depth	RAO*		Refusal 4.5	5.5	5	7.5	6
Sample Depth (ft)	Base Case		4.0 - 4.5	4.9 - 5.6	4.5 - 5.0	5.4 - 6.0	NA
Sampling Date	(Commercial		6/7/00	6/7/00	6/7/00	6/7/00	6/7/00
Laboratory Episode Number	Maint. Worker)		146015-007	146015-008	146015-009	146015-010	NA
Parameter		Units					
Total Volatile Hydrocarbons							
Gasoline Range		mg/kg	NA	NA	NA	NA	NA
Stoddard Solvent Range		mg/kg	NA	NA	NA	NA	NA
Total Extractable Hydrocarbons							
Diesel Range	46,000	mg/kg	12,800	615	4,170	270	NA
Motor Oil Range		mg/kg	27,300	1,120	7,420	195	NA
Bunker C Range	46,000	mg/kg	63,400	2,900	20,000	1,040	NA
VOCs (EPA 8021)							
Benzene		ug/kg	NA	NA	NA	NA	NA
Toluene		ug/kg	NA	NA	NA	NA	NA
Ethylbenzene		ug/kg	NA	NA	NA	NA	NA
m,p-Xylenes		ug/kg	NA	NA	NA	NA	NA
o-Xylenes		ug/kg	NA	NA	NA	NA	NA
HVOCs** (EPA 8260)							
1,2,4-Trimethylbenzene		ug/kg	NA	NA	NA	NA	NA
1,3,5-Trimethylbenzene		ug/kg	NA	NA	NA	NA	NA
Acetone		ug/kg	NA	NA	NA	NA	NA
Ethylbenzene		ug/kg	NA	NA	NA	NA	NA
Isopropylbenzene		ug/kg	NA	NA	NA	NA	NA
m,p-Xylenes		ug/kg	NA	NA	NA	NA	NA
Napthalene		ug/kg	NA	NA	NA	NA	NA
n-Butylbenzene		ug/kg	NA	NA	NA	NA	NA
o-Xylenes		ug/kg	NA	NA	NA	NA	NA
para-Isopropyl Toluene		ug/kg	NA	NA	NA	NA	NA
Propylbenzene		ug/kg	NA	NA	NA	NA	NA
sec-Butylbenzene		ug/kg	NA	NA	NA	NA	NA
Tetrachloroethene		ug/kg	NA	NA	NA	NA	NA
Toluene		ug/kg	NA	NA	NA	NA	NA
Trichloroethene		ug/kg	NA	NA	NA	NA	NA
Semivolatile Organics** (EPA 8270)							
2-Methylnaphthalene	216,236,000	ug/kg	NA	NA	NA	NA	NA
TITLE 26 Metals							
Antimony	1,658	mg/kg	NA	NA	NA	NA	NA
Arsenic	19	mg/kg	NA	NA	NA	NA	NA
Barium	290,217	mg/kg	NA	NA	NA	NA	NA
Beryllium		mg/kg	NA	NA	NA	NA	NA
Cadmium	2,073	mg/kg	NA	NA	NA	NA	NA
Chromium (total)		mg/kg	NA	NA	NA	NA	NA
Cobalt		mg/kg	NA	NA	NA	NA	NA
Copper		mg/kg	NA	NA	NA	NA	NA
Lead	2,464	mg/kg	NA	NA	NA	NA	NA
Molybdenum		mg/kg	NA	NA	NA	NA	NA
Nickel		mg/kg	NA	NA	NA	NA	NA
Selenium		mg/kg	NA	NA	NA	NA	NA
Silver	90,603	mg/kg	NA	NA	NA	NA	NA
Thallium		mg/kg	NA	NA	NA	NA	NA
Vanadium		mg/kg	NA	NA	NA	NA	NA
Zinc		mg/kg	NA	NA	NA	NA	NA
Mercury (EPA 7470)		mg/kg	NA	NA	NA	NA	NA
Lead (STLC - EPA 6010B)		ug/L	NA	NA	NA	NA	NA
Other							
Herbicides (EPA 8151A)		ug/kg	NA	NA	NA	NA	NA
Pesticides/PCBs (EPA 8081A/8082)		ug/kg	NA	NA	NA	NA	NA
96 hour LC50 Bioassay			NA	NA	NA	NA	NA

Notes:

*RAO = Soil Remedial Action Objective is listed for Base Case only
is for Commercial Maintenance Worker (see Table 1).

Bold entry indicates exceedence of Base Case RAO.

**Only compounds with detections above reporting limits
are listed for VOCs and SVOCs.

NA - Not analyzed or not applicable.

NS - Elevation not surveyed; see report for coordinates.

NR - No recovery.

ug/kg - micrograms per kilogram

mg/kg - milligrams per kilogram

< less than (not detected at or above this value)

Y - sample exhibits pattern which does not resemble standard

H - heavier hydrocarbons than indicated on standard

L - lighter hydrocarbons than indicated on standard

J - estimated value

Table 2
Soil Investigation Results
May to June 2000
Southern Area, Former Bayshore Railyard (OU-2)
Brisbane, California
Sunquest Properties, Inc.

Sample Name			R-87_SC	R-88	R-89_SC	R-90_SC	R-91B_SC
Ground Surface Elevation			7.55	7.80	8.08	7.80	8.21
Bay Mud Depth	RAO*		6	5	9-12 (NR)	5	6.5
Sample Depth (ft)	Base Case		4.5 - 5.0	NA	7.8 - 8.4	4.0 - 4.3	5.8 - 6.5
Sampling Date	(Commercial		6/7/00	6/7/00	6/7/00	6/7/00	6/7/00
Laboratory Episode Number	Maint. Worker)		146015-011	NA	146015-012	146015-013	146013-001
Parameter		Units					
Total Volatile Hydrocarbons							
Gasoline Range		mg/kg	NA	NA	NA	NA	NA
Stoddard Solvent Range		mg/kg	NA	NA	NA	NA	NA
Total Extractable Hydrocarbons							
Diesel Range	46,000	mg/kg	10,800	NA	22,100	17,400	2,560
Motor Oil Range		mg/kg	18,600	NA	44,700	34,700	8,560
Bunker C Range	46,000	mg/kg	50,100	NA	104,000	84,800	14,800
VOCs (EPA 8021)							
Benzene		ug/kg	NA	NA	NA	NA	NA
Toluene		ug/kg	NA	NA	NA	NA	NA
Ethylbenzene		ug/kg	NA	NA	NA	NA	NA
m,p-Xylenes		ug/kg	NA	NA	NA	NA	NA
o-Xylenes		ug/kg	NA	NA	NA	NA	NA
HVOCs** (EPA 8260)							
1,2,4-Trimethylbenzene		ug/kg	NA	NA	NA	NA	NA
1,3,5-Trimethylbenzene		ug/kg	NA	NA	NA	NA	NA
Acetone		ug/kg	NA	NA	NA	NA	NA
Ethylbenzene		ug/kg	NA	NA	NA	NA	NA
Isopropylbenzene		ug/kg	NA	NA	NA	NA	NA
m,p-Xylenes		ug/kg	NA	NA	NA	NA	NA
Napthalene		ug/kg	NA	NA	NA	NA	NA
n-Butylbenzene		ug/kg	NA	NA	NA	NA	NA
o-Xylenes		ug/kg	NA	NA	NA	NA	NA
para-Isopropyl Toluene		ug/kg	NA	NA	NA	NA	NA
Propylbenzene		ug/kg	NA	NA	NA	NA	NA
sec-Butylbenzene		ug/kg	NA	NA	NA	NA	NA
Tetrachloroethene		ug/kg	NA	NA	NA	NA	NA
Toluene		ug/kg	NA	NA	NA	NA	NA
Trichloroethene		ug/kg	NA	NA	NA	NA	NA
Semivolatile Organics** (EPA 8270)							
2-Methylnaphthalene	216,236,000	ug/kg	NA	NA	NA	NA	NA
TITLE 26 Metals							
Antimony	1,658	mg/kg	NA	NA	NA	NA	NA
Arsenic	19	mg/kg	NA	NA	NA	NA	NA
Barium	290,217	mg/kg	NA	NA	NA	NA	NA
Beryllium		mg/kg	NA	NA	NA	NA	NA
Cadmium	2,073	mg/kg	NA	NA	NA	NA	NA
Chromium (total)		mg/kg	NA	NA	NA	NA	NA
Cobalt		mg/kg	NA	NA	NA	NA	NA
Copper		mg/kg	NA	NA	NA	NA	NA
Lead	2,464	mg/kg	NA	NA	NA	NA	NA
Molybdenum		mg/kg	NA	NA	NA	NA	NA
Nickel		mg/kg	NA	NA	NA	NA	NA
Selenium		mg/kg	NA	NA	NA	NA	NA
Silver	90,603	mg/kg	NA	NA	NA	NA	NA
Thallium		mg/kg	NA	NA	NA	NA	NA
Vanadium		mg/kg	NA	NA	NA	NA	NA
Zinc		mg/kg	NA	NA	NA	NA	NA
Mercury (EPA 7470)		mg/kg	NA	NA	NA	NA	NA
Lead (STLC - EPA 6010B)		ug/L	NA	NA	NA	NA	NA
Other							
Herbicides (EPA 8151A)		ug/kg	NA	NA	NA	NA	NA
Pesticides/PCBs (EPA 8081A/8082)		ug/kg	NA	NA	NA	NA	NA
96 hour LC50 Bioassay			NA	NA	NA	NA	NA

Notes:
*RAO = Soil Remedial Action Objective is listed for Base Case only is for Commercial Maintenance Worker (see Table 1).
Bold entry indicates exceedence of Base Case RAO.
**Only compounds with detections above reporting limits are listed for VOCs and SVOCs.
NA - Not analyzed or not applicable.
NS - Elevation not surveyed; see report for coordinates.
NR - No recovery.
ug/kg - micrograms per kilogram
mg/kg - milligrams per kilogram
< less than (not detected at or above this value)
Y - sample exhibits pattern which does not resemble standard
H - heavier hydrocarbons than indicated on standard
L - lighter hydrocarbons than indicated on standard
J - estimated value

Table 2
Soil Investigation Results
May to June 2000
Southern Area, Former Bayshore Railyard (OU-2)
Brisbane, California
Sunquest Properties, Inc.

Sample Name			R-92_SC	R-93A_SC	R-93B_SC	R-94_SC	R-95
Ground Surface Elevation			8.78	7.72	7.72	6.35	6.94
Bay Mud Depth	RAO*		6	10	10	6	8
Sample Depth (ft)	Base Case		4.0 - 4.5	1.5 - 2.0	5.5 - 6.0	4.5 - 5.0	NA
Sampling Date	(Commercial		6/7/00	6/7/00	6/7/00	6/7/00	6/9/00
Laboratory Episode Number	Maint. Worker)		146013-002	146015-003	146013-004	146013-005	NA
Parameter		Units					
Total Volatile Hydrocarbons							
Gasoline Range		mg/kg	NA	2.7Y	NA	NA	NA
Stoddard Solvent Range		mg/kg	NA	1.3Y	NA	NA	NA
Total Extractable Hydrocarbons							
Diesel Range	46,000	mg/kg	**60,100**	NA	514	32,500	NA
Motor Oil Range		mg/kg	103,000	NA	981	66,600	NA
Bunker C Range	46,000	mg/kg	**273,000**	NA	2,400	**157,000**	NA
VOCs (EPA 8021)							
Benzene		ug/kg	NA	NA	NA	NA	NA
Toluene		ug/kg	NA	NA	NA	NA	NA
Ethylbenzene		ug/kg	NA	NA	NA	NA	NA
m,p-Xylenes		ug/kg	NA	NA	NA	NA	NA
o-Xylenes		ug/kg	NA	NA	NA	NA	NA
HVOCs** (EPA 8260)							
1,2,4-Trimethylbenzene		ug/kg	NA	<5.0	NA	NA	NA
1,3,5-Trimethylbenzene		ug/kg	NA	<5.0	NA	NA	NA
Acetone		ug/kg	NA	63	NA	NA	NA
Ethylbenzene		ug/kg	NA	<5.0	NA	NA	NA
Isopropylbenzene		ug/kg	NA	<5.0	NA	NA	NA
m,p-Xylenes		ug/kg	NA	<5.0	NA	NA	NA
Napthalene		ug/kg	NA	<5.0	NA	NA	NA
n-Butylbenzene		ug/kg	NA	7	NA	NA	NA
o-Xylenes		ug/kg	NA	<5.0	NA	NA	NA
para-Isopropyl Toluene		ug/kg	NA	<5.0	NA	NA	NA
Propylbenzene		ug/kg	NA	<5.0	NA	NA	NA
sec-Butylbenzene		ug/kg	NA	3	NA	NA	NA
Tetrachloroethene		ug/kg	NA	<5.0	NA	NA	NA
Toluene		ug/kg	NA	<5.0	NA	NA	NA
Trichloroethene		ug/kg	NA	<5.0	NA	NA	NA
Semivolatile Organics** (EPA 8270)							
2-Methylnaphthalene	216,236,000	ug/kg	NA	NA	NA	NA	NA
TITLE 26 Metals							
Antimony	1,658	mg/kg	NA	NA	NA	NA	NA
Arsenic	19	mg/kg	NA	NA	NA	NA	NA
Barium	290,217	mg/kg	NA	NA	NA	NA	NA
Beryllium		mg/kg	NA	NA	NA	NA	NA
Cadmium	2,073	mg/kg	NA	NA	NA	NA	NA
Chromium (total)		mg/kg	NA	NA	NA	NA	NA
Cobalt		mg/kg	NA	NA	NA	NA	NA
Copper		mg/kg	NA	NA	NA	NA	NA
Lead	2,464	mg/kg	NA	NA	NA	NA	NA
Molybdenum		mg/kg	NA	NA	NA	NA	NA
Nickel		mg/kg	NA	NA	NA	NA	NA
Selenium		mg/kg	NA	NA	NA	NA	NA
Silver	90,603	mg/kg	NA	NA	NA	NA	NA
Thallium		mg/kg	NA	NA	NA	NA	NA
Vanadium		mg/kg	NA	NA	NA	NA	NA
Zinc		mg/kg	NA	NA	NA	NA	NA
Mercury (EPA 7470)		mg/kg	NA	NA	NA	NA	NA
Lead (STLC - EPA 6010B)		ug/L	NA	NA	NA	NA	NA
Other							
Herbicides (EPA 8151A)		ug/kg	NA	NA	NA	NA	NA
Pesticides/PCBs (EPA 8081A/8082)		ug/kg	NA	NA	NA	NA	NA
96 hour LC50 Bioassay			NA	NA	NA	NA	NA

Notes:

*RAO = Soil Remedial Action Objective is listed for Base Case only is for Commercial Maintenance Worker (see Table 1).

Bold entry indicates exceedence of Base Case RAO.

**Only compounds with detections above reporting limits are listed for VOCs and SVOCs.

NA - Not analyzed or not applicable.

NS - Elevation not surveyed; see report for coordinates.

NR - No recovery.

ug/kg - micrograms per kilogram

mg/kg - milligrams per kilogram

< less than (not detected at or above this value)

Y - sample exhibits pattern which does not resemble standard

H - heavier hydrocarbons than indicated on standard

L - lighter hydrocarbons than indicated on standard

J - estimated value

Table 2
Soil Investigation Results
May to June 2000
Southern Area, Former Bayshore Railyard (OU-2)
Brisbane, California
Sunquest Properties, Inc.

Sample Name			R-96	R-97_SC	R-98	R-99	R-100
Ground Surface Elevation			7.97	6.71	6.39	6.56	8.19
Bay Mud Depth	RAO*		6	7.2	7	7.5	9.5
Sample Depth (ft)	Base Case		NA	6.5 - 7.0	NA	NA	NA
Sampling Date	(Commercial		6/9/00	6/9/00	6/9/00	6/9/00	6/9/00
Laboratory Episode Number	Maint. Worker)		NA	146036-006	NA	NA	NA
Parameter		Units					
Total Volatile Hydrocarbons							
Gasoline Range		mg/kg	NA	NA	NA	NA	NA
Stoddard Solvent Range		mg/kg	NA	NA	NA	NA	NA
Total Extractable Hydrocarbons							
Diesel Range	46,000	mg/kg	NA	20,000HY	NA	NA	NA
Motor Oil Range		mg/kg	NA	NA	NA	NA	NA
Bunker C Range	46,000	mg/kg	NA	**83,000Y**	NA	NA	NA
VOCs (EPA 8021)							
Benzene		ug/kg	NA	NA	NA	NA	NA
Toluene		ug/kg	NA	NA	NA	NA	NA
Ethylbenzene		ug/kg	NA	NA	NA	NA	NA
m,p-Xylenes		ug/kg	NA	NA	NA	NA	NA
o-Xylenes		ug/kg	NA	NA	NA	NA	NA
HVOCs** (EPA 8260)							
1,2,4-Trimethylbenzene		ug/kg	NA	NA	NA	NA	NA
1,3,5-Trimethylbenzene		ug/kg	NA	NA	NA	NA	NA
Acetone		ug/kg	NA	NA	NA	NA	NA
Ethylbenzene		ug/kg	NA	NA	NA	NA	NA
Isopropylbenzene		ug/kg	NA	NA	NA	NA	NA
m,p-Xylenes		ug/kg	NA	NA	NA	NA	NA
Napthalene		ug/kg	NA	NA	NA	NA	NA
n-Butylbenzene		ug/kg	NA	NA	NA	NA	NA
o-Xylenes		ug/kg	NA	NA	NA	NA	NA
para-Isopropyl Toluene		ug/kg	NA	NA	NA	NA	NA
Propylbenzene		ug/kg	NA	NA	NA	NA	NA
sec-Butylbenzene		ug/kg	NA	NA	NA	NA	NA
Tetrachloroethene		ug/kg	NA	NA	NA	NA	NA
Toluene		ug/kg	NA	NA	NA	NA	NA
Trichloroethene		ug/kg	NA	NA	NA	NA	NA
Semivolatile Organics** (EPA 8270)							
2-Methylnaphthalene	216,236,000	ug/kg	NA	NA	NA	NA	NA
TITLE 26 Metals							
Antimony	1,658	mg/kg	NA	NA	NA	NA	NA
Arsenic	19	mg/kg	NA	NA	NA	NA	NA
Barium	290,217	mg/kg	NA	NA	NA	NA	NA
Beryllium		mg/kg	NA	NA	NA	NA	NA
Cadmium	2,073	mg/kg	NA	NA	NA	NA	NA
Chromium (total)		mg/kg	NA	NA	NA	NA	NA
Cobalt		mg/kg	NA	NA	NA	NA	NA
Copper		mg/kg	NA	NA	NA	NA	NA
Lead	2,464	mg/kg	NA	NA	NA	NA	NA
Molybdenum		mg/kg	NA	NA	NA	NA	NA
Nickel		mg/kg	NA	NA	NA	NA	NA
Selenium		mg/kg	NA	NA	NA	NA	NA
Silver	90,603	mg/kg	NA	NA	NA	NA	NA
Thallium		mg/kg	NA	NA	NA	NA	NA
Vanadium		mg/kg	NA	NA	NA	NA	NA
Zinc		mg/kg	NA	NA	NA	NA	NA
Mercury (EPA 7470)		mg/kg	NA	NA	NA	NA	NA
Lead (STLC - EPA 6010B)		ug/L	NA	NA	NA	NA	NA
Other							
Herbicides (EPA 8151A)		ug/kg	NA	NA	NA	NA	NA
Pesticides/PCBs (EPA 8081A/8082)		ug/kg	NA	NA	NA	NA	NA
96 hour LC50 Bioassay			NA	NA	NA	NA	NA

Notes:
*RAO = Soil Remedial Action Objective is listed for Base Case only is for Commercial Maintenance Worker (see Table 1).
Bold entry indicates exceedence of Base Case RAO.
**Only compounds with detections above reporting limits are listed for VOCs and SVOCs.
NA - Not analyzed or not applicable.
NS - Elevation not surveyed; see report for coordinates.
NR - No recovery.
ug/kg - micrograms per kilogram
mg/kg - milligrams per kilogram
< less than (not detected at or above this value)
Y - sample exhibits pattern which does not resemble standard
H - heavier hydrocarbons than indicated on standard
L - lighter hydrocarbons than indicated on standard
J - estimated value

Table 2
Soil Investigation Results
May to June 2000
Southern Area, Former Bayshore Railyard (OU-2)
Brisbane, California
Sunquest Properties, Inc.

Sample Name			R-101	R-102_SC	R-103_SC	R-104_SC	R-106
Ground Surface Elevation			7.59	6.85	6.70	9.16	7.15
Bay Mud Depth	RAO*		7	4.8	6	6.5	6
Sample Depth (ft)	Base Case		NA	4.0 - 4.3	4.0 - 4.5	6.0 - 6.5	NA
Sampling Date	(Commercial		6/9/00	6/9/00	6/9/00	6/9/00	6/9/00
Laboratory Episode Number	Maint. Worker)		NA	146036-004	146036-003	146036-005	NA
Parameter		Units					
Total Volatile Hydrocarbons							
Gasoline Range		mg/kg	NA	NA	NA	NA	NA
Stoddard Solvent Range		mg/kg	NA	NA	NA	NA	NA
Total Extractable Hydrocarbons							
Diesel Range	46,000	mg/kg	NA	7,500HY	13,000HY	31,000HY	NA
Motor Oil Range		mg/kg	NA	NA	NA	NA	NA
Bunker C Range	46,000	mg/kg	NA	31,000Y	58,000Y	130,000Y	NA
VOCs (EPA 8021)							
Benzene		ug/kg	NA	NA	NA	NA	NA
Toluene		ug/kg	NA	NA	NA	NA	NA
Ethylbenzene		ug/kg	NA	NA	NA	NA	NA
m,p-Xylenes		ug/kg	NA	NA	NA	NA	NA
o-Xylenes		ug/kg	NA	NA	NA	NA	NA
HVOCs** (EPA 8260)							
1,2,4-Trimethylbenzene		ug/kg	NA	NA	NA	NA	NA
1,3,5-Trimethylbenzene		ug/kg	NA	NA	NA	NA	NA
Acetone		ug/kg	NA	NA	NA	NA	NA
Ethylbenzene		ug/kg	NA	NA	NA	NA	NA
Isopropylbenzene		ug/kg	NA	NA	NA	NA	NA
m,p-Xylenes		ug/kg	NA	NA	NA	NA	NA
Napthalene		ug/kg	NA	NA	NA	NA	NA
n-Butylbenzene		ug/kg	NA	NA	NA	NA	NA
o-Xylenes		ug/kg	NA	NA	NA	NA	NA
para-Isopropyl Toluene		ug/kg	NA	NA	NA	NA	NA
Propylbenzene		ug/kg	NA	NA	NA	NA	NA
sec-Butylbenzene		ug/kg	NA	NA	NA	NA	NA
Tetrachloroethene		ug/kg	NA	NA	NA	NA	NA
Toluene		ug/kg	NA	NA	NA	NA	NA
Trichloroethene		ug/kg	NA	NA	NA	NA	NA
Semivolatile Organics** (EPA 8270)							
2-Methylnaphthalene	216,236,000	ug/kg	NA	NA	NA	NA	NA
TITLE 26 Metals							
Antimony	1,658	mg/kg	NA	NA	NA	NA	NA
Arsenic	19	mg/kg	NA	NA	NA	NA	NA
Barium	290,217	mg/kg	NA	NA	NA	NA	NA
Beryllium		mg/kg	NA	NA	NA	NA	NA
Cadmium	2,073	mg/kg	NA	NA	NA	NA	NA
Chromium (total)		mg/kg	NA	NA	NA	NA	NA
Cobalt		mg/kg	NA	NA	NA	NA	NA
Copper		mg/kg	NA	NA	NA	NA	NA
Lead	2,464	mg/kg	NA	NA	NA	NA	NA
Molybdenum		mg/kg	NA	NA	NA	NA	NA
Nickel		mg/kg	NA	NA	NA	NA	NA
Selenium		mg/kg	NA	NA	NA	NA	NA
Silver	90,603	mg/kg	NA	NA	NA	NA	NA
Thallium		mg/kg	NA	NA	NA	NA	NA
Vanadium		mg/kg	NA	NA	NA	NA	NA
Zinc		mg/kg	NA	NA	NA	NA	NA
Mercury (EPA 7470)		mg/kg	NA	NA	NA	NA	NA
Lead (STLC - EPA 6010B)		ug/L	NA	NA	NA	NA	NA
Other							
Herbicides (EPA 8151A)		ug/kg	NA	NA	NA	NA	NA
Pesticides/PCBs (EPA 8081A/8082)		ug/kg	NA	NA	NA	NA	NA
96 hour LC50 Bioassay			NA	NA	NA	NA	NA

Notes:

*RAO = Soil Remedial Action Objective is listed for Base Case only is for Commercial Maintenance Worker (see Table 1).

Bold entry indicates exceedence of Base Case RAO.

**Only compounds with detections above reporting limits are listed for VOCs and SVOCs.

NA - Not analyzed or not applicable.

NS - Elevation not surveyed; see report for coordinates.

NR - No recovery.

ug/kg - micrograms per kilogram

mg/kg - milligrams per kilogram

< less than (not detected at or above this value)

Y - sample exhibits pattern which does not resemble standard

H - heavier hydrocarbons than indicated on standard

L - lighter hydrocarbons than indicated on standard

J - estimated value

Table 2
Soil Investigation Results
May to June 2000
Southern Area, Former Bayshore Railyard (OU-2)
Brisbane, California
Sunquest Properties, Inc.

Sample Name			R-107	R-108_SC	R-108_Comp	R-109_SC	R-109_Comp
Ground Surface Elevation			6.61	8.26	8.26	6.80	6.80
Bay Mud Depth	RAO*		12	6	6	6.5	6.5
Sample Depth (ft)	Base Case		NA	5.0 - 5.4	Composite	5.5 - 6.0	Composite
Sampling Date	(Commercial		6/9/00	6/14/00	6/14/00	6/14/00	6/14/00
Laboratory Episode Number	Maint. Worker)		NA	146124-009	146124-010	146124-012	146124-013
Parameter		Units					
Total Volatile Hydrocarbons							
Gasoline Range		mg/kg	NA	310Y	NA	180HY	NA
Stoddard Solvent Range		mg/kg	NA	160	NA	88Y	NA
Total Extractable Hydrocarbons							
Diesel Range	46,000	mg/kg	NA	NA	NA	NA	NA
Motor Oil Range		mg/kg	NA	NA	NA	NA	NA
Bunker C Range	46,000	mg/kg	NA	NA	NA	NA	NA
VOCs (EPA 8021)							
Benzene		ug/kg	NA	<50	NA	55	NA
Toluene		ug/kg	NA	<50	NA	50U	NA
Ethylbenzene		ug/kg	NA	1900C	NA	310C	NA
m,p-Xylenes		ug/kg	NA	950C	NA	530	NA
o-Xylenes		ug/kg	NA	1,400	NA	550	NA
HVOCs** (EPA 8260)							
1,2,4-Trimethylbenzene		ug/kg	NA	200J	NA	1,700	NA
1,3,5-Trimethylbenzene		ug/kg	NA	<250	NA	440	NA
Acetone		ug/kg	NA	<1000	NA	<1000	NA
Ethylbenzene		ug/kg	NA	<250	NA	<250	NA
Isopropylbenzene		ug/kg	NA	400	NA	<250	NA
m,p-Xylenes		ug/kg	NA	<250	NA	380	NA
Napthalene		ug/kg	NA	500	NA	3,100	NA
n-Butylbenzene		ug/kg	NA	410	NA	370	NA
o-Xylenes		ug/kg	NA	<250	NA	330	NA
para-Isopropyl Toluene		ug/kg	NA	150J	NA	430	NA
Propylbenzene		ug/kg	NA	420	NA	200J	NA
sec-Butylbenzene		ug/kg	NA	480	NA	140J	NA
Tetrachloroethene		ug/kg	NA	<250	NA	<250	NA
Toluene		ug/kg	NA	<250	NA	<250	NA
Trichloroethene		ug/kg	NA	<250	NA	<250	NA
Semivolatile Organics** (EPA 8270)							
2-Methylnaphthalene	216,236,000	ug/kg	NA	NA	NA	NA	NA
TITLE 26 Metals							
Antimony	1,658	mg/kg	NA	NA	<3	NA	<3
Arsenic	19	mg/kg	NA	NA	1.7	NA	7.3
Barium	290,217	mg/kg	NA	NA	31.0	NA	240.0
Beryllium		mg/kg	NA	NA	<0.099	NA	0.3
Cadmium	2,073	mg/kg	NA	NA	0.9	NA	2.7
Chromium (total)		mg/kg	NA	NA	8.7	NA	12.0
Cobalt		mg/kg	NA	NA	1.8	NA	4.0
Copper		mg/kg	NA	NA	19.0	NA	170.0
Lead	2,464	mg/kg	NA	NA	140.0	NA	900.0
Molybdenum		mg/kg	NA	NA	<0.99	NA	<0.99
Nickel		mg/kg	NA	NA	21.0	NA	18.0
Selenium		mg/kg	NA	NA	<0.25	NA	<0.25
Silver	90,603	mg/kg	NA	NA	<0.25	NA	1.3
Thallium		mg/kg	NA	NA	<0.25	NA	<0.25
Vanadium		mg/kg	NA	NA	12.0	NA	17.0
Zinc		mg/kg	NA	NA	81.0	NA	400.0
Mercury (EPA 7470)		mg/kg	NA	NA	0.2	NA	0.2
Lead (STLC - EPA 6010B)		ug/L	NA	NA	NA	NA	NA
Other							
Herbicides (EPA 8151A)		ug/kg	NA	NA	ND	NA	ND
Pesticides/PCBs (EPA 8081A/8082)		ug/kg	NA	NA	ND	NA	ND
96 hour LC50 Bioassay			NA	NA	NA	NA	NA

Notes:

*RAO = Soil Remedial Action Objective is listed for Base Case only
Is for Commercial Maintenance Worker (see Table 1).

Bold entry indicates exceedence of Base Case RAO.

**Only compounds with detections above reporting limits
are listed for VOCs and SVOCs.

NA - Not analyzed or not applicable.

NS - Elevation not surveyed; see report for coordinates.

NR - No recovery.

ug/kg - micrograms per kilogram

mg/kg - milligrams per kilogram

< less than (not detected at or above this value)

Y - sample exhibits pattern which does not resemble standard

H - heavier hydrocarbons than indicated on standard

L - lighter hydrocarbons than indicated on standard

J - estimated value

Table 2
Soil Investigation Results
May to June 2000
Southern Area, Former Bayshore Railyard (OU-2)
Brisbane, California
Sunquest Properties, Inc.

Sample Name Ground Surface Elevation Bay Mud Depth Sample Depth (ft) Sampling Date Laboratory Episode Number	*RAO* Base Case (Commercial Maint. Worker)*		R-110_Comp 8.87 7.5 Composite 6/14/00 146124-011	R-111_Comp 7.30 7 Composite 6/14/00 146124-005	R-112_Comp 7.98 8 Composite 6/14/00 146124-006	R-113_SC 7.52 9-12 (NR) 5.4 - 5.8 6/14/00 146124-007	R-113_Comp 7.52 9-12 (NR) Composite 6/14/00 146124-008
Parameter		Units					
Total Volatile Hydrocarbons							
Gasoline Range		mg/kg	NA	NA	NA	270HY	NA
Stoddard Solvent Range		mg/kg	NA	NA	NA	130Y	NA
Total Extractable Hydrocarbons							
Diesel Range	*46,000*	mg/kg	NA	NA	NA	NA	NA
Motor Oil Range		mg/kg	NA	NA	NA	NA	NA
Bunker C Range	*46,000*	mg/kg	NA	NA	NA	NA	NA
VOCs (EPA 8021)							
Benzene		ug/kg	NA	NA	NA	57C	NA
Toluene		ug/kg	NA	NA	NA	180C	NA
Ethylbenzene		ug/kg	NA	NA	NA	2,300	NA
m,p-Xylenes		ug/kg	NA	NA	NA	1,400	NA
o-Xylenes		ug/kg	NA	NA	NA	810	NA
HVOCs** (EPA 8260)							
1,2,4-Trimethylbenzene		ug/kg	NA	NA	NA	2,400	NA
1,3,5-Trimethylbenzene		ug/kg	NA	NA	NA	650	NA
Acetone		ug/kg	NA	NA	NA	<1000	NA
Ethylbenzene		ug/kg	NA	NA	NA	1,500	NA
Isopropylbenzene		ug/kg	NA	NA	NA	350	NA
m,p-Xylenes		ug/kg	NA	NA	NA	1,100	NA
Napthalene		ug/kg	NA	NA	NA	3,000	NA
n-Butylbenzene		ug/kg	NA	NA	NA	620	NA
o-Xylenes		ug/kg	NA	NA	NA	200J	NA
para-Isopropyl Toluene		ug/kg	NA	NA	NA	220J	NA
Propylbenzene		ug/kg	NA	NA	NA	710	NA
sec-Butylbenzene		ug/kg	NA	NA	NA	330	NA
Tetrachloroethene		ug/kg	NA	NA	NA	<250	NA
Toluene		ug/kg	NA	NA	NA	200J	NA
Trichloroethene		ug/kg	NA	NA	NA	<250	NA
Semivolatile Organics** (EPA 8270)							
2-Methylnaphthalene	*216,236,000*	ug/kg	NA	NA	NA	NA	NA
TITLE 26 Metals							
Antimony	*1,658*	mg/kg	<3	6.0	<3	NA	<2.9
Arsenic	*19*	mg/kg	20.0	5.2	2.6	NA	2.7
Barium	*290,217*	mg/kg	130.0	36.0	69.0	NA	67.0
Beryllium		mg/kg	<0.099	<0.1	0.2	NA	0.2
Cadmium	*2,073*	mg/kg	2.9	0.9	1.4	NA	1.7
Chromium (total)		mg/kg	24.0	20.0	19.0	NA	45.0
Cobalt		mg/kg	2.7	1.7	3.9	NA	7.3
Copper		mg/kg	470.0	130.0	37.0	NA	17.0
Lead	*2,464*	mg/kg	110.0	1,100.0	200.0	NA	55.0
Molybdenum		mg/kg	<0.99	<1	<0.99	NA	<0.97
Nickel		mg/kg	68.0	8.8	25.0	NA	37.0
Selenium		mg/kg	0.5	<0.25	<0.25	NA	<0.24
Silver	*90,603*	mg/kg	<0.25	<0.25	0.4	NA	<0.24
Thallium		mg/kg	<0.25	<0.25	0.3	NA	0.5
Vanadium		mg/kg	54.0	6.6	15.0	NA	33.0
Zinc		mg/kg	29.0	100.0	120.0	NA	57.0
Mercury (EPA 7470)		mg/kg	0.3	0.2	0.3	NA	0.1
Lead (STLC - EPA 6010B)		ug/L	NA	26.0	NA	NA	NA
Other							
Herbicides (EPA 8151A)		ug/kg	ND	ND	ND	NA	ND
Pesticides/PCBs (EPA 8081A/8082)		ug/kg	ND	ND	ND	NA	ND
96 hour LC50 Bioassay			NA	NA	NA	NA	NA

Notes:

*RAO = Soil Remedial Action Objective is listed for Base Case only is for Commercial Maintenance Worker (see Table 1).

Bold entry indicates exceedence of Base Case RAO.

**Only compounds with detections above reporting limits are listed for VOCs and SVOCs.

NA - Not analyzed or not applicable.

NS - Elevation not surveyed; see report for coordinates.

NR - No recovery.

ug/kg - micrograms per kilogram

mg/kg - milligrams per kilogram

< less than (not detected at or above this value)

Y - sample exhibits pattern which does not resemble standard

H - heavier hydrocarbons than indicated on standard

L - lighter hydrocarbons than indicated on standard

J - estimated value

Table 2
Soil Investigation Results
May to June 2000
Southern Area, Former Bayshore Railyard (OU-2)
Brisbane, California
Sunquest Properties, Inc.

Sample Name			R-114_SC	R-114_Comp	R-115_SC	R-115_Comp	R-116_SC
Ground Surface Elevation			6.70	6.70	7.91	7.91	9.19
Bay Mud Depth	RAO*		8.5	8.5	7.5	7.5	6
Sample Depth (ft)	Base Case		6.5 - 7.0	Composite	3.3 - 3.8	Composite	5.7 - 6.0
Sampling Date	(Commercial		6/14/00	6/14/00	6/14/00	6/14/00	6/14/00
Laboratory Episode Number	Maint. Worker)		146124-014	146124-015		146124-004	
Parameter		Units					
Total Volatile Hydrocarbons							
Gasoline Range		mg/kg	230HY	NA	8.4HY	NA	22HY
Stoddard Solvent Range		mg/kg	110Y	NA	4.2Y	NA	11Y
Total Extractable Hydrocarbons							
Diesel Range	46,000	mg/kg	NA	NA	NA	NA	NA
Motor Oil Range		mg/kg	NA	NA	NA	NA	NA
Bunker C Range	46,000	mg/kg	NA	NA	NA	NA	NA
VOCs (EPA 8021)							
Benzene		ug/kg	<50	NA	<4.5	NA	5.0U
Toluene		ug/kg	260	NA	<4.5	NA	5.0U
Ethylbenzene		ug/kg	910	NA	<4.5	NA	5.0U
m,p-Xylenes		ug/kg	1,400	NA	<4.5	NA	5.0U
o-Xylenes		ug/kg	1,300	NA	<4.5	NA	5.0U
HVOCs** (EPA 8260)							
1,2,4-Trimethylbenzene		ug/kg	2,100	NA	<25	NA	<130
1,3,5-Trimethylbenzene		ug/kg	640	NA	<25	NA	<130
Acetone		ug/kg	<1000	NA	<100	NA	<500
Ethylbenzene		ug/kg	410	NA	<25	NA	<130
Isopropylbenzene		ug/kg	240J	NA	<25	NA	<130
m,p-Xylenes		ug/kg	1,000	NA	<25	NA	<130
Napthalene		ug/kg	3,200	NA	59	NA	<130
n-Butylbenzene		ug/kg	<250	NA	<25	NA	<130
o-Xylenes		ug/kg	700	NA	<25	NA	<130
para-Isopropyl Toluene		ug/kg	490	NA	<25	NA	<130
Propylbenzene		ug/kg	370	NA	<25	NA	<130
sec-Butylbenzene		ug/kg	260	NA	<25	NA	<130
Tetrachloroethene		ug/kg	<250	NA	<25	NA	<130
Toluene		ug/kg	250	NA	<25	NA	<130
Trichloroethene		ug/kg	<250	NA	<25	NA	<130
Semivolatile Organics** (EPA 8270)							
2-Methylnaphthalene	216,236,000	ug/kg	NA	NA	NA	NA	NA
TITLE 26 Metals							
Antimony	1,658	mg/kg	NA	<2.9	NA	<3	NA
Arsenic	19	mg/kg	NA	34.0	NA	4.3	NA
Barium	290,217	mg/kg	NA	68.0	NA	30.0	NA
Beryllium		mg/kg	NA	0.1	NA	0.3	NA
Cadmium	2,073	mg/kg	NA	2.1	NA	2.1	NA
Chromium (total)		mg/kg	NA	19.0	NA	49.0	NA
Cobalt		mg/kg	NA	6.5	NA	9.7	NA
Copper		mg/kg	NA	75.0	NA	25.0	NA
Lead	2,464	mg/kg	NA	110.0	NA	22.0	NA
Molybdenum		mg/kg	NA	<0.98	NA	<1	NA
Nickel		mg/kg	NA	24.0	NA	62.0	NA
Selenium		mg/kg	NA	<0.25	NA	<0.25	NA
Silver	90,603	mg/kg	NA	0.3	NA	<0.25	NA
Thallium		mg/kg	NA	0.5	NA	0.7	NA
Vanadium		mg/kg	NA	35.0	NA	28.0	NA
Zinc		mg/kg	NA	150.0	NA	50.0	NA
Mercury (EPA 7470)		mg/kg	NA	0.1	NA	0.2	NA
Lead (STLC - EPA 6010B)		ug/L	NA	NA	NA	NA	NA
Other							
Herbicides (EPA 8151A)		ug/kg	NA	ND	NA	ND	NA
Pesticides/PCBs (EPA 8081A/8082)		ug/kg	NA	ND	NA	ND	NA
96 hour LC50 Bioassay			NA	NA	NA	NA	NA

Notes:

*RAO = Soil Remedial Action Objective is listed for Base Case only is for Commercial Maintenance Worker (see Table 1).

Bold entry indicates exceedence of Base Case RAO.

**Only compounds with detections above reporting limits are listed for VOCs and SVOCs.

NA - Not analyzed or not applicable.

NS - Elevation not surveyed; see report for coordinates.

NR - No recovery.

ug/kg - micrograms per kilogram

mg/kg - milligrams per kilogram

< less than (not detected at or above this value)

Y - sample exhibits pattern which does not resemble standard

H - heavier hydrocarbons than indicated on standard

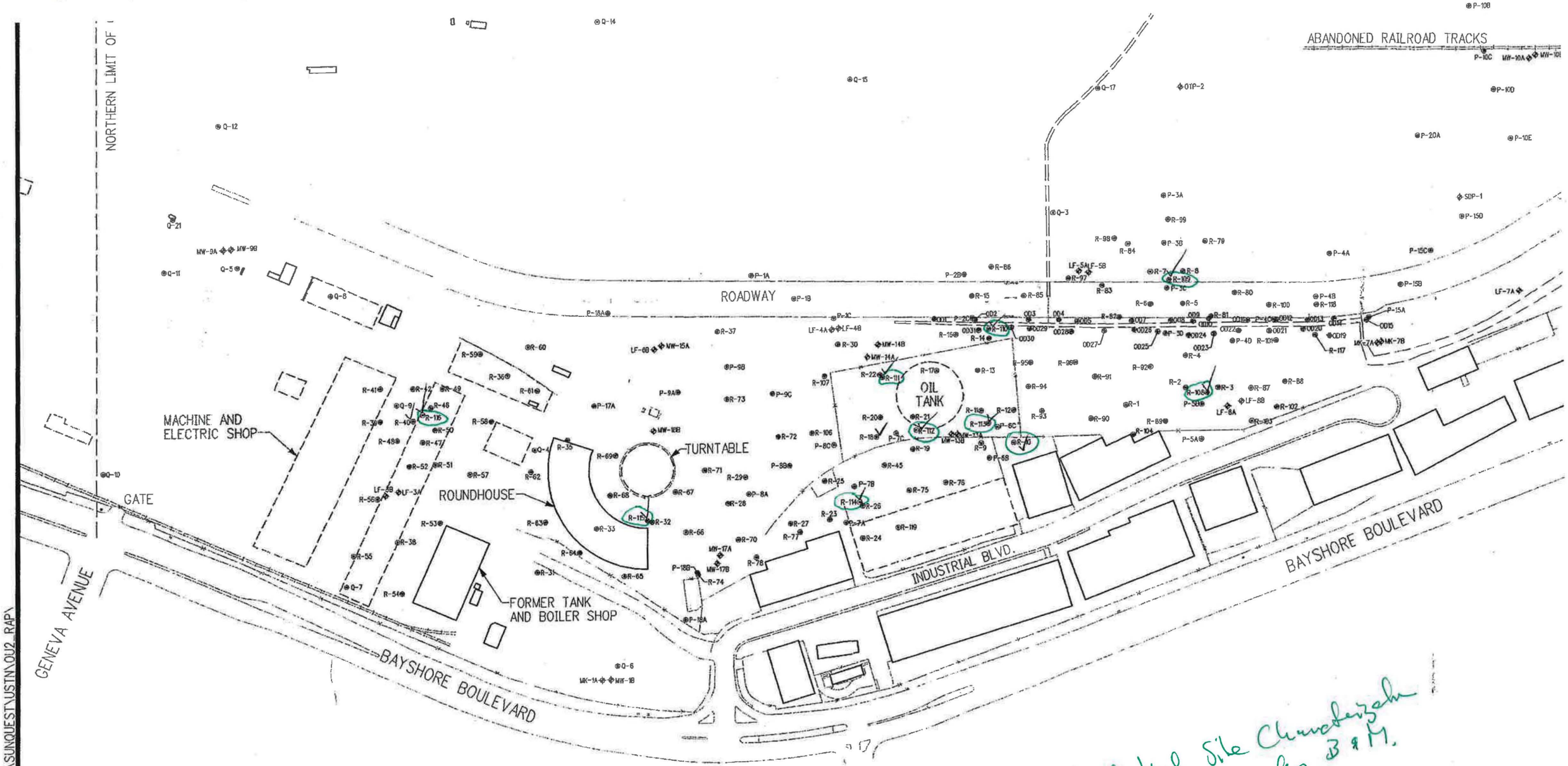
L - lighter hydrocarbons than indicated on standard

J - estimated value

Table 2
Soil Investigation Results
May to June 2000
Southern Area, Former Bayshore Railyard (OU-2)
Brisbane, California
Sunquest Properties, Inc.

Sample Name			R-116_Comp	R-117A_SC	R-118_SC	R-119_SC
Ground Surface Elevation			9.19	7.66	8.14	7.81
Bay Mud Depth	*RAO**		6	11	7	6.5
Sample Depth (ft)	*Base Case*		Composite	6.0 - 7.0	6.5 - 7.0	5.6 - 6.0
Sampling Date	*(Commercial*		6/14/00	6/9/00	6/9/00	6/9/00
Laboratory Episode Number	*Maint. Worker)*		146124-002	146036-001	146036-002	146036-007
Parameter		Units				
Total Volatile Hydrocarbons						
Gasoline Range		mg/kg	NA	NA	NA	NA
Stoddard Solvent Range		mg/kg	NA	NA	NA	NA
Total Extractable Hydrocarbons						
Diesel Range	*46,000*	mg/kg	NA	4,500HY	25,000HY	31,000HY
Motor Oil Range		mg/kg	NA	NA	NA	NA
Bunker C Range	*46,000*	mg/kg	NA	19,000Y	110,000Y	140,000Y
VOCs (EPA 8021)						
Benzene		ug/kg	NA	NA	NA	NA
Toluene		ug/kg	NA	NA	NA	NA
Ethylbenzene		ug/kg	NA	NA	NA	NA
m,p-Xylenes		ug/kg	NA	NA	NA	NA
o-Xylenes		ug/kg	NA	NA	NA	NA
HVOCs** (EPA 8260)						
1,2,4-Trimethylbenzene		ug/kg	NA	NA	NA	NA
1,3,5-Trimethylbenzene		ug/kg	NA	NA	NA	NA
Acetone		ug/kg	NA	NA	NA	NA
Ethylbenzene		ug/kg	NA	NA	NA	NA
Isopropylbenzene		ug/kg	NA	NA	NA	NA
m,p-Xylenes		ug/kg	NA	NA	NA	NA
Napthalene		ug/kg	NA	NA	NA	NA
n-Butylbenzene		ug/kg	NA	NA	NA	NA
o-Xylenes		ug/kg	NA	NA	NA	NA
para-Isopropyl Toluene		ug/kg	NA	NA	NA	NA
Propylbenzene		ug/kg	NA	NA	NA	NA
sec-Butylbenzene		ug/kg	NA	NA	NA	NA
Tetrachloroethene		ug/kg	NA	NA	NA	NA
Toluene		ug/kg	NA	NA	NA	NA
Trichloroethene		ug/kg	NA	NA	NA	NA
Semivolatile Organics** (EPA 8270)						
2-Methylnaphthalene	*216,236,000*	ug/kg	NA	NA	NA	NA
TITLE 26 Metals						
Antimony	*1,658*	mg/kg	<2.9	NA	NA	NA
Arsenic	*19*	mg/kg	2.8	NA	NA	NA
Barium	*290,217*	mg/kg	33.0	NA	NA	NA
Beryllium		mg/kg	0.2	NA	NA	NA
Cadmium	*2,073*	mg/kg	2.5	NA	NA	NA
Chromium (total)		mg/kg	220.0	NA	NA	NA
Cobalt		mg/kg	32.0	NA	NA	NA
Copper		mg/kg	16.0	NA	NA	NA
Lead	*2,464*	mg/kg	6.2	NA	NA	NA
Molybdenum		mg/kg	<0.97	NA	NA	NA
Nickel		mg/kg	550.0	NA	NA	NA
Selenium		mg/kg	<0.24	NA	NA	NA
Silver	*90,603*	mg/kg	<0.24	NA	NA	NA
Thallium		mg/kg	0.7	NA	NA	NA
Vanadium		mg/kg	22.0	NA	NA	NA
Zinc		mg/kg	31.0	NA	NA	NA
Mercury (EPA 7470)		mg/kg	0.0	NA	NA	NA
Lead (STLC - EPA 6010B)		ug/L	NA	NA	NA	NA
Other						
Herbicides (EPA 8151A)		ug/kg	ND	NA	NA	NA
Pesticides/PCBs (EPA 8081A/8082)		ug/kg	ND	NA	NA	NA
96 hour LC50 Bioassay			NA	NA	NA	NA

Notes:
*RAO = Soil Remedial Action Objective is listed for Base Case only
is for Commercial Maintenance Worker (see Table 1).
Bold entry indicates exceedence of Base Case RAO.
**Only compounds with detections above reporting limits
are listed for VOCs and SVOCs.
NA - Not analyzed or not applicable.
NS - Elevation not surveyed; see report for coordinates.
NR - No recovery.
ug/kg - micrograms per kilogram
mg/kg - milligrams per kilogram
< less than (not detected at or above this value)
Y - sample exhibits pattern which does not resemble standard
H - heavier hydrocarbons than indicated on standard
L - lighter hydrocarbons than indicated on standard
J - estimated value



Additional Site Characterization by J & M. 1997

SUNQSITE.DGN/ 8-14-2001 12:53/FB K:\SUNQUEST\UST\OU2.RAP\

CALTRAIN RAILROAD TRACKS

CALTRAIN RAILROAD TRACKS

NORTHERN LIMIT OF OPERABLE UNIT-2

ABANDONED RAILROAD TRACKS

DRAINAGE CHANNEL

ROADWAY

OIL TANK

TURNTABLE

ROUNDHOUSE

MACHINE AND ELECTRIC SHOP

GATE

FORMER TANK AND BOILER SHOP

INDUSTRIAL BLVD.

GENEVA AVENUE

BAYSHORE BOULEVARD

BAYSHORE BOULEVARD

LEGEND

- GEOPROBE LOCATION (BMWCI 1997)
- GEOPROBE LOCATION (BMWCI 1999)
- GEOPROBE LOCATION (BMWCI 2000)
- BORING LOCATION (BY OTHERS)
- MONITORING WELL LOCATION
- EXISTING STRUCTURE
- FORMER STRUCTURE
- FENCE
- DRAINAGE CHANNEL

NORTH

200' 0' 200' 400'

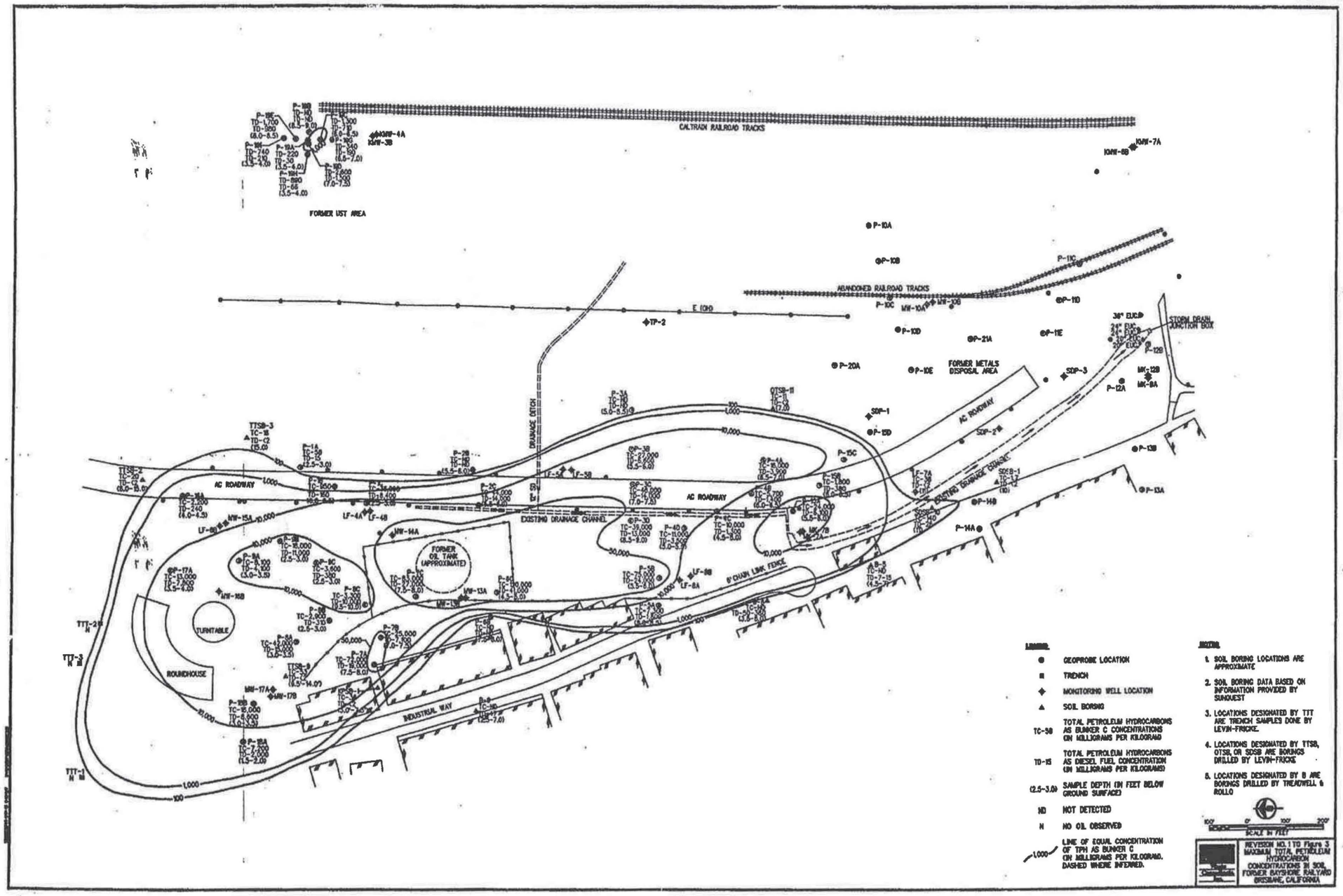
SCALE IN FEET

Burns & McDonnell Waste Consultants, Inc.

Figure 2

SITE PLAN
SUNQUEST PROPERTIES, INC.
BRISBANE, CA

SUNSITE.DGN/ 8-14-2001 12:53/ER K:\SUNQUEST\STNAOU2.RAP\


CALTRAIN RAILROAD TRACKS
FORMER UST AREA
KMW-4A
KMW-3B
KMW-8B
KMW-7A
P-10A
P-10B
P-10C
P-10D
P-10E
P-11C
P-11E
P-12A
P-12B
P-13A
P-13B
P-13C
P-14A
P-14B
P-15C
P-15D
P-20A
P-21A
MW-10A
MW-10B
ABANDONED RAILROAD TRACKS
E ICHO
TP-2
36" EUC
24" EUC
24" RCP
24" EUC
STORM DRAIN JUNCTION BOX
FORMER METALS DISPOSAL AREA
SDP-3
SDP-1
SDP-2
AC ROADWAY
DRAINAGE DITCH
EXISTING DRAINAGE CHANNEL
EXISTING DRAINAGE CHANNEL
MW-12B
MW-8A
MW-7B
SDSB-1
TTSB-3
TTSB-2
TTSB-1
OTSB-11
LF-5
LF-4A
LF-4B
LF-8A
LF-8B
MW-15A
MW-14A
MW-13A
MW-13B
MW-17A
MW-17B
FORMER OIL TANK (APPROXIMATE)
6' CHAIN LINK FENCE
TURNTABLE
ROUNDHOUSE
INDUSTRIAL WAY
TTT-2
TTT-3
TTT-1
10,000
50,000
1,000
100
LEGEND
GEOPROBE LOCATION
TRENCH
MONITORING WELL LOCATION
SOIL BORING
TC-58 TOTAL PETROLEUM HYDROCARBONS AS BUNKER C CONCENTRATIONS ON MILLIGRAMS PER KILOGRAM
TD-15 TOTAL PETROLEUM HYDROCARBONS AS DIESEL FUEL CONCENTRATION ON MILLIGRAMS PER KILOGRAMS
(2.5-3.0) SAMPLE DEPTH (IN FEET BELOW GROUND SURFACE)
ND NOT DETECTED
N NO OIL OBSERVED
1,000 LINE OF EQUAL CONCENTRATION OF TPH AS BUNKER C ON MILLIGRAMS PER KILOGRAM. DASHED WHERE INFERRED.
NOTES
1. SOIL BORING LOCATIONS ARE APPROXIMATE
2. SOIL BORING DATA BASED ON INFORMATION PROVIDED BY SUNQUEST
3. LOCATIONS DESIGNATED BY TTT ARE TRENCH SAMPLES DONE BY LEVIN-FRICKE.
4. LOCATIONS DESIGNATED BY TTSB, OTSB, OR SDSB ARE BORINGS DRILLED BY LEVIN-FRICKE
5. LOCATIONS DESIGNATED BY B ARE BORINGS DRILLED BY TREADWELL & ROLLO
100' 0' 100' 200'
SCALE IN FEET
REVISION NO. 1 TO Figure 3
MAXIMUM TOTAL PETROLEUM HYDROCARBON CONCENTRATIONS IN SOIL
FORMER BAYSHORE RAILYARD
BRISBANE, CALIFORNIA

CALTRAIN RAILROAD TRACKS

CALTRAIN RAILROAD TRACKS

NORTHERN LIMIT OF OPERABLE UNIT-2

ABANDONED RAILROAD TRACKS

ROADWAY

DRAINAGE CHANNEL

DRAINAGE CHANNEL

TRANSFER PIT

MACHINE AND ELECTRIC SHOP

GATE

FORMER TANK AND BOILER SHOP

ROUNDHOUSE

TURNTABLE

OIL TANK

INDUSTRIAL BLVD.

BAYSHORE BOULEVARD

GENEVA AVENUE

DRAFT

LEGEND

- GEOPROBE LOCATION (BMWCI 1997)
- GEOPROBE LOCATION (BMWCI 1999)
- GEOPROBE LOCATION (BMWCI 2000)
- MONITORING WELL LOCATION
- LEAD CONCENTRATION IN EXCEEDENCE OF BASE CASE RAO OF 2,500 mg/Kg
- LEAD CONCENTRATION IN EXCEEDENCE OF UTILITY WORKER RAO OF 132 mg/Kg
- 3,800 LEAD CONCENTRATION (mg/Kg)
- EXISTING STRUCTURE
- FORMER STRUCTURE
- FENCE
- DRAINAGE CHANNEL

NOTE

Metals analyses in May to June 2000 included Antimony, Arsenic, Barium, Beryllium, Cadmium, Cobalt, Copper, Lead, Molybdenum, Nickel, Selenium, Silver, Thallium, Vanadium, and Zinc. See Table 2 for other detections.

NORTH

200' 0' 200' 400'

SCALE IN FEET

Burns & McDonnell Waste Consultants, Inc.

Figure 4

LEAD IMPACTED AREAS
A-FILL ZONE SOIL
SUNQUEST PROPERTIES, INC.
BRISBANE, CA

SUNQLEAD.DGN/ 5-01-2001 12:22:28 KAS/SUNQUEST/USTN/DGN/2 RAP

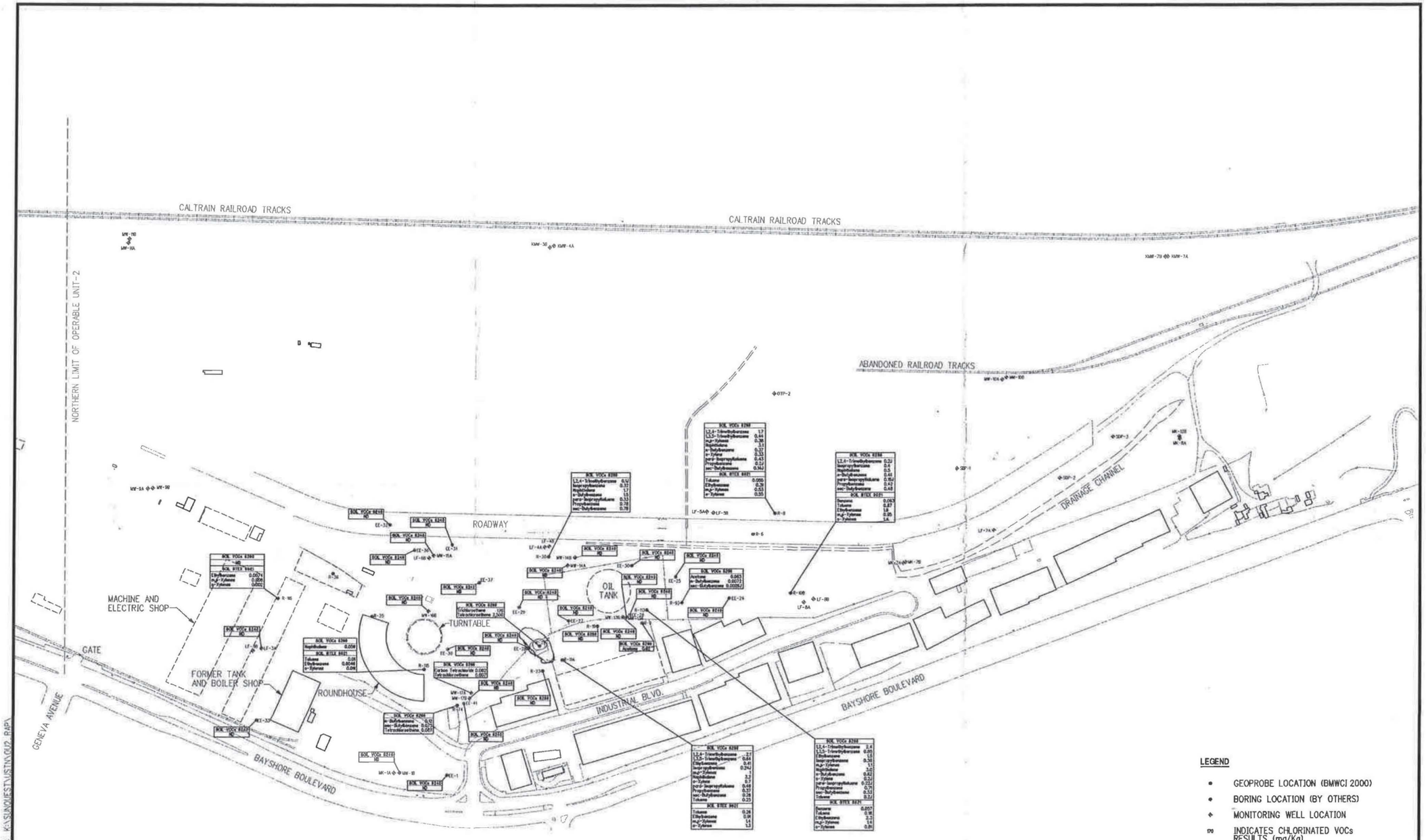


Figure 5
VOCs RESULTS
A-FILL ZONE
SUNQUEST PROPERTIES, INC.
BRISBANE, CA

McDonnell Waste Consultants, Inc.

K:\UNITED\STDUNTN\SUP\MISC\VOCS\01-DFT-1.DF
K:\UNITED\STDUNTN\SUP\SUNVOCS.DGN/ 8-14-2001 13:30/FB K:\SUNQUEST\STDUNTN\SUP\SUNVOCS.DGN/ 8-14-2001 13:30/FB

CALTRAIN RAILROAD TRACKS

CALTRAIN RAILROAD TRACKS

NORTHERN LIMIT OF OPERABLE UNIT-2

ABANDONED RAILROAD TRACKS

DRAINAGE CHANNEL

ROADWAY

OIL TANK

MACHINE AND ELECTRIC SHOP

TURNTABLE

ROUNDHOUSE

GATE

FORMER TANK AND BOILER SHOP

GENEVA AVENUE

BAYSHORE BOULEVARD

INDUSTRIAL BLVD.

BAYSHORE BOULEVARD

LEGEND

- GEOPROBE LOCATION (BMWCI 1997)
- GEOPROBE LOCATION (BMWCI 1999)
- GEOPROBE LOCATION (BMWCI 2000)
- GEOPROBE LOCATION
- MONITORING WELL LOCATION
- CONTOUR FOR APPROXIMATE ELEVATION OF TOP OF BAYMUD (FEET ABOVE MEAN SEA LEVEL)
- EXISTING STRUCTURE
- FORMER STRUCTURE
- FENCE
- DRAINAGE CHANNEL

NORTH

200' 0' 200' 400'

SCALE IN FEET

Burns & McDonnell Waste Consultants, Inc.

Figure 6

BAYMUD ELEVATION
SUNQUEST PROPERTIES, INC.
BRISBANE, CA

K:\SUNQUEST\USTIN\LOI\2.RAP\SUNBASE DGN 07-13-4 13:35:16 22-24 29 33-35 42-43 45-47 51-58

SUNMUD.DGN/ 8-14-2001 13:11/FB K:\SUNQUEST\USTIN\LOI\2.RAP\

INVESTIGATION REPORT
CHLORINATED SOLVENTS

South Area, Former Bayshore Railyard
Brisbane, California

Prepared For:

Sunquest Properties, Inc.
150 Executive Park Blvd., Suite 4200
San Francisco, California, 94134

May 2002

Prepared By:

Burns & McDonnell Engineering Company, Inc.
Engineers-Geologists-Scientists
South San Francisco, California

Table 1a
SUMMARY OF VOC ANALYTICAL DATA
(S-series Soil)
Former Bayshore Railyard (OU-2)
Sunquest Properties, Inc.

Sample ID:		S-1	S-2	S-3	S-4	S-5	S-6	S-7	S-8	S-9
Sample Depth (ft):		8.5	8.0	5.5	6.0	4.0	7.0	6.5	6.0	5.0
Bay Mud Depth (ft):		NA	9.2	NA	NA	5.0	8.0	7.0	7.0	5.5
Date Sampled:		11/08/00	11/08/00	11/08/00	11/08/00	11/08/00	11/8/2000	11/08/00	11/08/00	11/08/00
Laboratory ID:		148622-005	148622-006	148622-004	148622-010	148622-009	148622-012	148622-001	148622-011	148622-008
Parameter	**Units**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**
EPA 8260B (detections only)										
Vinyl Chloride	mg/Kg	0.025 U	0.017 U	0.01 U	0.25 U	0.05 U	0.0096 U	0.0093 U	0.4 U	33 U
Methylene Chloride	mg/Kg	**0.061**	0.033 U	0.02 U	0.5 U	0.1 U	0.019 U	**0.028**	0.8 U	67 U
cis-1,2-Dichloroethene	mg/Kg	0.013 U	0.0083 U	0.0051 U	0.13 U	0.025 U	0.0048 U	0.0046 U	0.2 U	**240**
Trichloroethene	mg/Kg	0.013 U	0.0083 U	0.0051 U	0.13 U	0.025 U	0.0048 U	0.0046 U	0.2 U	**100**
Tetrachloroethene	mg/Kg	0.013 U	0.0083 U	0.0051 U	0.13 U	0.025 U	0.0048 U	0.0046 U	0.2 U	**650**
m,p-Xylenes	mg/Kg	0.013 U	0.0083 U	0.0051 U	0.13 U	0.025 U	0.0048 U	0.0046 U	**0.78**	17 U
o-Xylene	mg/Kg	0.013 U	0.0083 U	0.0051 U	0.13 U	0.025 U	0.0048 U	0.0046 U	**0.49**	17 U
Isopropylbenzene	mg/Kg	0.013 U	0.0083 U	0.0051 U	0.13 U	0.025 U	0.0048 U	0.0046 U	**0.27**	17 U
Propylbenzene	mg/Kg	0.013 U	0.0083 U	0.0051 U	0.13 U	0.025 U	0.0048 U	0.0046 U	**0.42**	17 U
1,3,5-Trimethylbenzene	mg/Kg	0.013 U	0.0083 U	0.0051 U	0.13 U	0.025 U	0.0048 U	0.0046 U	**0.63**	17 U
1,2,4-Trimethylbenzene	mg/Kg	0.013 U	0.0083 U	0.0051 U	0.13 U	0.025 U	0.0048 U	0.0046 U	**2.4**	17 U
sec-Butylbenzene	mg/Kg	0.013 U	0.0083 U	0.0051 U	0.13 U	0.025 U	0.0048 U	0.0046 U	**0.34**	17 U
para-Isopropyl Toluene	mg/Kg	0.013 U	0.0083 U	0.0051 U	0.13 U	0.025 U	0.0048 U	0.0046 U	**0.67**	17 U
n-Butylbenzene	mg/Kg	0.013 U	0.0083 U	0.0051 U	**0.2**	0.025 U	0.0048 U	0.0046 U	**0.69**	17 U
Naphthalene	mg/Kg	0.013 U	0.0083 U	0.0051 U	**0.15**	0.025 U	0.0048 U	0.0046 U	**5**	10 U

EPA 8260B detections reported only; refer to the laboratory report for the complete list of analytes.
U - Qualified by the analytical laboratory as not detected above the indicated detection limit.
J - Qualified as estimated by the analytical laboratory.
mg/Kg - Milligrams per kilogram
NA - Not analyzed

Table 1a
SUMMARY OF VOC ANALYTICAL DATA
(S-series Soil)
Former Bayshore Railyard (OU-2)
Sunquest Properties, Inc.

Sample ID:		S-10	S-11	S-13	S-14	S-15	S-16	S-17	S-18	S-19	S-20
Sample Depth (ft):		5.5	0.5	5.0	8.5	11.0	6.5	7.5	7.5	7.5	15.5
		NA	4.0	NA	10.0	12.0	7.0	8.0	8.0	8.0	16.0
Date Sampled:		11/08/00	11/08/00	11/08/00	06/15/01	06/19/01	06/19/01	06/19/01	06/19/01	06/19/01	06/19/01
Laboratory ID:		148622-002	148622-003	148622-007	152588-001	152649-001	152649-003	152649-005	152649-007	152649-009	152649-010
Parameter	**Units**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**
EPA 8260B (detections only)											
Vinyl Chloride	mg/Kg	**0.0097**	330 U	0.25 U	0.01 U	0.01 U	0.0096 U	0.01 U	0.0096 U	0.0096 U	0.0098 U
Methylene Chloride	mg/Kg	**0.021**	670 U	0.5 U	0.02 U	0.02 U	0.019 U	0.02 U	0.019 U	0.019 U	0.02 U
cis-1,2-Dichloroethene	mg/Kg	**0.0053**	170 U	0.13 U	0.005 U	0.005 U	0.0048 U	0.005 U	0.0048 U	0.0048 U	0.0049 U
Trichloroethene	mg/Kg	0.0048 U	170 U	0.13 U	0.005 U	0.005 U	0.0048 U	0.005 U	0.0048 U	0.0048 U	0.0049 U
Tetrachloroethene	mg/Kg	0.0048 U	**4,500**	0.13 U	0.005 U	0.005 U	0.0048 U	0.005 U	0.0048 U	**0.0058**	0.0049 U
m,p-Xylenes	mg/Kg	0.0048 U	170 U	0.13 U	NA	NA	NA	NA	NA	NA	NA
o-Xylene	mg/Kg	0.0048 U	170 U	**0.13**	NA	NA	NA	NA	NA	NA	NA
Isopropylbenzene	mg/Kg	0.0048 U	170 U	0.13 U	NA	NA	NA	NA	NA	NA	NA
Propylbenzene	mg/Kg	0.0048 U	170 U	0.13 U	NA	NA	NA	NA	NA	NA	NA
1,3,5-Trimethylbenzene	mg/Kg	0.0048 U	170 U	0.25	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trimethylbenzene	mg/Kg	0.0048 U	170 U	0.6	NA	NA	NA	NA	NA	NA	NA
sec-Butylbenzene	mg/Kg	0.0048 U	170 U	**0.15**	NA	NA	NA	NA	NA	NA	NA
para-Isopropyl Toluene	mg/Kg	0.0048 U	170 U	**0.19**	NA	NA	NA	NA	NA	NA	NA
n-Butylbenzene	mg/Kg	0.0048 U	170 U	**0.22**	NA	NA	NA	NA	NA	NA	NA
Naphthalene	mg/Kg	0.0048 U	170 U	**0.5**	NA	NA	NA	NA	NA	NA	NA

EPA 8260B detections reported only; refer to the laboratory report for the complete list of analytes.
U - Qualified by the analytical laboratory as not detected above the indicated detection limit.
J - Qualified as estimated by the analytical laboratory.
mg/Kg - Milligrams per kilogram
NA - Not analyzed
Boring SA-12 met refusal and no samples were collected for analysis.

TABLE 1b
SUMMARY OF VOCs ANALYTICAL DATA
(R-series Soil)
Former Bayshore Railyard (OU-2)
Sunquest Properties, Inc.

Sample ID:		R-25A_SC	R-74A_SC	R-114_SC
Sample Depth (ft):		3.2 - 3.7	2.0 - 2.6	6.5 - 7.0
Bay Mud Depth (ft):		7.1	refusal at 8.3	8.5
Date Sampled:		06/06/00	06/06/00	06/14/00
Laboratory ID:		146015-002	146016-007	146124-014
Parameter	**Units**	**Result**	**Result**	**Result**
EPA 8260B (detections only)				
Acetone	mg/kg	500 U	0.1 U	1 U
Trichloroethene	mg/kg	**170**	0.025 U	0.25 U
Toluene	mg/kg	130 U	0.025 U	**0.25**
Tetrachloroethene	mg/kg	**2,500**	**0.087**	0.25 U
Ethylbenzene	mg/kg	130 U	0.025 U	**0.41**
m,p-Xylenes	mg/kg	130 U	0.025 U	**1**
o-Xylene	mg/kg	130 U	0.025 U	**0.7**
Isopropylbenzene	mg/kg	130 U	0.025 U	**0.24 J**
Propylbenzene	mg/kg	130 U	0.025 U	**0.37**
1,3,5-Trimethylbenzene	mg/kg	130 U	0.025 U	**0.64**
1,2,4-Trimethylbenzene	mg/kg	130 U	0.025 U	**2.1**
para-Isopropyl Toluene	mg/kg	130 U	0.025 U	**0.49**
sec-Butylbenzene	mg/kg	130 U	**0.073**	**0.26**
n-Butylbenzene	mg/kg	130 U	**0.12**	0.25 U
Naphthalene	mg/kg	130 U	0.025 U	**3.2**

EPA 8260B detections reported only; refer to the laboratory report for the complete list of analytes.

U - Qualified by the analytical laboratory as not detected above the indicated detection limit.

J - Qualified as estimated by the analytical laboratory.

mg/kg - Milligrams per kilogram

NA - Not analyzed

Selected R-series samples shown. See *Investigation Report Supplemental Bunker C Delineation*, dated August 2001 for other R-series boring results.

Table 2
SUMMARY OF VOC ANALYTICAL DATA
(Groundwater)
Former Bayshore Railyard (OU-2)
Sunquest Properties, Inc.

Sample ID:		S-4-GW	S-8-GW	S-9-GW	S-15-GW	S-16-GW	S-17-GW
Date Sampled:		11/08/00	11/09/00	11/08/00	06/19/01	06/19/01	06/19/01
Laboratory ID:		148622-013	148622-014	148622-015	152649-002	152649-004	152649-006
Parameter	**Units**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**
EPA 8260B (detections only)							
Vinyl Chloride	ug/L	10 U	10 U	**9700**	0.5 U	0.5 U	0.5 U
Chloroethane	ug/L	**11**	10 U	710 U	**40**	1 U	1 U
Acetone	ug/L	20 U	**90**	1400 U	NA	NA	NA
trans-1,2-Dichloroethene	ug/L	5 U	5 U	**700**	0.5 U	0.5 U	0.5 U
2-Butanone	ug/L	10 U	**19**	710 U	NA	NA	NA
cis-1,2-Dichloroethene	ug/L	5 U	5 U	**44000**	0.5 U	0.5 U	0.5 U
Benzene	ug/L	0.5 U	**1.7**	36 U	NA	NA	NA
Trichloroethene	ug/L	5 U	5 U	**960**	0.5 U	0.5 U	0.5 U
Toluene	ug/L	0.5 U	**1.4**	36 U	NA	NA	NA
Tetrachloroethene	ug/L	5 U	5 U	**1200**	0.5 U	0.5 U	0.5 U
Ethylbenzene	ug/L	0.5 U	**0.6**	36 U	NA	NA	NA
m,p-Xylenes	ug/L	0.5 U	**3.9**	36 U	NA	NA	NA
o-Xylene	ug/L	0.5 U	**2.6**	36 U	NA	NA	NA
1,2,4-Trimethylbenzene	ug/L	5 U	**5.5**	360 U	NA	NA	NA
Naphthalene	ug/L	5 U	**13**	360 U	NA	NA	NA

EPA 8260B detections reported only; refer to the laboratory report for the complete list of analytes.

S-4, S-8 and S-9 were analyzed for the full EPA 8260B list.

S-15, S16 and S-17 were analyzed for the EPA 8010 list, by EPA Method 8260B.

U - Qualified by the analytical laboratory as not detected above the indicated detection limit.

J - Qualified as estimated by the analytical laboratory.

ug/L - Micrograms per Liter

NA - Not analyzed

ROADWAY

DRAINAGE CHANNEL

DRAINAGE CHANNEL

AC ROADWAY

AC ROADWAY

MACHINE AND ELECTRIC SHOP

ROUNDHOUSE

FORMER TANK AND BOILER SHOP

FORMER CONSOLIDATED CHEMICALS BUILDING

OIL TANK

INACTIVE OIL/WATER SEPARATOR (APPROXIMATE LOCATION)

INDUSTRIAL BLVD.

INDUSTRIAL BLVD.

BAYSHORE BOULEVARD

S-1 SAMPLE DEPTH = 8.5' Methylene Chloride 0.061

S-2 SAMPLE DEPTH = 11.0' BAY MUD DEPTH = 8.3' HVOCs ND

S-3 SAMPLE DEPTH = 5.5' HVOCs ND

S-4 SAMPLE DEPTH = 6.0' n-Butylbenzene 0.3 Naphthalene 0.15

SAMPLE DEPTH = 2.0' REFUSAL AT 8.3' n-Butylbenzene 0.12 sec-Butylbenzene 0.073 Tetrachloroethene 0.087

S-5 SAMPLE DEPTH = 4.0' BAY MUD DEPTH = 5.0' HVOCs ND

R-74

S-6 SAMPLE DEPTH = 7.0' BAY MUD DEPTH = 8.0' HVOCs ND

S-7 SAMPLE DEPTH = 6.5' BAY MUD DEPTH = 7.0' Methylene Chloride 0.078

S-8 SAMPLE DEPTH = 6.5' BAY MUD DEPTH = 9.5'

1,2,4-Trimethylbenzene	2.1
1,3,5-Trimethylbenzene	0.84
Ethylbenzene	0.41
Isopropylbenzene	0.24
m,p-Xylenes	1.0
Naphthalene	3.2
o-Xylene	0.7
para-Isopropyltoluene	0.48
Propylbenzene	0.37
sec-Butylbenzene	0.25
Toluene	0.35

S-9 SAMPLE DEPTH = 8.5' BAY MUD DEPTH = 10.0' HVOCs ND

S-10 SAMPLE DEPTH = 6.5' BAY MUD DEPTH = 7.0' HVOCs ND

S-11 SAMPLE DEPTH = 5.5' Vinyl Chloride 0.0097 Methylene Chloride 0.021 Cis-1,2-Dichloroethene 0.0053

S-12 REFUSAL

S-13 SAMPLE DEPTH = 5.0' BAY MUD DEPTH = 5.5' cis-1,2-Dichloroethene 240 Trichloroethene 100 Tetrachloroethene 650

S-14 SAMPLE DEPTH = 1.0' BAY MUD DEPTH = 4.0' Tetrachloroethene 4,500

S-15 SAMPLE DEPTH = 5.0'

1,2,4-Trimethylbenzene	0.6
1,3,5-Trimethylbenzene	0.25
Naphthalene	0.5
n-Butylbenzene	0.22
o-Xylene	0.13
sec-Butylbenzene	0.15
para-Isopropyltoluene	0.19

S-16 SAMPLE DEPTH = 11.0' BAY MUD DEPTH = 12.0' HVOCs ND

S-17 SAMPLE DEPTH = 7.5' BAY MUD DEPTH = 8.0' HVOCs ND

S-18 SAMPLE DEPTH = 7.5' BAY MUD DEPTH = 8.0' HVOCs ND

S-19 SAMPLE DEPTH = 7.5' BAY MUD DEPTH = 8.0' Tetrachloroethene 0.0056

S-20 SAMPLE DEPTH = 15.5' BAY MUD DEPTH = 16.0' HVOCs ND

R-25 SAMPLE DEPTH = 3.2' BAY MUD DEPTH = 7.7' Trichloroethene 170 Tetrachloroethene 2,500

R-23 SAMPLE DEPTH = 1.4' BAY MUD DEPTH = 9.3' HVOCs ND

R-114 SAMPLE DEPTH = 6.0' BAY MUD DEPTH = 7.0'

m,p-Xylenes	0.78
o-Xylene	0.49
Isopropylbenzene	0.27
Propylbenzene	0.42
1,3,5-Trimethylbenzene	0.83
1,2,4-Trimethylbenzene	2.4
sec-Butylbenzene	0.34
para-Isopropyltoluene	0.87
n-Butylbenzene	0.88
Naphthalene	5.0

LEGEND

- GEOPROBE LOCATION (BMWC) 2000/2001
- 170 INDICATES CHLORINATED VOCs RESULTS (mg/Kg)
- 2.1 INDICATES NON-CHLORINATED VOCs RESULTS (mg/Kg)
- ND(0.5) NOT DETECTED AT SAMPLE DEPTH (BELOW GROUND SURFACE)
- APPROXIMATE AREA OF CHLORINATED VOCs IMPACT IN SOIL
- EXISTING STRUCTURE
- FORMER STRUCTURE
- FENCE
- DRAINAGE CHANNEL

NOTES

1. ANALYSIS METHODS INCLUDED EPA 8260 AND EPA 8021. WHERE COMPOUNDS ARE DETECTED IN BOTH EPA 8260 AND EPA 8021, THE HIGHEST VALUE IS SHOWN.
2. BAY MUD DEPTH IS SHOWN WHERE AVAILABLE.
3. SAMPLE DEPTHS REPRESENT THE TOP OF THE SAMPLE SECTION.
4. SELECTED R-SERIES BORING SHOWN. SEE "INVESTIGATION REPORT SUPPLEMENTAL BUNKER C DELINEATION" DATED AUGUST 2001 FOR OTHER R-SERIES RESULTS.

NORTH

100' 0' 100' 200'

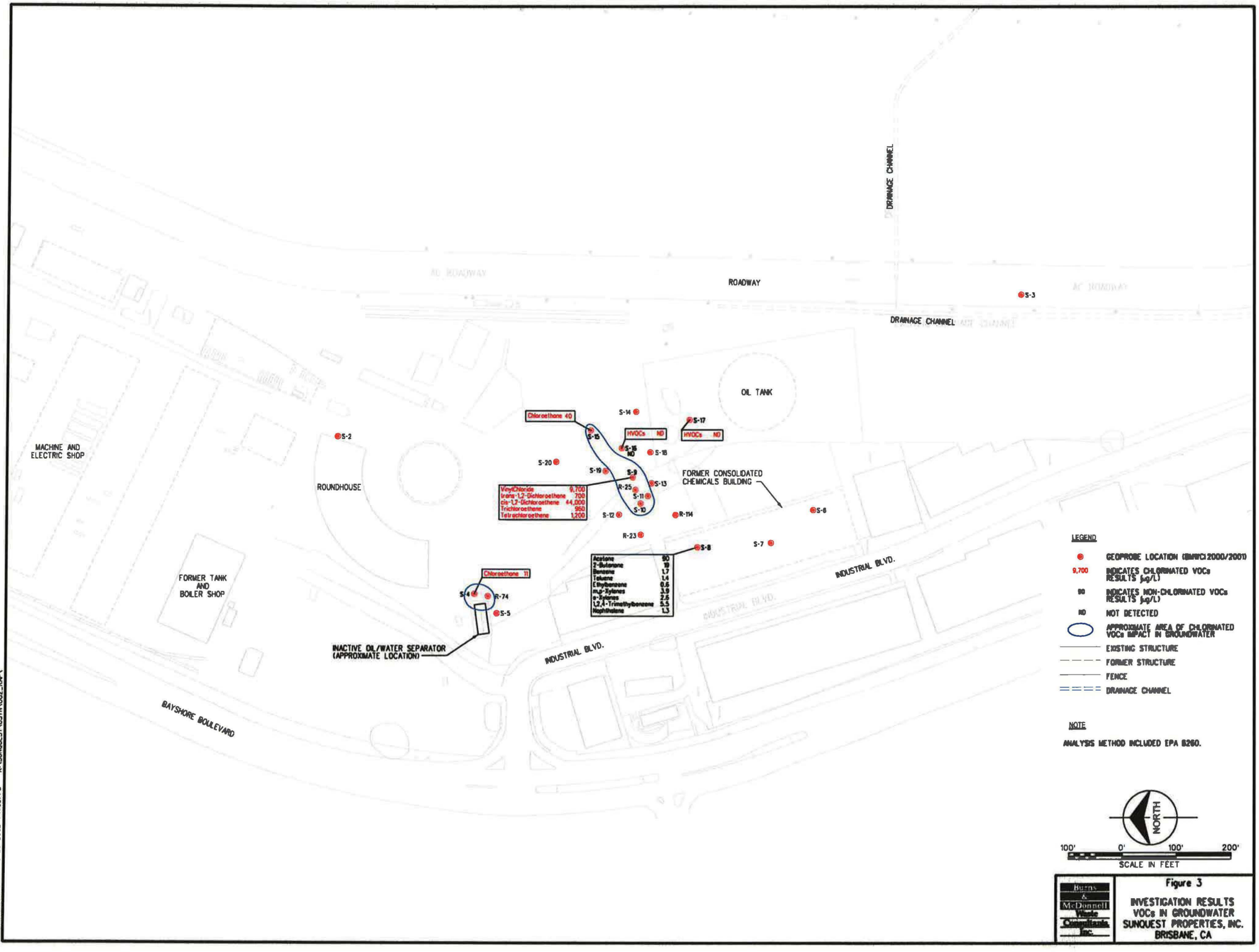
SCALE IN FEET

Figure 2

INVESTIGATION RESULTS VOCs IN SOIL SUNQUEST PROPERTIES, INC. BRISBANE, CA

Burns & McDonnell Waste Consultants Inc.

SUNVOCSOIL1.DGN/ 4-03-2002 9:53/FB K:\SUNQUEST\USTIN\002.RAP\



K:\UNITED\SFO\USTIN.SUP\WC124X18.DGN( ) OFF=3,61
K:\SUNQUEST\USTIN\USTIN.SUP\SUNQBASE.DGN( ) OFF=1,3-4,13,15-16,22-24,29,33-35,42-43,
SUNQVOCGW1.DGN/ 5-28-2002 14:02/FB K:\SUNQUEST\USTIN\VOU2.RAP\

February 19, 2007

Mr. Vic Pal
Regional Water Quality Control Board
1515 Clay Street, Suite 1400
Oakland, Ca 94612

Subject: OU- 2 Additional Investigation in the area of HVOC plume
San Francisco and Brisbane, California
Burns & McDonnell Project No. 43348

Dear Mr. Pal:

Burns & McDonnell Engineering Company, Inc. (Burns & McDonnell) has been retained by Universal Paragon Corporation (Sunquest) to prepare a letter report summarizing the results of additional investigation at Operable Unit (OU) 2 (Site) which is located on the southern portion of the former Bayshore Railyard located in San Mateo County. This investigation was initiated by Sunquest and is intended to provide useful data for assessment of remediation approach at of the halogenated volatile organic compound (HVOC) plume in OU-2. A workplan was submitted to the Regional Water Quality Control Board (RWQCB) on August 25, 2206. The data obtained in this investigation supplements the previous investigation data summarized in the Investigations Report, Chlorinated Solvents prepared for Sunquest Properties, Inc. in May 2002, and other historical reports.

1.0 Site Description

The Former Bayshore Railyard is located in San Francisco and San Mateo Counties and is bounded by Bayshore Boulevard to the west; the former Schlage Lock Company (Schlage) facility to the north; a CalTrain right-of-way to the east; and hills to the south. The OU-2 portion of the property is comprised of only the southern portion of the former railyard, that is the portion extending southward from Geneva Avenue. Figure 1 shows the boundaries of this portion of the Site.

2.0 Regional and Site Geology

The Site is near the San Francisco Bay, and in the recent geologic past was part of the Bay. The near-surface geology has largely been controlled by the changing morphology of the Bay Area over geologic time.

TABLE 1A
HVOCs Analytical Results in Shallow Soil
OU-2 Additional Investigation

Sample Location		C-34	C-35	C-36	C-37	C-38	C-39
Sample Date		8/30/06	8/30/06	8/30/06	8/30/06	8/30/06	8/30/06
Sample Depth (ft bgs)		3-4'	4.5-5'	6-6.5'	4.5-5'	4.5-5'	3.5-4'
VOCs (µg/kg)	Screening Level						
1,1,1-Trichloroethane	1,200,000	<5	<500	<2,500	<25	<25,000	<250,000
1,1,2-Trichloroethane	730	<5	<500	<2,500	<25	<25,000	<250,000
1,1-Dichloroethane	2,800	<5	<500	<2,500	<25	<25,000	<250,000
1,1-Dichloroethene	120,000	<5	<500	<2,500	<25	<25,000	<250,000
1,2-Dichloroethane	280	<5	<500	<2,500	<25	<25,000	<250,000
Acetone	14,000,000	<100	<10,000	<50,000	<500	<500,000	<5,000,000
Benzene	640	<5	<500	<2,500	<25	<25,000	<250,000
Chloroform	220	7.7	<500	<2,500	<25	<25,000	<250,000
Cis-1,2-Dichloroethene	43,000	<5	3,200	27,000	830	490,000	460,000 J
Ethylbenzene	400,000	<5	<500	<2,500	<25	<25,000	<250,000
Methylene Chloride	9,100	<5	<500	<2,500	<120	<120,000	<1,300,000
Tetrachloroethene	480	15	<500	4,400	<25	310,000	4,200,000 J
Trichloroethene	53	<5	<500	<2,500	<25	40,000	<250,000
Toluene	523,000	<5	<500	<2,500	<25	<25,000	<250,000
Trans-1,2-dichloroethene	69,000	<5	<500	<2,500	160	<25,000	<250,000
Vinyl Chloride	79	<5	2,300	<2,500	84	<25,000	<250,000
Total Xylenes	270,000	<10	<1,000	<5,000	<50	<50,000	<500,000

VOCs = Volatile Organic Compounds
VOCs Analyzed by EPA Method 8260B
Screening Level - Region IX PRG Residential
Exceeds Screening Level
J qualifier - Elevated Surrogate Recovery - indicates potential bias.

TABLE 1B
HVOCs Analytical Results in Deep Soil
OU-2 Additional Investigation

Sample Location		C-34	C-35	C-36	C-37	C-38	C-39
Sample Date		8/30/06	8/30/06	8/30/06	8/30/06	8/30/06	8/30/06
Sample Depth (ft bgs)		7.5-8'	5.5-6'	8-8.5'	6.5-7'	5.5-6'	4.5-5'
VOCs (µg/kg)	Screening Level						
1,1,1-Trichloroethane	1,200,000	<5	<2,500	<2,500	<500	<2,500	<250,000
1,1,2-Trichloroethane	730	<5	<2,500	<2,500	<500	<2,500	<250,000
1,1-Dichloroethane	2,800	<5	<2,500	<2,500	<500	<2,500	<250,000
1,1-Dichloroethene	120,000	<5	<2,500	<2,500	<500	<2,500	<250,000
1,2-Dichloroethane	280	<5	<2,500	<2,500	<500	<2,500	<250,000
Acetone	14,000,000	<100	<50,000	<50,000	<10,000	<50,000	<5,000,000
Benzene	640	<5	<2,500	<2,500	<500	<2,500	<250,000
Chloroform	220	7.7	<2,500	<2,500	<500	<2,500	<250,000
Cis-1,2-Dichloroethene	43,000	<5	<2,500	12,000	630	80,000	960,000
Ethylbenzene	400,000	5.3	<2,500	<2,500	<500	<2,500	<250,000
Methylene Chloride	9,100	<50	<2,500	<2,500	<2,500	<2,500	<1,300,000
Tetrachloroethene	480	<5	<2,500	4,400	20,000	21,000	9,400,000
Trichloroethene	53	<5	<2,500	<2,500	930	<2,500	860,000
Toluene	523,000	<5	<2,500	<2,500	<500	<2,500	<250,000
Trans-1,2-Dichloroethene	69,000	<5	<2,500	2,800	<500	<2,500	<250,000
Vinyl Chloride	79	<5	<2,500	<2,500	<500	3,100	<250,000
Total Xylenes	270,000	31	<5,000	7,100	<1,000	<5,000	<500,000

VOCs = Volatile Organic Compounds
VOCs Analyzed by EPA Method 8260B
Screening Level - Region IX PRG Residential
Exceeds Screening Level

TABLE 2A
HVOCs Analytical Results in Shallow Groundwater
OU-2 Additional Investigation

Sample Location		C-34	C-35	C-36	C-37	C-38	C-39
Sample Date		8/30/06	8/30/06	08/30/06	08/30/06	08/30/06	08/30/06
VOCs (µg/L)	CA MCL						
1,1,1-Trichloroethane	200	<0.5	<0.5	<1,200	<250	<1,000	<500
1,1-Dichloroethane	5	<0.5	<0.5	<1,200	<250	<1,000	<500
1,1-Dichloroethene	6	<0.5	<0.5	<1,200	<250	<1,000	<500
1,2-Dichloroethane	0.5	<0.5	<0.5	<1,200	<250	<1,000	<500
Acetone	5,500	<0.5	<20	<50,000	<10,000	<40,000	<20,000
Carbon Disulfide	1,000	<0.5	<0.5	<1,200	<250	<1,000	<500
Chloroform	80	<0.5	<0.5	<1,200	<250	<1,000	<500
Cis-1,2-Dichloroethene	6	<0.5	30	150,000	23,000	110,000	91,000
Ethylbenzene	300	0.6	31	<1,200	<250	<1,000	<500
Tetrachloroethene	5	<0.5	2.4	79,000	500	7,900	20,000
Trichloroethene	5	<0.5	1.1	15,000	<250	1,300	2,800
Toluene	150	0.62	0.67	<1200	<250	<1,000	<500
Trans-1,2-dichloroethene	10	<0.5	0.67	2,800	<250	<1,000	<500
Vinyl Chloride	0.5	<0.5	4.3	49,000	7,400	14,000	2,500
Total Xylenes	1,750	6.1	13	<1,200	<250	<1,000	<500

VOCs = Volatile Organic Compounds
VOCs Analyzed by EPA Method 5030C/8260B
Screening Level - Region IX PRG Residential
Exceeds Screening Level

TABLE 2B
HVOCs Analytical Results in Deep Groundwater
OU-2 Additional Investigation

Sample Location		C-34	C-35	C-36	C-37	C-38	C-39
Sample Date		8/30/06	8/30/06	8/30/06	8/30/06	8/30/06	8/30/06
VOCs (µg/L)	CA MCL						
1,1,1-Trichloroethane	200	<0.5	<0.5	<2,500	<250	<1,000	<1,000
1,1-Dichloroethane	5	<0.5	<0.5	<2,500	<250	<1,000	<1,000
1,1-Dichloroethene	6	<0.5	<0.5	<2,500	<250	<1,000	<1,000
1,2-Dichloroethane	0.5	<0.5	<0.5	<2,500	<250	<1,000	<1,000
Acetone	5,500	<0.5	<0.5	<100,000	<10,000	<40,000	<40,000
Carbon Disulfide	1,000	<0.5	<0.5	<2,500	<250	<1,000	<1,000
Chloroform	80	<0.5	<0.5	<2,500	<250	<1,000	<1,000
Cis-1,2-Dichloroethene	6	<0.5	25	230,000	23,000	85,000	140,000
Ethylbenzene	300	0.66	3.2	<2,500	<250	<1,000	<1,000
Tetrachloroethene	5	<0.5	1.1	7,600	730	12,000	26,000
Trichloroethene	5	<0.5	0.7	11,000	<250	2,100	5,500
Toluene	150	0.8	4.7	<2,500	<250	<1,000	<1,000
Trans-1,2-dichloroethene	10	<0.5	0.63	4,600	<250	<1,000	<1,000
Vinyl Chloride	0.5	<0.5	4.5	80,000	17,000	11,000	11,000
Total Xylenes	1,750	8.1	16	<2,500	<250	<1,000	<1,000

VOCs = Volatile Organic Compounds
VOCs Analyzed by EPA Method 5030C/8260B
Screening Level - Region IX PRG Residential
Exceeds Screening Level

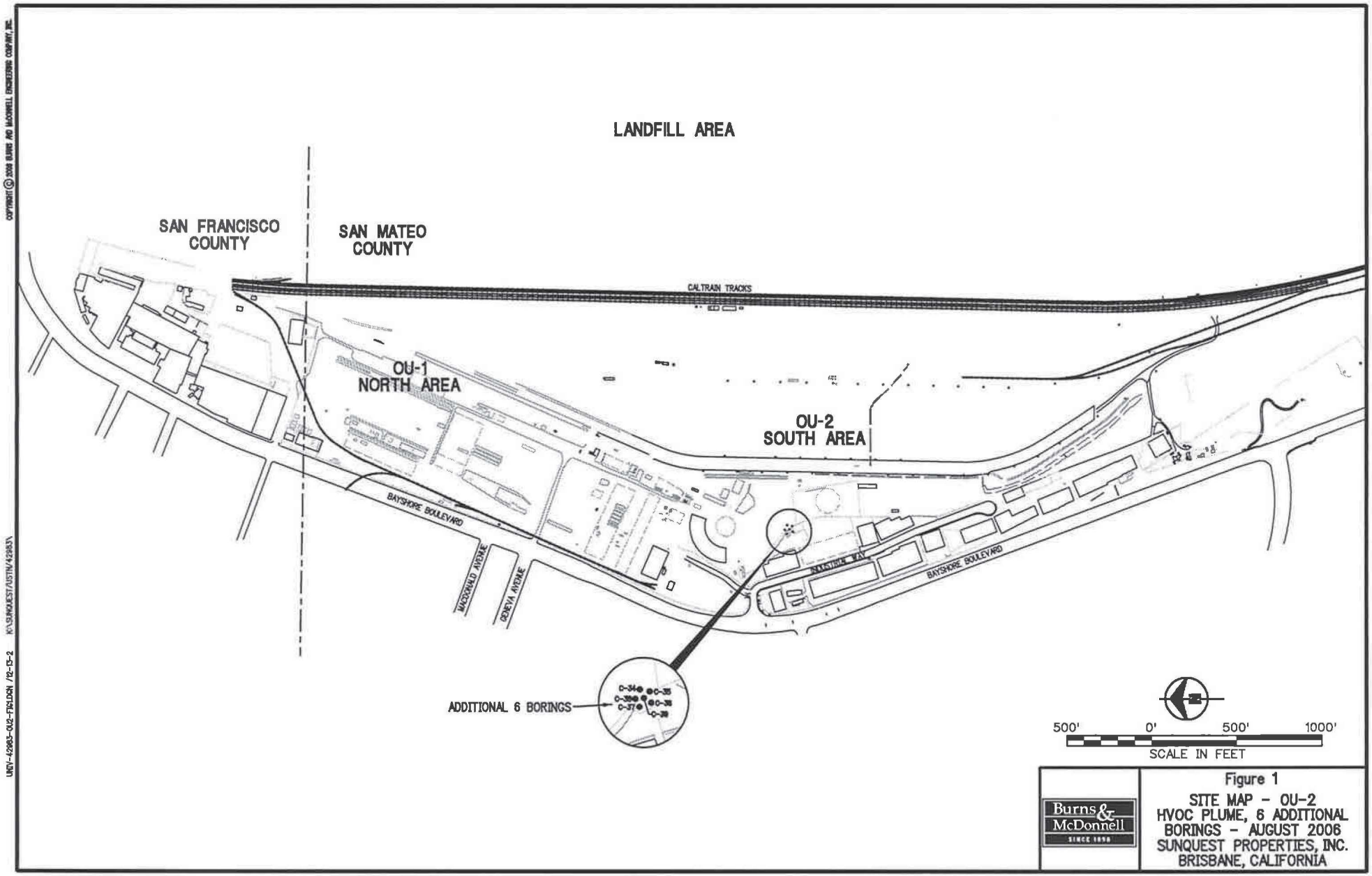


Figure 1
SITE MAP - OU-2
HVOC PLUME, 6 ADDITIONAL BORINGS - AUGUST 2006
SUNQUEST PROPERTIES, INC.
BRISBANE, CALIFORNIA

Burns & McDonnell
SINCE 1898

COPYRIGHT © 2006 BURNS AND MCDONNELL ENGINEERING COMPANY, INC.

UNV-42983-002-F1XLDGN /12-13-2 K:\SUNQUEST\AUSTIN\42983\

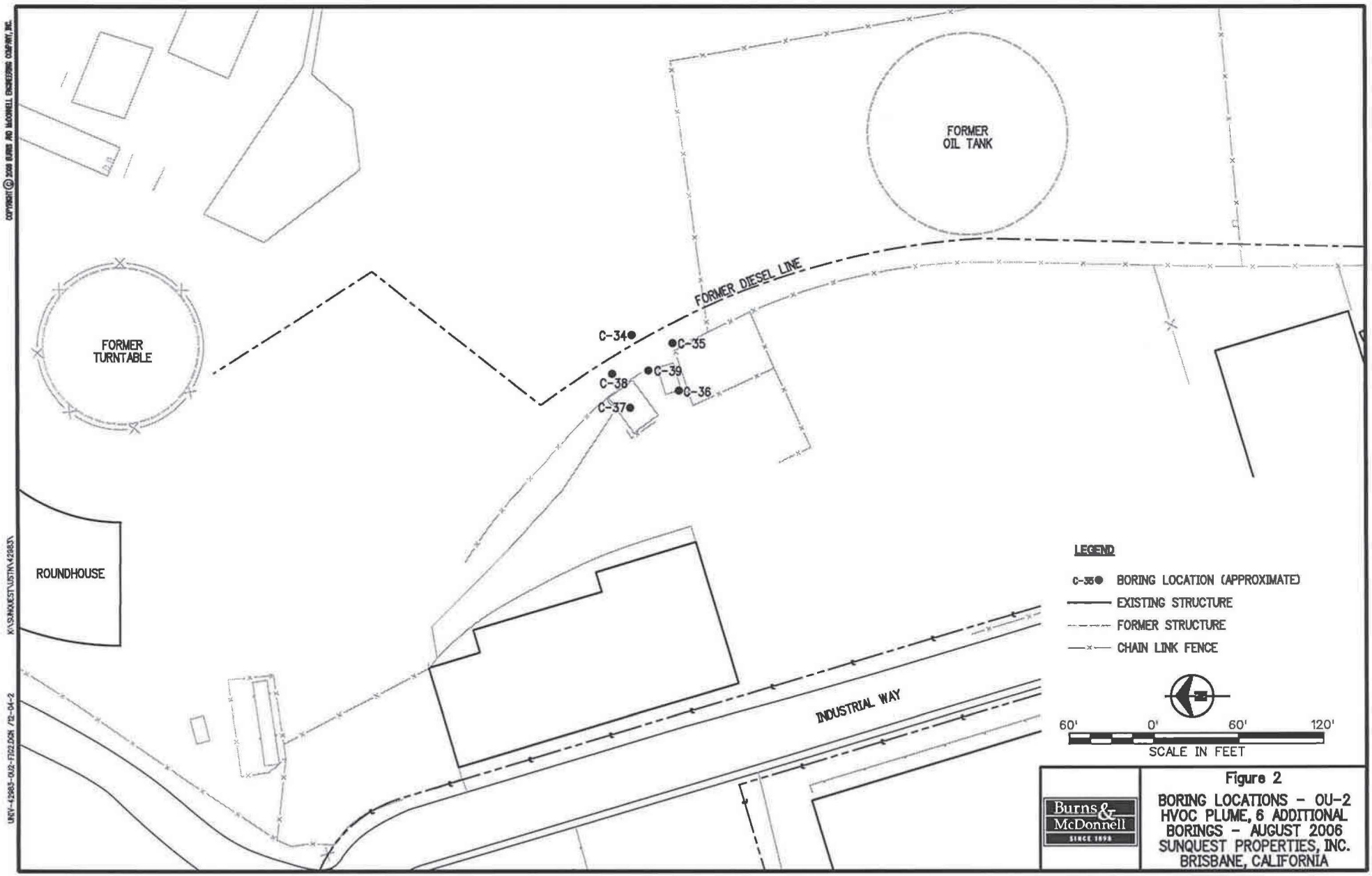


Figure 2

BORING LOCATIONS - OU-2 HVOC PLUME, 6 ADDITIONAL BORINGS - AUGUST 2006
SUNQUEST PROPERTIES, INC.
BRISBANE, CALIFORNIA

COPYRIGHT © 2006 BURNS AND McDONNELL ENGINEERING COMPANY, INC.

FORMER TURNTABLE

FORMER OIL TANK

INDUSTRIAL BLVD.

S-14
SAMPLE DEPTH = 8.5'
BAY MUD DEPTH = 10.0'
ND

S-15
SAMPLE DEPTH = 11.0'
BAY MUD DEPTH = 12.0'
ND

S-17
SAMPLE DEPTH = 7.5'
BAY MUD DEPTH = 8.0'
ND

C-34
SAMPLE DEPTH = 3.0'
Chloroform 7.7
Tetrachloroethene 15
SAMPLE DEPTH = 7.5'
BAY MUD DEPTH = 9.0'
Chloroform 7.7
Ethylbenzene 5.3
Total Xylenes 31

S-16
SAMPLE DEPTH = 6.5'
BAY MUD DEPTH = 7.0'
ND

S-18
SAMPLE DEPTH = 7.5'
BAY MUD DEPTH = 8.0'
ND

C-35
SAMPLE DEPTH = 4.5'
Cis-1,2-Dichloroethene 3,200
Vinyl Chloride 2,300
SAMPLE DEPTH = 5.5'
BAY MUD DEPTH = 6.0'
ND

S-19
SAMPLE DEPTH = 7.5'
BAY MUD DEPTH = 8.0'
Tetrachloroethene 5.8

S-20
SAMPLE DEPTH = 15.5'
BAY MUD DEPTH = 16.0'
ND

C-38
SAMPLE DEPTH = 4.5'
Cis-1,2-Dichloroethene 490,000
Tetrachloroethene 310,000
Trichloroethene 40,000
SAMPLE DEPTH = 5.5'
BAY MUD DEPTH = 6.0'
Cis-1,2-Dichloroethene 80,000
Tetrachloroethene 21,000
Vinyl Chloride 3,100

S-9
SAMPLE DEPTH = 5.0'
BAY MUD DEPTH = 5.5'
cis-1,2-Dichloroethene 240,000
Trichloroethene 100,000
Tetrachloroethene 650,000

S-13
SAMPLE DEPTH = 5.0'
1,2,4-Trimethylbenzene 800
1,3,5-Trimethylbenzene 250
Naphthalene 300
n-Butylbenzene 220
Total Xylenes 130
sec-Butylbenzene 150
para-Isopropyltoluene 180

C-36
SAMPLE DEPTH = 6.0'
Cis-1,2-Dichloroethene 27,000
Tetrachloroethene 4,400
SAMPLE DEPTH = 8.0'
BAY MUD DEPTH = 8.5'
Cis-1,2-Dichloroethene 12,000
Tetrachloroethene 4,400
Trans-1,2-Dichloroethene 2,800
Total Xylenes 7,100

S-11
SAMPLE DEPTH = 1.0'
BAY MUD DEPTH = 4.0'
Tetrachloroethene 4,500,000

S-6
SAMPLE DEPTH = 7.0'
BAY MUD DEPTH = 8.0'
ND

C-39
SAMPLE DEPTH = 3.5'
Cis-1,2-Dichloroethene 480,000
Tetrachloroethene 4,200,000
SAMPLE DEPTH = 5.5'
BAY MUD DEPTH = 6.0'
Cis-1,2-Dichloroethene 960,000
Tetrachloroethene 9,400,000
Trichloroethene 860,000

C-37
SAMPLE DEPTH = 4.5'
Cis-1,2-Dichloroethene 830
Trans-1,2-Dichloroethene 160
Vinyl Chloride 84
SAMPLE DEPTH = 6.5'
BAY MUD DEPTH = 7.0'
Cis-1,2-Dichloroethene 630
Tetrachloroethene 20,000
Trichloroethene 930

R-25
SAMPLE DEPTH = 3.2'
BAY MUD DEPTH = 7.7'
Trichloroethene 170
Tetrachloroethene 2,500,000

S-10
SAMPLE DEPTH = 5.5'
Vinyl Chloride 9.7
Methylene Chloride 21
Cis-1,2-Dichloroethene 5.3

S-7
SAMPLE DEPTH = 6.5'
BAY MUD DEPTH = 7.0'
Methylene Chloride 28

R-23
SAMPLE DEPTH = 1.4'
BAY MUD DEPTH = 9.2'
ND

R-114
SAMPLE DEPTH = 6.5'
BAY MUD DEPTH = 8.5'
1,2,4-Trimethylbenzene 2,100
1,3,5-Trimethylbenzene 840
Ethylbenzene 410
Isopropylbenzene 240
Total Xylenes 1,700
Naphthalene 3,200
para-Isopropyltoluene 490
Propylbenzene 370
sec-Butylbenzene 250
Toluene 250

S-8
SAMPLE DEPTH = 6.0'
BAY MUD DEPTH = 7.0'
Total Xylenes 1,270
Isopropylbenzene 270
Propylbenzene 420
1,3,5-Trimethylbenzene 630
1,2,4-Trimethylbenzene 2,400
sec-Butylbenzene 340
para-Isopropyltoluene 670
n-Butylbenzene 690
Naphthalene 5,000

LEGEND

C-● NEW BORING LOCATION (AUGUST 2006)
R-● PREVIOUS BORING LOCATION (JUNE 2000)
S-● PREVIOUS BORING LOCATION (NOVEMBER 2000)
21 INDICATES HALOGENATED VOCs RESULTS
270 INDICATES NON-HALOGENATED VOCs RESULTS
ND NO HVOCs OR VOCs DETECTED ABOVE REPORTING LIMITS
APPROXIMATE AREA OF HALOGENATED VOCs IMPACT IN SOIL
EXISTING STRUCTURE
FORMER STRUCTURE

NOTES

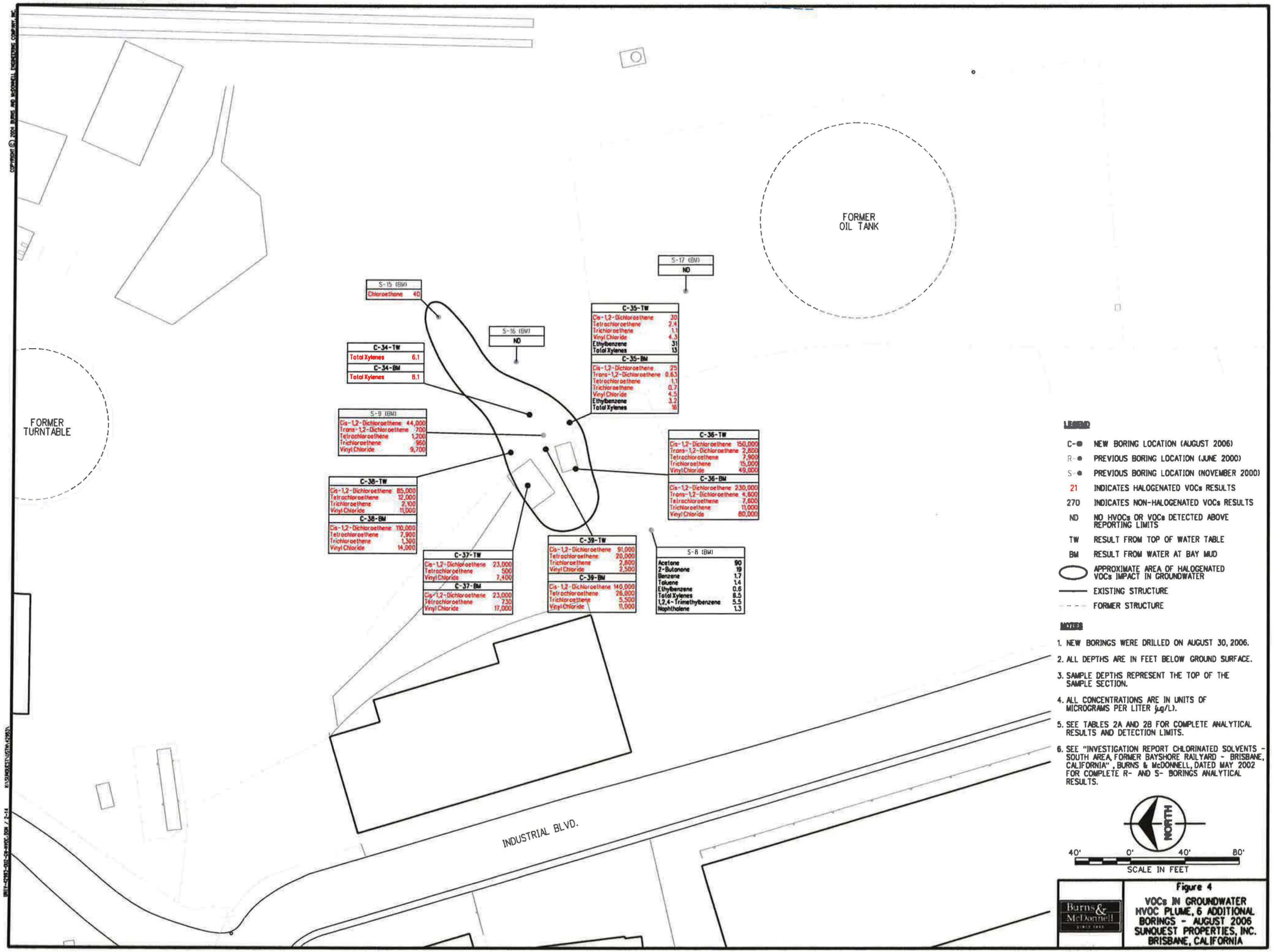
1. NEW BORINGS WERE DRILLED ON AUGUST 30, 2006.
2. ALL DEPTHS ARE IN FEET BELOW GROUND SURFACE.
3. SAMPLE DEPTHS REPRESENT THE TOP OF THE SAMPLE SECTION.
4. ALL CONCENTRATIONS ARE IN UNITS OF MICROGRAMS PER KILOGRAM (µg/Kg).
5. SEE TABLES 1A AND 1B FOR COMPLETE ANALYTICAL RESULTS AND DETECTION LIMITS.
6. SEE "INVESTIGATION REPORT CHLORINATED SOLVENTS - SOUTH AREA, FORMER BAYSHORE RAILYARD - BRISBANE, CALIFORNIA", BURNS & McDONNELL, DATED MAY 2002 FOR COMPLETE R- AND S- BORINGS ANALYTICAL RESULTS.

NORTH

40' 0' 40' 80'
SCALE IN FEET

Burns & McDonnell

Figure 3
VOCs CONCENTRATIONS IN SOIL HVOC PLUME, 6 ADDITIONAL BORINGS - AUGUST 2006 SUNQUEST PROPERTIES, INC. BRISBANE, CALIFORNIA


FORMER
OIL TANK
FORMER
TURNTABLE
INDUSTRIAL BLVD.
S-15 (BM)
Chloroethene 40
S-16 (BM)
ND
S-17 (BM)
ND
C-34-TW
Total Xylenes 6.1
C-34-BM
Total Xylenes 8.1
C-35-TW
Cis-1,2-Dichloroethene 30
Tetrachloroethene 2.4
Trichloroethene 1.1
Vinyl Chloride 4.3
Ethylbenzene 31
Total Xylenes 13
C-35-BM
Cis-1,2-Dichloroethene 25
Trans-1,2-Dichloroethene 0.63
Tetrachloroethene 1.1
Trichloroethene 0.7
Vinyl Chloride 4.5
Ethylbenzene 3.2
Total Xylenes 16
S-9 (BM)
Cis-1,2-Dichloroethene 44,000
Trans-1,2-Dichloroethene 700
Tetrachloroethene 1,200
Trichloroethene 950
Vinyl Chloride 9,700
C-36-TW
Cis-1,2-Dichloroethene 150,000
Trans-1,2-Dichloroethene 2,800
Tetrachloroethene 7,900
Trichloroethene 15,000
Vinyl Chloride 49,000
C-36-BM
Cis-1,2-Dichloroethene 230,000
Trans-1,2-Dichloroethene 4,600
Tetrachloroethene 7,600
Trichloroethene 11,000
Vinyl Chloride 80,000
C-38-TW
Cis-1,2-Dichloroethene 85,000
Tetrachloroethene 12,000
Trichloroethene 2,100
Vinyl Chloride 11,000
C-38-BM
Cis-1,2-Dichloroethene 110,000
Tetrachloroethene 7,900
Trichloroethene 1,300
Vinyl Chloride 14,000
C-37-TW
Cis-1,2-Dichloroethene 23,000
Tetrachloroethene 500
Vinyl Chloride 7,400
C-37-BM
Cis-1,2-Dichloroethene 23,000
Tetrachloroethene 730
Vinyl Chloride 17,000
C-39-TW
Cis-1,2-Dichloroethene 91,000
Tetrachloroethene 20,000
Trichloroethene 2,800
Vinyl Chloride 2,500
C-39-BM
Cis-1,2-Dichloroethene 140,000
Tetrachloroethene 26,000
Trichloroethene 5,500
Vinyl Chloride 11,000
S-8 (BM)
Acetone 90
2-Butanone 19
Benzene 1.7
Toluene 1.4
Ethylbenzene 0.6
Total Xylenes 8.5
1,2,4-Trimethylbenzene 5.5
Naphthalene 1.3
LEGEND
C-● NEW BORING LOCATION (AUGUST 2006)
R-● PREVIOUS BORING LOCATION (JUNE 2000)
S-● PREVIOUS BORING LOCATION (NOVEMBER 2000)
21 INDICATES HALOGENATED VOCs RESULTS
270 INDICATES NON-HALOGENATED VOCs RESULTS
ND NO HVOCs OR VOCs DETECTED ABOVE REPORTING LIMITS
TW RESULT FROM TOP OF WATER TABLE
BM RESULT FROM WATER AT BAY MUD
APPROXIMATE AREA OF HALOGENATED VOCs IMPACT IN GROUNDWATER
EXISTING STRUCTURE
FORMER STRUCTURE
NOTES
1. NEW BORINGS WERE DRILLED ON AUGUST 30, 2006.
2. ALL DEPTHS ARE IN FEET BELOW GROUND SURFACE.
3. SAMPLE DEPTHS REPRESENT THE TOP OF THE SAMPLE SECTION.
4. ALL CONCENTRATIONS ARE IN UNITS OF MICROGRAMS PER LITER (µg/L).
5. SEE TABLES 2A AND 2B FOR COMPLETE ANALYTICAL RESULTS AND DETECTION LIMITS.
6. SEE "INVESTIGATION REPORT CHLORINATED SOLVENTS - SOUTH AREA, FORMER BAYSHORE RAILYARD - BRISBANE, CALIFORNIA", BURNS & McDONNELL, DATED MAY 2002 FOR COMPLETE R- AND S- BORINGS ANALYTICAL RESULTS.
NORTH
40' 0' 40' 80'
SCALE IN FEET
Burns & McDonnell
Figure 4
VOCs IN GROUNDWATER
HVOC PLUME, 6 ADDITIONAL
BORINGS - AUGUST 2006
SUNQUEST PROPERTIES, INC.
BRISBANE, CALIFORNIA

Weiss Associates *Environmental Science, Engineering and Management*

*5801 Christie Avenue, Suite 600, Emeryville, CA 94608-1939 Fax: 510-547-5043 Phone: **510-450-6000***

March 28, 2008

Mr. Jason Lin
Director of Technical Affairs
Sunquest Properties, Inc.
150 Executive Park Blvd., Suite 4200
San Francisco, California 94134-3309

RE: **Site Characterization Report**
Former UST Sites
250 and 350 Industrial Way
Brisbane, California
Weiss Project No. 174-1323-24-1

Dear Mr. Na:

Weiss Associates (Weiss) is pleased to provide Sunquest Properties, Inc. (Sunquest) this report describing soil investigations at the locations of two former underground storage tanks (USTs) at 250 and 350 Industrial Way in Brisbane, California (the Site). For reference, we have provided a brief overview of our understanding of the project background and have then outlined the scope of work and methods. Location diagrams for the site and a table summarizing analytical results are are included in at the end of this report. Boring logs and laboratory analytical reports are provided in Attachments A and B, respectively.

PROJECT BACKGROUND

The Site is located on Industrial Way in Brisbane, California (Attachment A, Figure 1). The former UST pit areas are located in building-front paved parking areas bounded to the east and west by adjacent paved parking areas, to the north by Industrial Way, and to the south by industrial buildings at 250 and 350/362 Industrial Way. The Site is bounded to the north and west by property pertaining to the former Bayshore Railyard.

One of the UST pit areas is located at 250 Industrial Way. The pit area is estimated to be approximately 5.5 ft wide and 15 ft long, and located approximately 40 ft south of an existing 2-inch-diameter monitoring well (K-1) advanced to 27 ft bgs. The well was rehabilitated and sampled in February, 2008 at the request of the California Regional Water Quality Control Board, San Francisco Bay Region (CRWQCB), and a report summarizing the results is pending.

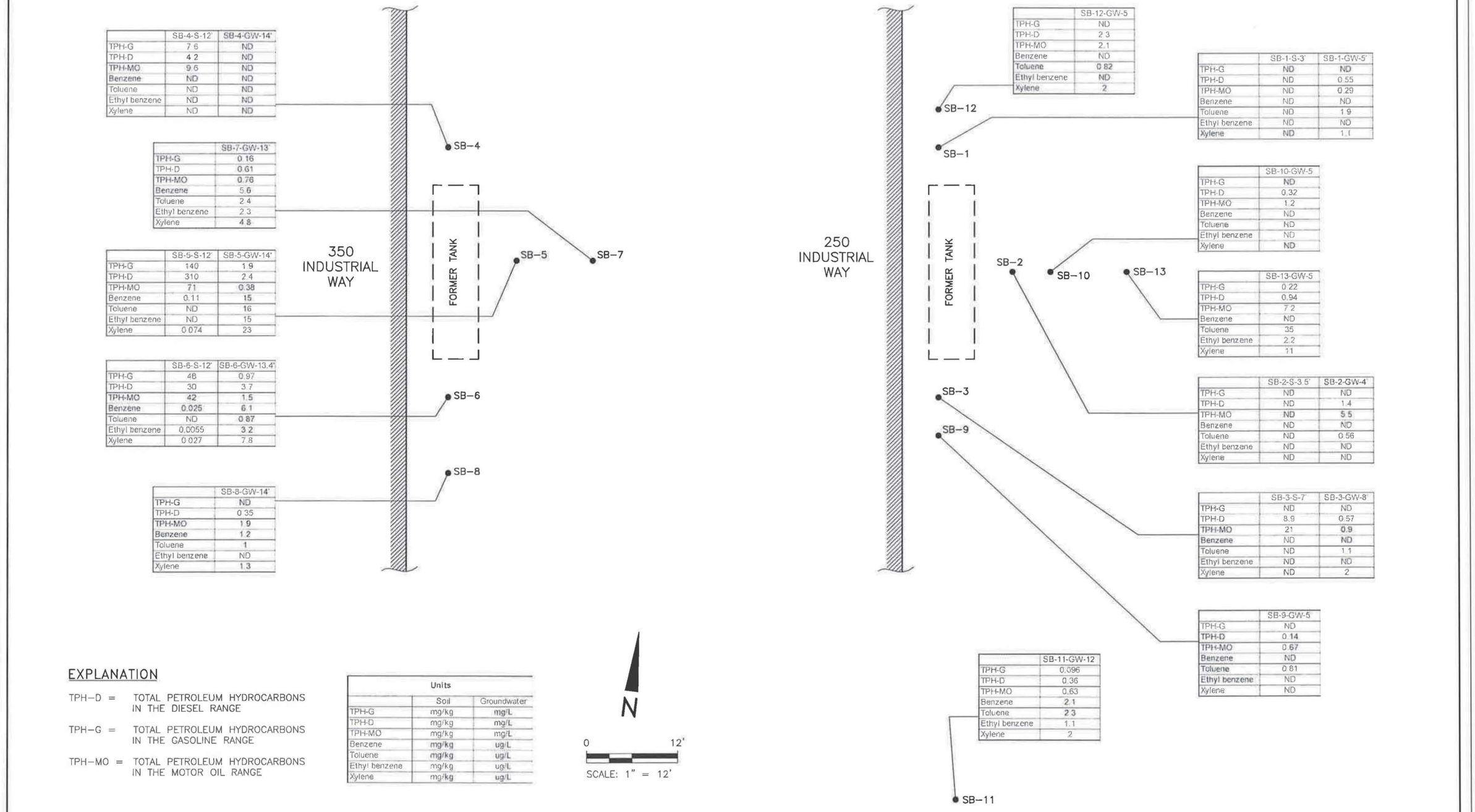
The second UST pit area is located at 350 Industrial Way. The pit area is estimated to be approximately 5.5 ft wide and 30 ft long, and located approximately 10 ft east and 5 ft south of the location of a former monitoring well (MW-1) destroyed in November, 2006, at the request of the County of San Mateo Health Department (CSMHD).

Table 1. Summary of Analytical Results, Former UST Site Characterization, 250 Industrial Way, Brisbane, California

Sample Name	Total Petroleum Hydrocarbons (TPH)			Volatile Organic Compounds (VOCs)																
	TPH-G	TPH-D	TPH-MO	Acetone	Benzene	Ethylbenzene	Toluene	Xylenes	MTBE	Naphthalene	1,2,4-Trimethylbenzene	1,2-Dichloroethane	1,3,5-Trimethylbenzene	2-Butanone	Carbon disulfide	Chlorobenzene	Isopropylbenzene	n-Butyl benzene	n-Propyl benzene	Sec-Butyl benzene	tert-Butyl benzene
	(ppm)			(ppm)																
250 Industrial Way																				
SB-1-S-3'	ND	ND	ND	<0.05	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.0066	<0.004	<0.005	<0.05	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
SB-2-S-3.5'	ND	ND	ND	<0.05	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.004	<0.005	<0.02	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
SB-3-S-7'	ND	8.9, g, b	21	<0.05	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.004	<0.005	<0.02	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	(ppm)			(ppb)																
SB-1-GW-5'	ND, w	0.55, b, g, i	0.29	<10	<0.5	<0.5	1.9	1.1	<0.5	<0.5	1.0	<0.5	<0.5	<2.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
SB-2-GW-4'	ND, w	1.4, g, b, i	5.5	<10	<0.5	<0.5	0.56	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
SB-3-GW-8'	ND, w	0.57, g, b, i	0.9	<20	<0.5	<0.5	1.1	2	<0.5	<0.5	<0.5	<0.5	<0.5	<2.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
SB-9-GW-5'	ND, w	0.14, g, b, i	0.67	<20	<0.5	<0.5	0.81	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	5.7	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
SB-10-GW-5'	ND, w	0.32, g, b, i	1.2	<20	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
SB-12-GW-5'	ND, w	2.3, b, g, i	2.1	<10	<0.5	<0.5	0.82	2	<0.5	<0.5	0.58	<0.5	<0.5	<2.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
SB-13-GW-5'	0.22, (w, x)	0.94, g, b, i	7.2	<20	ND<1.0	2.2	35	11	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<4.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0
350 Industrial Way																				
	(ppm)			(ppm)																
SB-4-S-12'	7.6,	4.2, g, b, d	9.6	0.17	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.004	<0.005	0.073	0.0065	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
SB-5-S-12'	140,y,z	310, n, b, g	71	<10	0.11	ND<0.050	ND<0.050	0.074	ND<0.050	ND<0.050	ND<0.050	ND<0.040	ND<0.050	ND<0.20	ND<0.50	ND<0.050	0.3	0.99	0.98	0.36	ND<0.050
SB-6-S-12'	48, y,z	30, g, n	42	0.20	0.025	0.0055	<0.005	0.027	<0.005	<0.005	0.02	<0.004	0.0090	0.081	0.0062	<0.005	0.031	0.14	0.063	0.072	0.0077
	(ppm)			(ppb)																
SB-4-GW-14'	ND	<0.05	<0.25	<10	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
SB-5-GW-14'	1.9 w,x	2.4 , d, i	0.38	<10	15	15	1.6	23	ND	<0.5	40	0.55	10	3.3	<0.5	0.65	26	14	50	9.1	2.4
SB-6-GW-13.4'	0.97, w,x	3.7,n,g,b,i	1.5	<10	6.1	3.2	0.87	7.8	<0.5	<0.5	8.4	<0.5	3.0	<2.0	<0.5	<0.5	12	3.8	3.3	5.2	0.76
SB-7-GW-13'	0.16, x,z	0.61, g, b, d, i	0.76	<20	5.6	2.3	2.4	4.8	<0.5	<0.5	1.1	<0.5	0.80	<2.0	<0.5	<0.5	2.1	<0.5	2.1	<0.5	<0.5
SB-8-GW-14'	ND, x	0.35, g, b, i	1.9	<20	1.2	<0.5	1.0	1.3	<0.5	<0.5	1.1	0.74	<0.5	<2.0	<0.5	<0.5	2.1	<0.5	2.1	<0.5	<0.5
SB-11-GW-12'	0.096, x,z	0.36, g, b, d, i	0.63	<10	2.1	1.1	2.3	2	<0.5	<0.5	0.69	<0.5	<0.5	<2.0	<0.5	<0.5	1.4	<0.5	0.95	<0.5	<0.5

Notes

a = unmodified or weakly modified diesel is significant
b = diesel range compounds are significant
d = gasoline range compounds are significant
g = oil range compounds are significant
I = liquid sample that contains greater than ~ 1 vol. % sediment
n = stoddard solvent/mineral spirit
w = liquid sample that contains greater than ~ 1 vol. % sediment
x = heavier gasoline range compounds are significant
y = strongly aged gasoline or diesel range compounds are significant
z = unmodified or weakly modified gasoline is significant



	SB-4-S-12'	SB-4-GW-14'
TPH-G	7.6	ND
TPH-D	4.2	ND
TPH-MO	9.6	ND
Benzene	ND	ND
Toluene	ND	ND
Ethyl benzene	ND	ND
Xylene	ND	ND

	SB-7-GW-13'
TPH-G	0.16
TPH-D	0.61
TPH-MO	0.76
Benzene	5.6
Toluene	2.4
Ethyl benzene	2.3
Xylene	4.8

	SB-5-S-12'	SB-5-GW-14'
TPH-G	140	1.9
TPH-D	310	2.4
TPH-MO	71	0.38
Benzene	0.11	15
Toluene	ND	16
Ethyl benzene	ND	15
Xylene	0.074	23

	SB-6-S-12'	SB-6-GW-13.4'
TPH-G	48	0.97
TPH-D	30	3.7
TPH-MO	42	1.5
Benzene	0.025	6.1
Toluene	ND	0.87
Ethyl benzene	0.0055	3.2
Xylene	0.027	7.8

	SB-8-GW-14'
TPH-G	ND
TPH-D	0.35
TPH-MO	1.9
Benzene	1.2
Toluene	1
Ethyl benzene	ND
Xylene	1.3

	SB-12-GW-5
TPH-G	ND
TPH-D	2.3
TPH-MO	2.1
Benzene	ND
Toluene	0.82
Ethyl benzene	ND
Xylene	2

	SB-1-S-3'	SB-1-GW-5'
TPH-G	ND	ND
TPH-D	ND	0.55
TPH-MO	ND	0.29
Benzene	ND	ND
Toluene	ND	1.9
Ethyl benzene	ND	ND
Xylene	ND	1.1

	SB-10-GW-5
TPH-G	ND
TPH-D	0.32
TPH-MO	1.2
Benzene	ND
Toluene	ND
Ethyl benzene	ND
Xylene	ND

	SB-13-GW-5
TPH-G	0.22
TPH-D	0.94
TPH-MO	7.2
Benzene	ND
Toluene	35
Ethyl benzene	2.2
Xylene	11

	SB-2-S-3.5'	SB-2-GW-4
TPH-G	ND	ND
TPH-D	ND	1.4
TPH-MO	ND	5.5
Benzene	ND	ND
Toluene	ND	0.56
Ethyl benzene	ND	ND
Xylene	ND	ND

	SB-3-S-7'	SB-3-GW-8'
TPH-G	ND	ND
TPH-D	8.9	0.57
TPH-MO	21	0.9
Benzene	ND	ND
Toluene	ND	1.1
Ethyl benzene	ND	ND
Xylene	ND	2

	SB-9-GW-5
TPH-G	ND
TPH-D	0.14
TPH-MO	0.67
Benzene	ND
Toluene	0.81
Ethyl benzene	ND
Xylene	ND

	SB-11-GW-12
TPH-G	0.096
TPH-D	0.36
TPH-MO	0.63
Benzene	2.1
Toluene	2.3
Ethyl benzene	1.1
Xylene	2

EXPLANATION

TPH–D = TOTAL PETROLEUM HYDROCARBONS IN THE DIESEL RANGE

TPH–G = TOTAL PETROLEUM HYDROCARBONS IN THE GASOLINE RANGE

TPH–MO = TOTAL PETROLEUM HYDROCARBONS IN THE MOTOR OIL RANGE

Units		
	Soil	Groundwater
TPH-G	mg/kg	mg/L
TPH-D	mg/kg	mg/L
TPH-MO	mg/kg	mg/L
Benzene	mg/kg	ug/L
Toluene	mg/kg	ug/L
Ethyl benzene	mg/kg	ug/L
Xylene	mg/kg	ug/L

Figure 2. Boring Locations and Summary of Analytical Results, Former UST Sites, 250 and 350 Industrial Way, Brisbane, California

Semi-Annual Groundwater Monitoring Report: February 2018 Former Brisbane Railyard: Operable Unit 2 (OU-2)

prepared for

Sunquest Properties
Former Brisbane Railyard: Operable Unit-2
South San Francisco, CA

Project No. 105625

8/3/2018

prepared by

Burns & McDonnell Engineering Company, Inc.
South San Francisco, California

COPYRIGHT © 2018 BURNS & McDONNELL ENGINEERING COMPANY, INC.

Table 5

Concentrations of Total Petroleum Hydrocarbons in Groundwater Surface Water
Southern Area OU-2
Former Bayshore Railyard
Brisbane, California

Sample ID	Location/ Area	Sample Date	TPH (C5-C12) Gasoline Range (mg/L)		TPH (C12- C22) Diesel Range (mg/L)		TPH (C22-C32) (mg/L)		TPH (C32-40) Motor Oil Range (mg/L)		TEH (C12-40) Total Extractable (mg/L)
A-Fill Aquifer Monitoring Well											
KMW-4A	OT	2/13/18	0.0431	J	<0.033		<0.033		<0.033		<0.033
KMW-7A	SD	2/13/18	0.0384	J	0.0341		<0.033		<0.033		0.0341
LF-3A	TT	2/14/18	<0.0304		<0.033		<0.033		<0.033		<0.033
LF-4A	OT	2/14/18	0.0476	J	1.21		0.213		0.0452	J	1.4682
LF-5A	OT	2/14/18	<0.0304		0.041	J	<0.033		<0.033		0.041
LF-7A	SD	2/14/18	0.0312	J	<0.033	J	<0.033		<0.033		<0.033
LF-8A	OT	2/14/18	0.0413	J	2.71		1.15		0.357		4.217
MK-1A	TT	2/14/18	<0.0304		0.089	J	0.183		0.102		0.374
MK-7A	OT	2/14/18	<0.0304		<0.033		<0.033		<0.033		<0.033
MK-8A	SD	2/14/18	<0.0304		<0.033		<0.033		<0.033		<0.033
MW-10A *	SD	2/14/18	<0.0305		<0.033		<0.033		<0.033		<0.033
MW-10ADup	SD	2/14/18	0.0352	J	0.0391	J	0.0349	J	<0.033		0.074
MW-11AR	OT	2/13/18	<0.0304		0.078		0.0808	J	0.0335	J	0.1923
MW-13A	OT	2/14/18	<0.0304		0.0796	J	<0.033		<0.033		0.0796
MW-15A	TT	2/14/18	0.0507	J	11.3		5.36		0.827		17.487
MW-15ADup	TT	2/14/18	0.0609	J	3.51		0.568		0.0895	J	4.1675
MW-17A	TT	2/14/18	0.0346	J	0.199		0.106		0.0566	J	0.3616
Surface Water Drainage Swale											
North Ditch	Surface	---	---		---		---		---		---
Middle Ditch	Surface	---	---		---		---		---		---
South Ditch	Surface	2/14/18	<0.0304		<0.033		0.0331	J	<0.033		0.0331
Outfall	Surface	2/14/18	<0.0304		<0.033		<0.033		<0.033		<0.033

Locations:

OT	Oil Tank Area
SD	South Disposal Area
TT	Turntable Area

Notes:

Bold	Concentrations in bold font are above the MDL
a	The associated batch QC was outside the established quality control range for precision
b	The associated batch QC was outside the established quality control range for accuracy
J/J*	The identification of the analyte is acceptable; the reported value is an estimate
mg/L	Concentrations are in units of milligrams per liter (mg/L)
MW-#Dup	Field duplicate sample, parent well listed directly in front of duplicate designation.
TPH	Total Petroleum Hydrocarbons as Gasoline (TPHg), Diesel (TPHd), and Motor Oil (TPHmo).
	TPHg by USEPA Method 8260B
	TPHd & TPHmo by USEPA 3630/8015B and 3630C/3510C: with silica gel cleanup preparation
mg/L	Concentrations are in units of milligrams per liter (mg/L)
< #.#	Not detected at noted Method Detection Limit (MDL)
--	Surface sample location is dry, no water to sample
*	Well scheduled for replacement in 2018

Table 6

Concentrations of Title 22 Metals in Groundwater
Southern Area OU-2
Former Bayshore Railyard
Brisbane, California

Sample ID	LF-7A	MK-8A	MW-10A***	MW-10ADup	MCLs
Sample Date	2/14/2018	2/14/2018	2/14/2018	2/14/2018	(µg/L)
Units	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(µg/L)
A-Fill Aquifer Monitoring Wells					
Antimony	0.00235	0.0111	0.0072	0.00495	*6*
Arsenic	0.000529 J	0.00118	0.0105	0.0111	*10*
Barium	0.000272	0.0541	0.161	0.162	*1,000*
Beryllium	<0.0007	<0.0007	<0.0007	<0.0007	*4*
Cadmium	0.000169 J	0.00129	0.000546 J	0.000374 J	*5*
Chromium	<0.0014	<0.0014	<.00014	<0.0014	*50*
Cobalt	0.0025 J	<0.0023	0.00641 J	0.00635 J	*3*
Copper	0.0.0781	0.0204 J	0.056	0.0443	*1,000***
Lead	0.000641	0.00351	<0.00024	<0.00024	*15***
Mercury	<0.000049	<0.000049	<0.000049	<0.000049	*2*
Molybdenum	<0.0016	<0.0016	0.00588	0.00509	*5,000**
Nickel	0.00376	0.0249	0.00977	0.00841	*100*
Selenium	<0.00038	0.00277	0.000514 J	0.00042 J	*50*
Silver	<0.00031	<0.00031	<0.00031	<0.00031	*100**
Thallium	<0.00019	<0.00019	<0.00019	<0.00019	*2*
Vanadium	<0.0024	<0.0024	<0.0024	<0.0024	*100**
Zinc	0.0589	0.76	0.0332	0.0192 J	*5,000**

Notes and Qualifiers:

Concentrations are in units of milligrams per liter (mg/L)
Results represent dissolved concentrations
Samples were filtered by the laboratory upon arrival and analyzed using USEPA Method 6010B & 6020
Mercury was analyzed using USEPA 245.1/SW7470A

BOLD	Exceeds MCL
*	Secondary Contaminate Level
**	Action Level
***	Well scheduled for replacement in 2018
---	Well not sampled
AF	A Fill Zone
B	The same analyte is found in the associated balnk
J	The identification of the analyte is acceptable; the reported value is an estimate
< #	Not Detected at noted Method Detction Limit (MDL)

Table 7

Concnetrations of Volatile Organic Compounds in Groundwater
Southern Area OU-2
Former Bayshore Railyard
Brisbane, California

Sample ID	LF-4A	LF-5A	MW-11AR	MW-13A	MW-15A	MW-15ADup	MCLs
Sample Date	02/14/2018	02/14/2018	02/15/2018	02/14/2018	02/14/2018	02/14/2018	
Units	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(µg/L)
A-Fill Aquifer Monitoring Wells							
Vinyl Chloride	<0.000259	<0.000259	<0.000259	<0.000259	<0.000259	<0.000259	*0.5*
1,1-DCE	<0.000398	<0.000398	<0.000398	<0.000398	<0.000398	<0.000398	*6*
cis-1,2-DCE	<0.00026	<0.00026	<0.00026	<0.00026	<0.00026	<0.00026	*6*
trans-1,2-DCE	<0.000396	<0.000396	<0.000396	<0.000396	<0.000396	<0.000396	*10*
PCE	<0.000372	<0.000372	<0.000372	<0.000372	<0.000372	<0.000372	*5*
TCE	<0.000398	<0.000398	<0.000398	<0.000398	<0.000398	<0.000398	*5*
Benzene	---	---	---	---	<0.000331	<0.000331	*1*
Toluene	---	---	---	---	<0.000412	<0.000412	*150*
Ethylbenzene	---	---	---	---	<0.000384	<0.000384	*300*
Total Xylenes	---	---	---	---	<0.00106	<0.00106	*1,750*

*Table 4-3 presents targeted VOC analytes; full EPA 8260B reults can be found in Appendix B.

VOC's and BTEX analyzed using USEPA Method 8260B

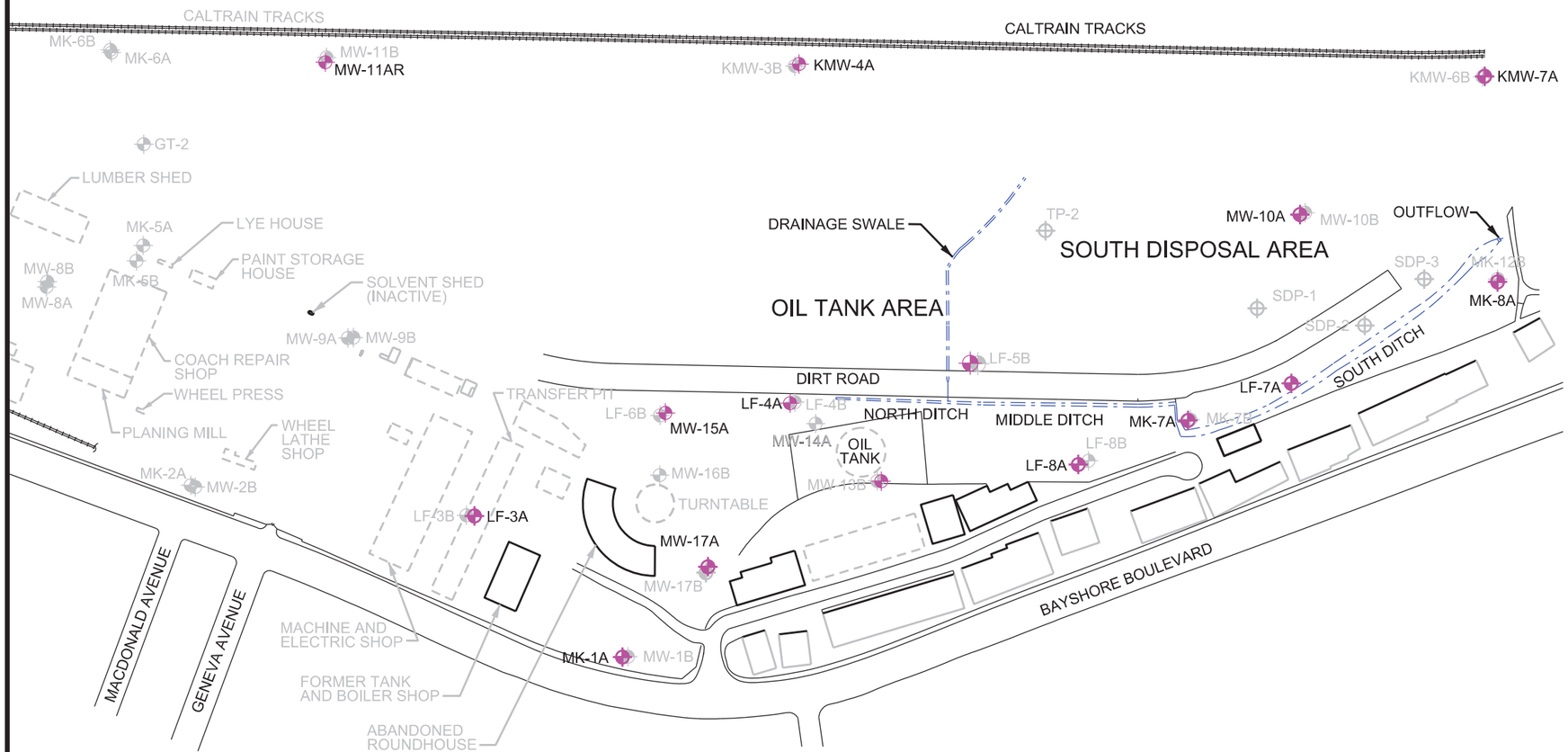
Notes and Qualifiers:

Concentrations are in units of milligrams per liter (mg/L)

J =	Estimated result
<# =	Not detected at noted Method Detction Limit (MDL)
MCLs =	Maximum contaminate level
MW-#Dup	Field duplicate sample, parent well indicated
---	Not analyzed / not available

Chemical Abbreviations:

1,1-DCE	1,1-dichloroethene
cis-1,2-DCE	cis-1,2-dichloroethene
trans-1,2-DCE	trans-1,2-dichloroethene
PCE	Tetrachloroethene
TCE	Trichloroethene
Xylenes	m, p-xylenes and o-xylene



LEGEND

- MONITORING WELL
- PIEZOMETER
- EXISTING STRUCTURE (SURVEYED LOCATION)
- FORMER STRUCTURE (APPROXIMATE LOCATION)
- RAILROAD TRACKS
- DRAINAGE DITCH

N

0 400' 800'

SCALE IN FEET

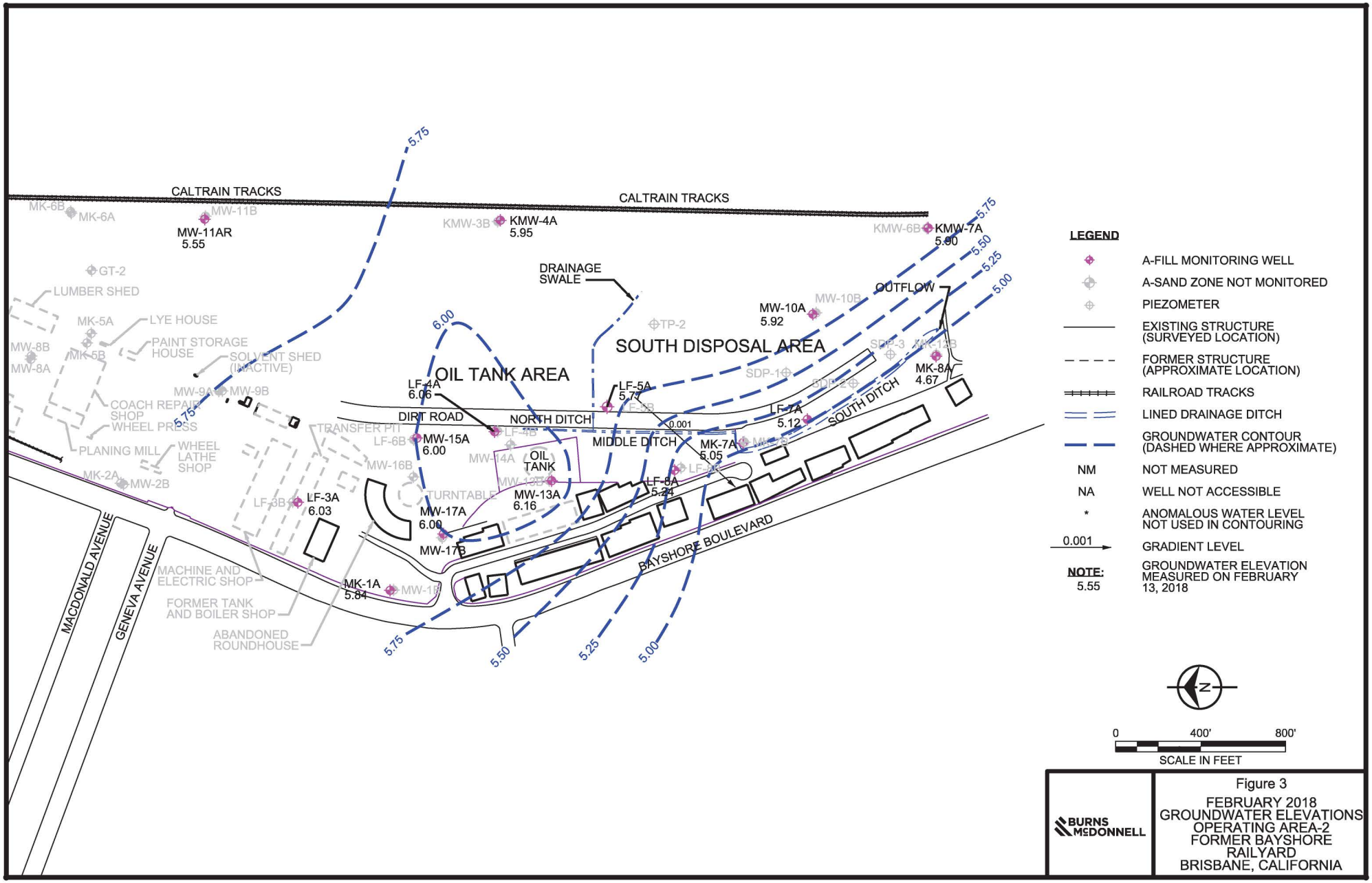
BURNS McDONNELL

Figure 2

SITE PLAN - SOUTH AREA
OPERATING AREA-2
FORMER BAYSHORE
RAILYARD
BRISBANE, CALIFORNIA

COPYRIGHT © 2015 BURNS & McDONNELL ENGINEERING COMPANY, INC.

\\bmcd\dfs\Clients\ENS\SunquestProp\90924_OU2Groundwater\Design\CADD\Dwgs\Feb 2017\sunqf59a_FIG2_Feb2017_SCA_NewLOGO.dgn sos April 3, 2015

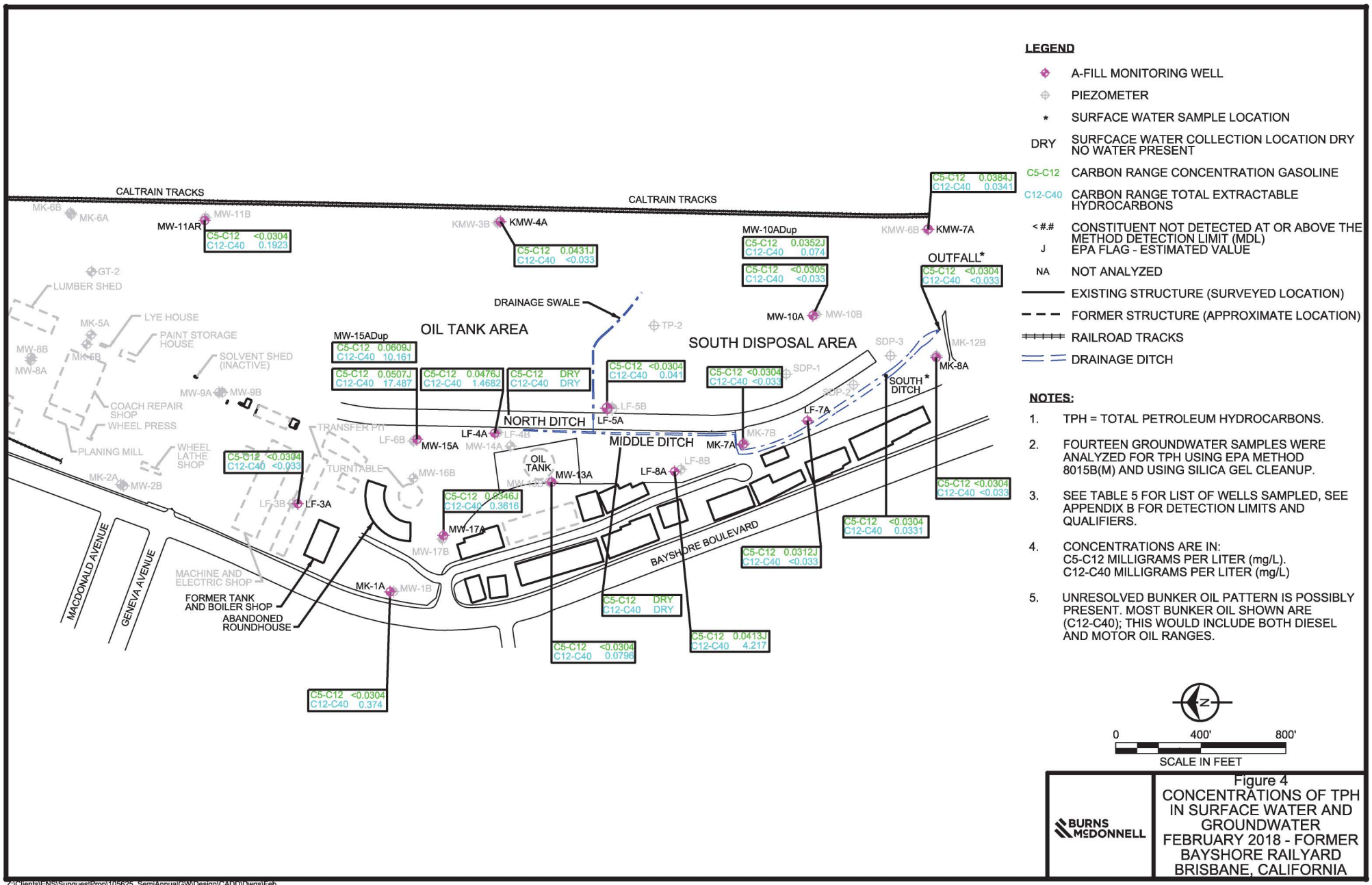


COPYRIGHT © 2015 BURNS & McDONNELL ENGINEERING COMPANY, INC.

Z:\Clients\ENS\SunquestProp\105625_SemiAnnualGW\Design\CADD\Dwgs\Feb 2018\sunqf59a_FIG3_Feb2018_SCA_NewLOGO.dgn

BURNS McDONNELL

Figure 3
FEBRUARY 2018
GROUNDWATER ELEVATIONS
OPERATING AREA-2
FORMER BAYSHORE
RAILYARD
BRISBANE, CALIFORNIA



LEGEND

- A-FILL MONITORING WELL
- PIEZOMETER
- * SURFACE WATER SAMPLE LOCATION
- DRY SURFCACE WATER COLLECTION LOCATION DRY NO WATER PRESENT
- C5-C12 CARBON RANGE CONCENTRATION GASOLINE
- C12-C40 CARBON RANGE TOTAL EXTRACTABLE HYDROCARBONS
- < #.# CONSTITUENT NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)
- J EPA FLAG - ESTIMATED VALUE
- NA NOT ANALYZED
- EXISTING STRUCTURE (SURVEYED LOCATION)
- FORMER STRUCTURE (APPROXIMATE LOCATION)
- RAILROAD TRACKS
- DRAINAGE DITCH

NOTES:

1. TPH = TOTAL PETROLEUM HYDROCARBONS.
2. FOURTEEN GROUNDWATER SAMPLES WERE ANALYZED FOR TPH USING EPA METHOD 8015B(M) AND USING SILICA GEL CLEANUP.
3. SEE TABLE 5 FOR LIST OF WELLS SAMPLED, SEE APPENDIX B FOR DETECTION LIMITS AND QUALIFIERS.
4. CONCENTRATIONS ARE IN:
   C5-C12 MILLIGRAMS PER LITER (mg/L).
   C12-C40 MILLIGRAMS PER LITER (mg/L)
5. UNRESOLVED BUNKER OIL PATTERN IS POSSIBLY PRESENT. MOST BUNKER OIL SHOWN ARE (C12-C40); THIS WOULD INCLUDE BOTH DIESEL AND MOTOR OIL RANGES.

N

0 400' 800'

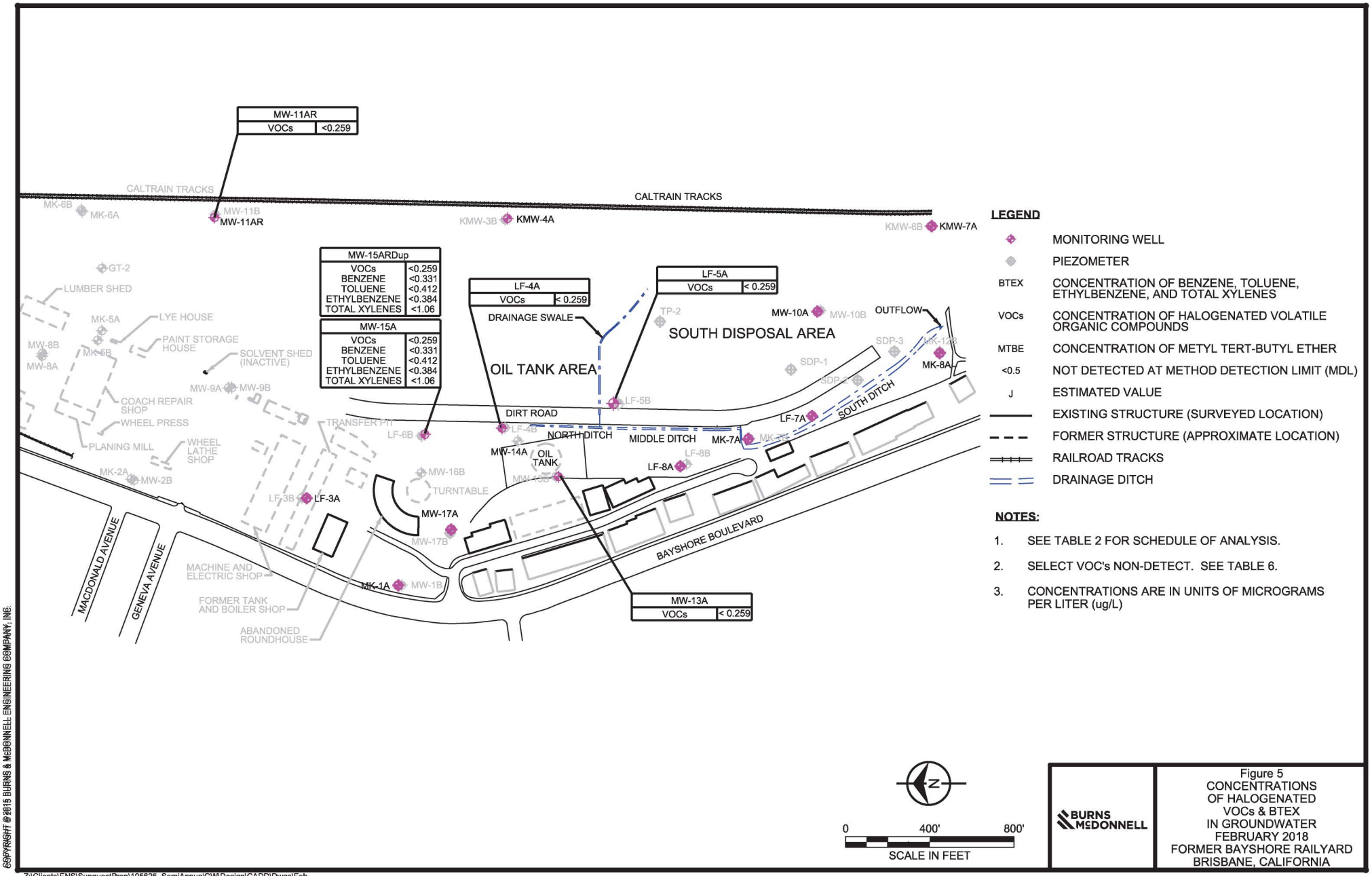
SCALE IN FEET

BURNS McDONNELL

Figure 4
CONCENTRATIONS OF TPH IN SURFACE WATER AND GROUNDWATER FEBRUARY 2018 - FORMER BAYSHORE RAILYARD BRISBANE, CALIFORNIA

COPYRIGHT © 2015 BURNS & McDONNELL ENGINEERING COMPANY, INC.

Z:\Clients\ENS\Sunquest\Prop\105625_SemiAnnualGW\Design\CADD\Dwgs\Feb 2018\sunqf59a_FIG4_Feb2018_SCA_NewLOGO.dgn sos April 3, 2015

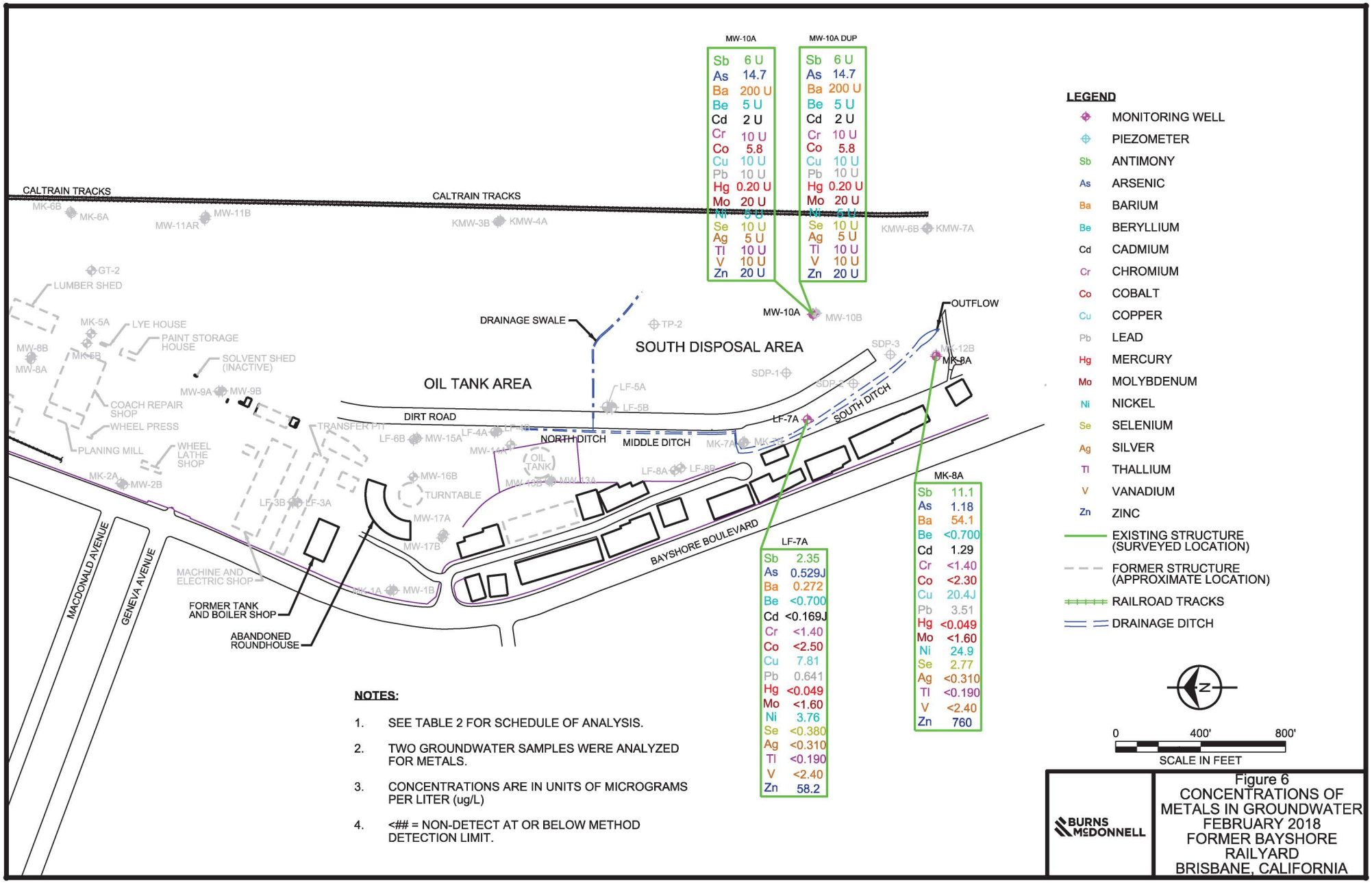


COPYRIGHT © 2015 BURNS & McDONNELL ENGINEERING COMPANY, INC.

BURNS McDONNELL

Figure 5
CONCENTRATIONS OF HALOGENATED VOCs & BTEX IN GROUNDWATER
FEBRUARY 2018
FORMER BAYSHORE RAILYARD
BRISBANE, CALIFORNIA

Z:\Clients\ENS\SunquestProp\105625_SemiAnnualGW\Design\CADD\Dwgs\Feb 2018\sunqf59a_FIG5_Feb2018_SCA_NewLOGO.dgn sos April 3, 2015



NOTES:

1. SEE TABLE 2 FOR SCHEDULE OF ANALYSIS.
2. TWO GROUNDWATER SAMPLES WERE ANALYZED FOR METALS.
3. CONCENTRATIONS ARE IN UNITS OF MICROGRAMS PER LITER (ug/L)
4. <## = NON-DETECT AT OR BELOW METHOD DETECTION LIMIT.

BURNS McDONNELL

Figure 6
CONCENTRATIONS OF METALS IN GROUNDWATER
FEBRUARY 2018
FORMER BAYSHORE RAILYARD
BRISBANE, CALIFORNIA

COPYRIGHT © 2015 BURNS & McDONNELL ENGINEERING COMPANY, INC.

Z:\Clients\ENS\SunquestProp\105625_SemiAnnualGW\Design\CADD\Dwgs\Feb 2018\sunqf59a_FIG6_Feb2018_SCA_NewLOGO.dgn sos April 3, 2015

APPENDIX C
Brisbane Baylands OU-2 Data Gaps Investigation Report ((Under Seperate Cover))

APPENDIX D
Baseline Health Risk Assessment

Geosyntec consultants

engineers | scientists | innovators

HEALTH RISK ASSESSMENT

BRISBANE BAYLANDS OPERABLE UNIT 2
BRISBANE, CALIFORNIA

Prepared for

Universal Paragon Corporation
150 Executive Park Boulevard, Suite 4000
San Francisco, California 94134

Prepared by

Geosyntec Consultants, Inc.
2700 Ygnacio Valley Road, Suite 130
Walnut Creek, California 94598

Project Number: WG2556

August 9, 2019
Revised January 31, 2020
Revised August 21, 2020

Geosyntec consultants

Health Risk Assessment

Brisbane Baylands Operable Unit 2
Brisbane, California

Prepared for

Universal Paragon Corporation
150 Executive Park Boulevard, Suite 4000
San Francisco, California 94134

Prepared by

Geosyntec Consultants, Inc.
2700 Ygnacio Valley Road, Suite 130
Walnut Creek, California 94598

Robert H. Cheung
Senior Toxicologist / Risk Assessor

Project Number: WG2556

August 9, 2019
Revised January 31, 2020
Revised August 21, 2020

Geosyntec consultants

TABLE OF CONTENTS

EXECUTIVE SUMMARY 1

1. INTRODUCTION 1
   1.1 Objective 1
   1.2 Approach 1
   1.3 Document Organization 2

2. BACKGROUND 3
   2.1 Site Description 3
   2.2 Site Geology/Hydrogeology 4
   2.3 Groundwater Use 4

3. DATA EVALUATION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN 6
   3.1 Data Evaluation 6
   3.2 Selection of Chemicals of Potential Concern 8

4. EXPOSURE ASSESSMENT 9
   4.1 Potentially Exposed Populations 9
   4.2 Potential Exposure Pathways 10
   4.3 Exposure Quantification 11
      4.3.1 Soil 12
      4.3.2 Groundwater 13
      4.3.3 Ambient Air in Trench 13
   4.4 Summary of Exposure Assessment 15

5. TOXICITY ASSESSMENT 17

6. RISK CHARACTERIZATION 19
   6.1 Soil Screening Criteria 19
   6.2 Groundwater Screening Criteria 20
   6.3 Risk Characterization 20
   6.4 Risk Characterization Results 21
      6.4.1 Future Worker 22
      6.4.2 Future Resident 23
      6.4.3 Future Construction Worker 23
      6.4.4 Groundwater Impacts to Aquatic Receptors 24

7. UNCERTAINTIES 26

8. SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS 27
8.1 HRA Summary 27
8.2 Conclusions and Recommendations 29

9. REFERENCES 31

LIST OF TABLES

Table 1: Statistical Summary of Chemicals in Soil

Table 2: Statistical Summary of Chemicals in Groundwater

Table 3a: Exposure Point Concentrations in Soil 0 – 2 feet bgs

Table 3b: Exposure Point Concentrations in Soil 0 – 10 feet bgs

Table 3c: Exposure Point Concentrations in Soil – HVOC Plume

Table 4a: Exposure Point Concentrations in Groundwater

Table 4b: Exposure Point Concentrations in Groundwater – HVOC Plume

Table 5: Toxicity Criteria of COPCs

Table 6: Summary of Excess Lifetime Cancer Risk and Noncancer Hazard Chemicals in Soil All Areas Except Zone 4 – Future Worker

Table 7: Summary of Excess Lifetime Cancer Risk and Noncancer Hazard Chemicals in Soil Zone 4 – Future Worker

Table 8: Summary of Excess Lifetime Cancer Risk and Noncancer Hazard Chemicals in Soil Area of HVOC Plume – Future Worker

Table 9: Summary of Excess Lifetime Cancer Risk and Noncancer Hazard Chemicals in Soil All Areas Except Zone 4 – Future Resident

Table 10: Summary of Excess Lifetime Cancer Risk and Noncancer Hazard Chemicals in Soil Zone 4 – Future Resident

Table 11: Summary of Excess Lifetime Cancer Risk and Noncancer Hazard Chemicals in Soil Area of HVOC Plume – Future Resident

Table 12: Summary of Excess Lifetime Cancer Risk and Noncancer Hazard Chemicals in Soil All Areas Except Zone 4 – Future Construction Worker

Table 13: Summary of Excess Lifetime Cancer Risk and Noncancer Hazard Chemicals in Soil Zone 4 – Future Construction Worker

Table 14: Summary of Excess Lifetime Cancer Risk and Noncancer Hazard Chemicals in Soil Area of HVOC Plume – Future Construction Worker

Table 15: Summary of Excess Lifetime Cancer Risk and Noncancer Hazard Inhalation of Chemicals in Air from Soil All Areas Except for Zone 4 – Off-Site Worker

Table 16: Summary of Excess Lifetime Cancer Risk and Noncancer Hazard Inhalation of Chemicals in Air from Soil Zone 4 – Off-Site Worker

Table 17: Summary of Excess Lifetime Cancer Risk and Noncancer Hazard Inhalation of Chemicals in Air from Soil All Areas Except for Zone 4 – Off-Site Resident

Table 18: Summary of Excess Lifetime Cancer Risk and Noncancer Hazard Inhalation of Chemicals in Air from Zone 4 – Off-Site Resident

Table 19a: Comparison of Exposure Point Concentrations to Groundwater Vapor Intrusion Screening Levels

Table 19b: Comparison of Exposure Point Concentrations in Area of HVOC Plume to Groundwater Vapor Intrusion Screening Levels

Table 20a: Summary of Trench Air Concentrations and Excess Lifetime Cancer Risk and Noncancer Hazard from Soil Vapor into a Trench Sitewide – Hypothetical Future Construction Worker

Table 20b: Summary of Trench Air Concentrations and Excess Lifetime Cancer Risk and Noncancer Hazard from Soil Vapor into a Trench - HVOC Plume Are – Hypothetical Future Construction Worker

Table 21a: Comparison of Exposure Point Concentrations to Groundwater Screening Levels for the Protection of Aquatic Receptors

Table 21b: Comparison of Exposure Point Concentrations in Area of HVOC Plume to Groundwater Screening Levels for the Protection of Aquatic Receptors

LIST OF FIGURES

Figure 1: Site Location Map
Figure 2: Soil Sample Locations
Figure 3: Groundwater Sampling Locations
Figure 4: Conceptual Site Model

LIST OF APPENDICES

Appendix A-1: Analytical Summary of Soil and Groundwater Data in Area of HVOC Plume
Appendix A-2: Analytical Summary of Soil and Groundwater Data
Appendix B: ProUCL Output Files
Appendix C: Trench Model
Appendix D: Particulate Action Levels

ACRONYMS AND ABBREVIATIONS

µg/dL	micrograms per deciliter
95% UCL	95 percent upper confidence limit
A-Fill	A-Fill Water-Bearing Zone
B&M	Burns & McDonnell Engineering Company, Inc.
BaP TEQ	benzo(a)pyrene toxicity equivalents
Basin Plan	San Francisco Bay Basin (Region 2) Water Quality Control Plan
bgs	below ground surface
Brisbane OU-2	Brisbane Operable Unit 2
BTEX	benzene, toluene, ethylbenzene, and xylene
Cal-EPA	California Environmental Protection Agency
CAM	California Assessment Manual
CFR	Code of Federal Regulations
COPCs	chemicals of potential concern
CSM	conceptual site model
CTR	California Toxics Rule
DTSC	Department of Toxic Substances Control
EPA	United States Environmental Protection Agency
EPC	exposure point concentration
ESLs	environmental screening levels
FS/RAP	Feasibility Study/Remedial Action Plan
Geosyntec	Geosyntec Consultants, Inc.
HI	hazard index
HQ	hazard quotient
HRA	health risk assessment
HVOC	halogenated volatile organic compound
IRIS	Integrated Risk Information System
IUR	Inhalation Unit Risk factors
mg/kg	milligrams per kilogram
NCP	National Contingency Plan
ND	non-detect

OCPs	organochlorine pesticides
OEHHA	Office of Environmental Health Hazard Assessment
OU-2	Operable Unit 2
PAHs	polynuclear aromatic hydrocarbons
PCBs	polychlorinated biphenyls
PCE	tetrachloroethene
PEFs	potency equivalency factors
QA/QC	quality assurance/quality control
RAGS	Risk Assessment Guidance for Superfund
RfC	reference concentration
RfD	reference dose
RME	Reasonable Maximum Exposure
RSL	Regional Screening Level
SF	slope factors
SFRWQCB	San Francisco Regional Water Quality Control Board
SLs	screening levels
SPTC	Southern Pacific Transportation Company
SVOCs	semi-volatile organic compounds
TCE	trichloroethene
TDS	total dissolved solids
the Site	UPC OU-2 located in Brisbane, California
TPH	total petroleum hydrocarbons
TPHd	total petroleum hydrocarbons as diesel
TPHg	total petroleum hydrocarbons as gasoline
TPHmo	total petroleum hydrocarbons as motor oil
UPC	Universal Paragon Corporation, Inc.
UST	underground storage tank
VOC	volatile organic compound
YBM	Young Bay Mud

EXECUTIVE SUMMARY

Geosyntec Consultants, Inc. (Geosyntec) has prepared this Health Risk Assessment (HRA) to review potential exposures to chemicals detected in soil and groundwater at the Brisbane Baylands Operable Unit 2 (OU-2) (the Site), located in the southern portion of the former Southern Pacific Transportation Company (SPTC) Brisbane Railyard. The objective of the HRA is to provide an analysis of potential adverse health effects from exposure to chemicals detected in soil and groundwater considering future redevelopment of the Site into mixed high-density residential, commercial/industrial, retail, and recreational uses. This document calculates estimated risks assuming no remedial actions or mitigation measures are implemented and considers potential exposures to Site-related chemicals following development. The intent is to provide risk managers a basis for evaluating whether action to mitigate potential health risks is warranted to support redevelopment of the Site. The results of the assessment will be used to support the Draft Feasibility Study/Remedial Action Plan (FS/RAP) by identifying the media and chemicals detected at the Site that may require further evaluation, risk management, and/or remediation measures to limit potential exposures following development.

Numerous investigations to assess the nature and extent of contaminants have been conducted on the Site, with regulatory oversight, beginning in 1982. The results of previous investigations at the Site indicated that chemicals present in soil and groundwater are metals, volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), polynuclear aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), organochlorine pesticides (OCPs), and petroleum hydrocarbons, including diesel-range hydrocarbons (TPHd) and motor oil-range hydrocarbons (TPHmo), which together represent the Bunker C fuel formerly used at the Site as part of railroad operations.

The analytical data serving as the basis for the HRA were primarily based on the results of the data gap investigation performed at the Site in December 2018 and January 2019, as well as historical soil data for metals collected in 1990 and 1997. In addition, a limited amount of soil and groundwater data from samples collected in August 2006 in an area identified as the halogenated volatile organic compound (HVOC) groundwater plume were evaluated in the HRA.

For the data gap investigation, the Site was subdivided into six investigation sub-areas or zones consisting of the following:

- Zone 1 – Former Switching Yard, North;
- Zone 2 – Former Switching Yard, South;
- Zone 3 – Former Machine and Electric Shop Area;
- Zone 4 – Former Turntable/Oil Tank Area;
- Zone 5 – South Disposal Area; and
- Zone 6 – Industrial Way.

Based on the results of the data gap investigation, analytical data collected from locations within Zone 4 were separately evaluated from the remainder of the Site consisting of Zones 1 through 3

and Zones 5 and 6 because elevated concentrations of petroleum hydrocarbons, primarily Bunker C oil, were reported in soil samples from within Zone 4, the former Oil Tank Area, and the former Turntable Area. Further, the concentrations of HVOCs in soil and groundwater samples collected from within the area previously identified as the area of the HVOC plume are significantly higher compared to other areas of the Site. Therefore, the data collected from within the area of the HVOC plume also was evaluated as a separate exposure unit.

The HRA evaluated both potential cancer risks and noncancer hazard indices for a future worker and a future resident in a manner consistent with current California Environmental Protection Agency (Cal-EPA) and the United States Environmental Protection Agency (EPA) guidance. The assessment evaluated potential noncarcinogenic hazard based on the comparison of the calculated noncarcinogenic hazard index (HI) to Cal-EPA and EPA's point of departure level of an HI of 1. That is, if the calculated HI for a receptor to chemicals detected in soil are less than 1, no further evaluation is necessary, and it can be concluded that no unacceptable risks are present. The EPA explained the use of an HI as follows: "*Aggregate exposures equal to or below a hazard index (HI) of 1.0 derived using target organ specific hazard quotients likely will not result in adverse noncancer health effects over a lifetime of exposure and would ordinarily be considered acceptable. However, an HI greater than 1.0 does not necessarily suggest a likelihood of adverse effects nor does it imply an unacceptable level of effect*" (EPA, 2011).

For evaluating potential cancer risk associated with exposure to chemicals, a lifetime incremental increase in cancer risk in the range of 1×10^{-6} to 1×10^{-4} is generally considered to be acceptable (EPA, 1990). These values correspond to one additional cancer case in 10,000 people (1×10^{-4}) and one additional case in one-million people (1×10^{-6}) above the baseline lifetime cancer risk. The 1×10^{-6} risk level is considered a *de minimis* risk and is generally used as a point of departure for making risk management decisions at a site. With a risk of 1×10^{-4} or greater, an evaluation of remedial measures is required. The risk range between 1×10^{-6} to 1×10^{-4} is commonly called the "discretionary risk range" to assess whether a response action is warranted depending upon site-specific conditions. This risk range is in addition to the background risk of Americans in the general population developing cancer from causes unrelated to a Site-specific exposure. The background risk is one chance in three (0.3 or 3×10^{-1}) for an American female, and one chance in two (0.5 or 5×10^{-1}) for an American male of eventually developing cancer (American Cancer Society, 2017).

As a risk management policy, the Cal-EPA generally considers 1×10^{-6} to be a point of departure for purposes of making risk management decisions. For a future worker, the point of departure is an HI of 1 and excess cancer risk of 1×10^{-5} (the "mid-point" of the risk management range and commonly used for managing commercial/industrial land uses). For a future resident, an HI of 1 and excess cancer risk of 1×10^{-6} were used as acceptable target levels (the 1×10^{-6} risk level is considered the accepted point of departure for unrestricted land use). These target thresholds are consistent with the federal and state criteria described above.

Because arsenic, identified as a chemical of potential concern (COPC), is naturally-occurring and typically is present at concentrations greater than risk-based screening levels, it is appropriate to also evaluate the significance of arsenic by estimating the incremental risk and hazard from potential exposures to arsenic over naturally-occurring background. The incremental excess lifetime cancer risk and noncancer hazard is the difference between exposure to arsenic in soil and

arsenic as background. For this Site, a background concentration of 19 milligrams per kilogram (mg/kg) has been established for arsenic. Similarly, there are many natural sources of PAHs in the environment as PAHs are found in virtually all surface soils in both urban and rural areas. As such, the incremental risk and hazard to PAHs, particularly carcinogenic PAHs, identified as COPCs, also are presented. For this Site, a natural-occurring background concentration of 0.9 mg/kg for carcinogenic PAHs, referenced as benzo(a)pyrene equivalents (BaP TEQ),[1] is used.

Given the distribution of chemicals detected in soil, separate exposure areas were evaluated and include: i) all areas of the Site excluding Zone 4; ii) Zone 4; and iii) Area of the HVOC Plume. The results of the HRA assuming no remediation or remediation efforts indicate that:

- For a future worker, in the absence of any remediation or mitigation efforts, the cumulative HI and cumulative excess lifetime cancer risk from COPCs in soil from 0 to 2 feet bgs are 17 and 2×10^{-4}, respectively. Arsenic and lead are the risk-driving COPCs. The HQs and cancer risks for all other COPCs are less than 1 and 1×10^{-6}, respectively. For arsenic, the estimated noncancer HQ and excess lifetime cancer risk are 16 and 2×10^{-4}, respectively. However, the estimated background noncancer HQ and excess lifetime cancer risk to arsenic are 5.3 and 6×10^{-5}, respectively. Based on these estimates, the incremental noncancer hazard and excess lifetime cancer risk is the difference between baseline and background. The incremental noncancer hazard and excess lifetime cancer risk to arsenic in soil are 11 and 1×10^{-4}, respectively. The results of the assessment indicate that the incremental increase in risk over background is approximately two times higher than baseline.

  Within Zone 4, the cumulative HI and cumulative excess lifetime cancer risk from COPCs in soil from 0 to 2 feet bgs are 7.3 and 4×10^{-5}, respectively. Lead and TPHd are the risk-driving COPCs. The estimated 95% UCL for arsenic is 12.6 mg/kg and below naturally-occurring background. Without arsenic as a COPC in soil, the cumulative HI and cancer risk are 3.7 and 3×10^{-6}, respectively.

  Within the area of the HVOC plume, the cumulative HI and cumulative excess lifetime cancer risk from COPCs in soil from 0 to 10 feet bgs are 64 and 2×10^{-3}, respectively. PCE is the primary risk-driving COPC. Other COPCs contributing to the cumulative risk and HI are cis-1,2-dichloroethene TCE, and vinyl chloride.

  For volatile COPCs in groundwater potentially migrating from top of the water table into indoor air of future structures, vinyl chloride is the primary risk-driving COPC. Within the HVOC plume, cis-1,2-dichloroethene, ethylbenzene, PCE, trans-1,2-dichloroethene, TCE, and vinyl chloride exceed commercial/industrial screening levels.

[1] Seven of the PAHs (benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, and indeno(1,2,3-cd)pyrene) are classified as carcinogens. The Office of Environmental Health Hazard Assessment (OEHHA) of Cal-EPA has developed potency equivalency factors (PEFs) based on their potential carcinogenicity relative to benzo(a)pyrene. Concentrations of the carcinogenic, "benzo(a)pyrene-like" PAHs in soil were converted to BaP TEQ by multiplying the concentration of each PAH by the appropriate PEF developed by OEHHA and then summing the resulting toxicity-weighted concentrations.

- For a future resident, in the absence of any remediation or mitigation efforts, the baseline cumulative HI and cumulative excess lifetime cancer risk from COPCs in soil from 0 to 2 feet bgs are 230 and 9×10^{-4}, respectively. Arsenic, lead, and TPHd are the risk-driving COPCs. For arsenic, the estimated noncancer HQ and excess lifetime cancer risk are 220 and 9×10^{-4}, respectively. The estimated background noncancer HQ and excess lifetime cancer risk to arsenic are 73 and 3×10^{-4}, respectively. The incremental noncancer hazard and excess lifetime cancer risk to arsenic in soil are 150 and 6×10^{-4}, respectively. The incremental increase in risk for arsenic over background is approximately two times higher than baseline. Similarly, while the estimated cancer risk to BaP TEQ is 6×10^{-6}, the 95% UCL of 0.61 mg/kg is lower than the background concentration of 0.9 mg/kg.

  Within Zone 4, the cumulative HI and cumulative excess lifetime cancer risk from COPCs in soil from 0 to 2 feet bgs are 69 and 2×10^{-4}, respectively. Lead and TPHd are the risk-driving COPCs. The estimated 95% UCL for arsenic is 12.6 mg/kg and below naturally-occurring background. Without arsenic as a COPC, the cumulative excess lifetime cancer risk from COPCs in soil are 20 and 3×10^{-5}, respectively. The HQs and cancer risks for all other COPCs are less than 1 and 1×10^{-6}, respectively.

  Within the area of the HVOC plume, the cumulative HI and cumulative excess lifetime cancer risk from COPCs in soil from 0 to 10 feet bgs are 290 and 9×10^{-3}, respectively. PCE is the primary risk-driving COPC. Other COPCs contributing to the cumulative risk and HI are cis-1,2-dichloroethene, TCE, and vinyl chloride.

  For volatile COPCs in groundwater potentially migrating from top of the water table into indoor air of future structures, benzene and vinyl chloride exceed residential screening levels. Within the HVOC plume, cis-1,2-dichloroethene, ethylbenzene, PCE, trans-1,2-dichloroethene, TCE, and vinyl chloride exceed residential screening levels.

- For a future construction worker, without any site remediation or mitigation, the cumulative HI and cumulative excess lifetime cancer risk from COPCs in soil from 0 to 10 feet bgs are 58 and 3×10^{-5}, respectively. Arsenic and lead are the primary risk-driving COPCs. For arsenic, the estimated noncancer HQ and excess lifetime cancer risk are 54 and 3×10^{-5}, respectively. The estimated background noncancer hazard quotient and excess lifetime cancer risk to arsenic are 19 and 9×10^{-6}, respectively. The HQs and cancer risks for all other COPCs are less than 1 and 1×10^{-6}, respectively.

  Within Zone 4, the cumulative HI and cumulative excess lifetime cancer risk from COPCs in soil from 0 to 10 feet bgs are 79 and 3×10^{-5}, respectively. Arsenic, lead and TPHd are the risk-driving COPCs. The HQs and cancer risks for all other COPCs are 1 and 1×10^{-6} or less, respectively.

  Within the area of the HVOC plume, the cumulative HI and cumulative excess lifetime cancer risk from COPCs in soil from 0 to 10 feet bgs based on the maximum concentrations are 88 and 3×10^{-4}, respectively. PCE is the primary risk-driving COPC. Other COPCs contributing to the cumulative risk and HI are cis-1,2-dichloroethene and TCE.

For volatile COPCs potentially migrating from groundwater into trench air, without any site remediation or mitigation, the cumulative HI and cumulative excess lifetime cancer risk are 0.3 and 4×10^{-8}, respectively. Within the area of the HVOC plume, the cumulative HI and cumulative excess lifetime cancer risk are 69 and 2×10^{-4}, respectively; cis-1,2-Dichlrooethene, PCE, TCE, and vinyl chloride are the risk-driving COPCs.

- For an off-Site worker and resident, the cumulative HI and cumulative excess lifetime cancer risk from COPCs in air as fugitive dusts in soil from 0 to 2 feet bgs are less than 1 and 1×10^{-6}, respectively. In addition, action levels were estimated assuming short-term exposures to airborne particles 10 microns or smaller in diameter (PM10) or COPC adhered dust that may be present in air along the perimeter of the Site. The results of the analysis indicate that the project respirable action of level for PM10 can be used to limit concentrations of non-volatile risk-based COPCs as well as PM10. Maintaining respirable particulates below the PM10 action level will ensure that both PM10 emissions and risk-based COPC dust particulates will not reasonably result in unacceptable exposures.
- Groundwater concentrations were compared to surface water screening levels for a marine habitat. Potential exposures to aquatic receptors from COPCs in groundwater are not expected to pose a significant risk to aquatic organisms because the shoreline of the San Francisco Bay is located approximately 0.5 miles east of the Site and attenuation (e.g., adsorption) and dilution are expected to occur. Surface water screening levels for a marine habitat used in the analysis do not consider dilution and/or attenuation of groundwater upon discharge to surface water. The detected concentrations of dissolved constituents in groundwater at the Site prior to entering the San Francisco Bay would likely be reduced 100-fold or greater due to factors such as adsorption of dissolved constituents to soil and dilution effects from tidal influence. Based on an attenuation factor of 100 that has been used at other bayfront sites (e.g., Mission Bay, San Francisco International Airport, and East Bay Regional Shoreline Park), the estimated 95% UCL of the mean for chemicals in shallow groundwater are below surface water screening levels for a marine habitat.

  A comparison of groundwater concentrations within the area of the HVOC plume to aquatic screening criteria indicate that PCE was detected above the aquatic screening criterion with an attenuation factor of 100 at only one location. The elevated concentration of PCE in groundwater appears to be localized and PCE is not expected to be a risk-driving COPC to aquatic receptors as a single measurement of a chemical is not representative of the concentration to which an individual organism would be exposed across the entire Site.

  Based on the analysis, COPCs in groundwater are not expected to pose a significant risk to aquatic organisms as a result of shallow groundwater potentially migrating from the Site to the San Francisco Bay. Action is not warranted for groundwater to be protective of aquatic receptors.

In summary, under the assumptions and conditions presented in the HRA, COPCs in soil may pose a theoretical cancer risk and noncancer hazard to a future worker and resident if the Site conditions were not remediated or mitigated. The primary risk driving COPCs in soil are as follows:

- Within areas of the Site excluding Zone 4, the risk-driving COPCs are arsenic and lead for a future worker and construction worker; for a future resident, the risk-driving COPCs are arsenic, lead, and TPHd.
- Within Zone 4, the risk-driving COPCs are lead and TPHd for both a future worker and a future resident. Arsenic, lead, and TPHd are risk-driving COPCs for a future construction worker.
- Within the area of the HVOC plume, PCE is the primary risk-driving COPC with contributions from cis-1,2-dichloroethene, TCE, and vinyl chloride for both a future worker and resident. PCE, cis-1,2-dichloroethene, and TCE are the risk-driving COPCs for a future construction worker.

Further action to remediate or mitigate potential exposure to these risk-driving COPCs in soil is appropriate.

In fill groundwater and the potential for vapor intrusion, the risk-driving COPCs are vinyl chloride for a future worker and benzene and vinyl chloride for a future resident. Within the area of the HVOC plume, PCE and TCE are the primary risk-driving COPCs in groundwater based on the potential for vapor intrusion with contributions from cis-1,2-dichloroethene, trans-1,2-dichloroethene, and vinyl chloride. Further action to assess the potential for vapor intrusion from groundwater for these volatile VOCs appears warranted. On the potential for VOCs in fill groundwater potentially migrating into construction trenches, no mitigation measures or engineering controls are warranted. However, within the area of the HVOC plume, further assessment appears warranted as cis,1,2-dichloroethene, PCE, TCE, and vinyl chloride are the risk-driving COPCs based on the potential for migration into a construction trench.

1. INTRODUCTION

This Health Risk Assessment (HRA) was prepared to evaluate potential human exposures and health risks associated with future uses in support of decision-making during future construction and property development for the Brisbane Baylands Operable Unit (Brisbane Baylands OU-2 or OU-2) located in Brisbane, California (the Site) (**Figure 1**).

Environmental investigations began at the Site in 1982 and are summarized in the Draft Feasibility Study/Remedial Action Plan (FS/RAP; Geosyntec Consultants, Inc. [Geosyntec], 2019). Geosyntec reviewed the results of previous investigations to develop a preliminary conceptual site model (CSM), which served as a basis to develop a Data Gap Investigation Work Plan (Geosyntec, 2018). The results from the data gap field investigation combined with the historical soil sampling results in 1990 and 1997, including results from a focused investigation in August 2006, serve as the primary dataset for this HRA.

1.1 Objective

The objective of this HRA is to provide an analysis of potential adverse health effects from exposure to chemicals detected in soil and groundwater considering future redevelopment of the Site into mixed high-density residential/commercial/industrial, research and development laboratories, retail, and recreational open space uses.[2] This document calculates estimated risks assuming no remedial actions are implemented and considers potential exposures to Site-related chemicals post-development. The intent is to provide risk managers a basis for evaluating whether action to mitigate potential health risks is warranted to support redevelopment of the Site. The results of the assessment will be used to identify the media and chemicals detected at the Site that may require further evaluation, risk management, and/or remediation measures with the overall goal of long-term protection of human health and the environment.

1.2 Approach

This HRA was prepared in general accordance with United States Environmental Protection Agency (EPA) and California Environmental Protection Agency (Cal-EPA) guidelines for the preparation of risk assessments, as specified in the following documents:

- Risk Assessment Guidance for Superfund. Volume I: Human Health Evaluation Manual (Part A) (RAGS; EPA, 1989); and
- Preliminary Endangerment Assessment Guidance Manual. Cal-EPA, Department of Toxic Substances Control (DTSC, 2015).

These documents were supplemented by additional EPA and Cal-EPA guidance documents referenced in Section 9.

The technical approaches for exposure and toxicity employed in this HRA are based on current scientific data and are consistent with regulatory guidelines. The assumptions used in this

[2] Brisbane Baylands Development Plans -www.brisbanebaylands.com/plan

assessment are conservative based on regulatory agency recommendations. As a result, risk calculations presented herein may overestimate actual risks associated with the Site.

1.3 Document Organization

The remainder of this report is organized as follows:

- Section 2, Background, presents a description of the Site and Site setting;
- Section 3, Data Evaluation and Selection of Chemicals of Potential Concern, presents the environmental sampling data from recent Site investigations that serve as the basis for this HRA;
- Section 4, Exposure Assessment, identifies receptors that may be exposed to chemicals in environmental media, the exposure pathways, and the route of potential intake;
- Section 5, Toxicity Assessment, evaluates the toxicity data available for the chemicals evaluated in this HRA;
- Section 6, Risk Characterization, provides quantitative estimates of risk and noncancer hazard and compares the estimates to target levels;
- Section 7, Uncertainties, summarizes the uncertainties inherent in evaluation of risks to human health;
- Section 8, Summary, Conclusions, and Recommendations, presents the summary, conclusions, and recommendations of the HRA; and
- Section 9, References, presents the references that are cited in the preparation of this report.

HRA tables, figures, and appendices are included at the end of this report.

2. BACKGROUND

This section provides descriptions of the Site and the Site geologic/hydrogeologic setting.

2.1 Site Description

OU-2 is approximately 140 acres (Universal Paragon Corporation, Inc. [UPC], 2011) located in the southern portion of the former Southern Pacific Transportation Company (SPTC) Brisbane Railyard, to the south of Geneva Avenue, east of Bayshore Boulevard, west of the Peninsula Corridor Joint Powers Board (Caltrain) railroad tracks, and north of the Ice House Hill (**Figures 1** and **2**). This portion of the Site is currently owned by Sunquest Properties, Inc. OU-2 also includes properties fronted on Industrial Way, on which two former underground storage tanks (USTs) were located. This portion of the Site is currently owned by Brisbane Bayshore Properties.

SPTC acquired the Brisbane Railyard property in 1896 (Levine-Fricke, 1990) and conducted operations on OU-2 from approximately 1907 until 1982 (Lipps, 2013), during which time railroad facilities, oil storage tanks, and an area designated as a "disposal site" were constructed. The major OU-2 facilities consisted of the following:

- Machine and Electric Shop – constructed in 1920, this facility was a machine shop and mechanical construction shop;[3]
- Turntable – constructed in 1908 and retired in 1942, the turntable was used to transfer locomotives to the individual servicing stalls within the roundhouse;
- Roundhouse – constructed in 1908 and still standing, this was a service area for the locomotives;
- Oil Tank – constructed in 1920, this 3-million-gallon aboveground tank stored fuel oil, commonly called Bunker C, for boilers used in the steam locomotive operation. The tank was dismantled in 1988 and 550,000 gallons of residual oil were recovered and removed for disposal;
- Tank and Boiler Shop – constructed in 1922 and retired in 1963, this shop repaired water tanks and boilers for steam locomotives. The building is still standing and is currently used by Lazzari Fuel Company, a manufacturer of charcoal briquettes; and
- Switching Yard – constructed in the early 1900s, the yard consisted of a series of tracks used for organizing and building freight trains. It was the largest part of the yard. The Peninsula Corridor Joint Powers Board (Caltrain) operates a commuter line, including four active tracks with two siding track along the eastern edge of the Site.

After SPTC's major railyard operation ceased in 1960, OU-2 was abandoned and most of the original structures have been demolished (Burns & McDonnell Engineering Company, Inc. [B&M], 2002). Various foundations and building slab outlines are still present. OU-2 includes two former UST sites located at 250/350 Industrial Way. These sites were thought to have once been

[3] Also identified as the "Machine and Erecting Shop" in historical figures.

part of the former railyard and were historically occupied by buildings related to railyard activities (Weiss Associates, Inc., 2008).

2.2 Site Geology/Hydrogeology

Based on previous investigations conducted by others, the Quaternary sediments beneath the Site consist of interlayered beds generally composed of poorly to moderately sorted unconsolidated carbonaceous silt and clay. Near the bay, the carbonaceous silt and clay are overlain by the Young Bay Mud (YBM) Formation (B&M, 2002).

Subsurface investigations indicate that the shallow lithology consists of fill materials ranging in thickness from approximately 4 to 15 feet. The fill layer is referred to historically as the A-Fill Water-Bearing Zone (A-Fill)[4] and consists primarily of sand and gravel, with lesser amounts of silt, clay, and construction debris placed atop the YBM from the late 1800s to the early 1900s. The YBM tends to act as a low permeability aquitard that impedes vertical migration of groundwater and contaminants from the A-Fill to the A-Sand zone (also known as the Colma Formation), which underlies the YBM (B&M, 2002).

The water-bearing zones at the Site are the A-Fill, the Colma Formation, and the Merced Formation. The YBM constitutes an aquitard that separates the A-Fill from the Colma Formation and confines the underlying Colma Formation. A deeper aquitard separates the Colma Formation from the Merced Formation and confines the underlying Merced Formation.

2.3 Groundwater Use

The water-bearing zones at the Site are the A-Fill Water-Bearing Zone (A-Fill), the Colma Formation, and the Merced Formation. An aquitard separates the A-Fill from the Colma Formation and confines the underlying Colma Formation. A deeper aquitard separates the Colma Formation from the Merced Formation and confines the underlying Merced Formation.

The A-Fill is characterized by poor water quality because the Site was originally under the saline waters of the San Francisco Bay. This zone is primarily recharged by local surface water infiltration and the neighboring landfill groundwater and is subject to evapotranspiration. Based on these characteristics, the groundwater in this zone is not considered to be a potential municipal supply. In May 2019, the San Francisco Regional Water Quality Control Board (SFRWQCB) granted a waiver for groundwater within OU-2 as a drinking water source, based on poor water quality associated with conductivity and adjacency to impacted groundwater.

Wells screened in the deeper water-bearing units, the Colma and Merced Formations, do not exhibit the poor water quality and yields seen in the A-Fill and; therefore, are considered to be potential municipal supplies. These two water-bearing units, which are recharged from below and from upgradient sediments to the west, are protected from the poor water quality in the A-Fill by very strong upward gradients and the above-mentioned aquitard.

[4] The A-Fill is referred to as a "Fill-Water Bearing Zone" in the Schlage OU, UPC OU-SF, UPC OU-SM, and UPC OU-2 documents.

The City of Brisbane provides the Site and surrounding residences and businesses with public water. Water service originates from the Hetch Hetchy Reservoir in the Sierra Nevada Range.

3. DATA EVALUATION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN

Data evaluation identifies the data available for use in an HRA, including the identification of chemicals of potential concern (COPCs).

3.1 Data Evaluation

The first step is to identify the analytical data set for the HRA. The most comprehensive investigation conducted at the Site in terms of number of sampling points and number of chemicals analyzed is the recent data gap investigation performed in late 2018. Based on historical land use and results from historical investigations, the Site was subdivided into six investigation sub-areas or zones consisting of the following:

- Zone 1 – Former Switching Yard, North;
- Zone 2 – Former Switching Yard, South;
- Zone 3 – Former Machine and Electric Shop Area;
- Zone 4 – Former Turntable/Oil Tank Area;
- Zone 5 – South Disposal Area; and
- Zone 6 – Industrial Way.

Soil samples collected on a 100-foot grid were analyzed for California Assessment Manual (CAM)-17 metals. Soil samples collected on the 200-foot grid were also analyzed for the following:

- Volatile organic compounds (VOCs) and total petroleum hydrocarbons (TPH) as gasoline (TPH-g), including 1,2,3-trichloropropane and dibromochloropropane;
- Semi-volatile organic compounds (SVOCs) (i.e., polynuclear aromatic hydrocarbons [PAHs]);
- TPH as diesel (TPH-d) and as motor oil (TPH-mo);
- Organochlorine pesticides (OCPs); and
- Polychlorinated biphenyls (PCBs).

Grab groundwater samples were collected for the following analyses:

- VOCs and TPH-g, including 1,2,3-trichloropropane and dibromochloropropane;
- SVOCs (PAHs);
- Dissolved CAM-17 metals and hexavalent chromium (CrVI); and
- TPH-d and TPH-mo.

The results of the data gap investigation indicate the presence of metals and petroleum hydrocarbons in shallow soil at elevated concentrations across certain areas of the Site.

Specifically, arsenic and lead were detected in nearly every sampling location across the Site at relatively elevated concentrations in shallow soil, likely resulting from the historical application of lead arsenate herbicide to the ground surface. Dissolved metals concentrations in groundwater were generally low with localized elevated concentrations.

The highest concentrations of petroleum hydrocarbons, primarily Bunker C oil, in soil and groundwater were in Zone 4, the former Oil Tank Area and the former Turntable Area.

VOCs, OCPs, and PCBs exceeded screening criteria at only a few locations, indicating that impacts to soil are localized at the Site. VOC exceedances in groundwater were similarly limited; benzene, ethylbenzene, naphthalene, and xylene exceedances were observed primarily in Zone 4, the former Oil Tank Area, and chlorinated solvents were detected near the previously identified chlorinated VOC impacts.

In addition to the results collected from the data gap investigation, historical soil sampling data for metals, collected by various consultants in 1990, 1997, and 1999, were evaluated in the HRA, as metals are not expected to attenuate with time.

Furthermore, B&M collected a limited amount of soil and groundwater data in August 2006 in an area identified as the halogenated volatile organic compound (HVOC) groundwater plume (B&M, 2007) within OU-2. In the area of the HVOC groundwater plume, referenced as the area of the HVOC plume, B&M advanced six borings (C-34 through C-39) to the top of Bay Mud (approximately 6-12 feet below ground surface [bgs]). Two soil samples, representing a shallow and a deep interval, and two grab groundwater samples, representing a shallow and deep interval, were collected from each boring for analysis of VOCs.

Because the results from the B&M August 2006 investigation indicate localized elevated concentrations of HVOCs in soil and groundwater, the data from the 2006 investigation also were evaluated in the HRA. A review of the soil sampling depth intervals and boring logs indicate that five of the soil samples (shallow soil sample C-38 from 4.5 to 5 feet bgs, and deep soil samples C-35 from 5.5 to 6 feet bgs, C-36 from 8 to 8.5 feet bgs, C-37 from 6.5 to 7 feet bgs, and C-38 from 5.5 to 6 feet bgs) were collected below the water table. Because the samples were saturated, the results were not considered representative of soil conditions and were excluded from the HRA. However, all remaining soil samples from the 2006 investigation were considered representative of unsaturated soil beneath the property and used in the HRA. Because grab groundwater samples were collected from the shallow groundwater table and deeper groundwater samples were collected from just above the Bay Mud within the same boring, the average concentration between the shallow and deep samples was considered representative of groundwater conditions.

The data described above and used in the HRA were collected and analyzed following procedures performed in accordance with EPA methods and met quality assurance/quality control (QA/QC) goals for the project. Following guidance provided by EPA in RAGS (EPA, 1989) and Guidance for Data Usability in Risk Assessments (EPA, 1992a), except for data qualified as rejected, analytical data from the Site were found to be of acceptable quality for use in the HRA. As documented in the FS/RAP (Geosyntec, 2019), some of the soil sampling results for antimony and thallium were qualified as rejected due to low average recovery results for the matrix spike/matrix

spike duplicate. Analytical results qualified as rejected were therefore excluded from the HRA, as they were considered unusable for HRA and project decision-making purposes.

A summary of the analytical results and a figure depicting the boring locations from the August 2006 investigation are presented in **Appendix A-1**. Summaries of soil, grab groundwater, and groundwater monitoring data are presented in **Appendix A-2**. **Figures 2** and **3** presents the locations where soil and groundwater samples have been collected, respectively.

The dataset from the data gap investigation includes field duplicates, which are usually two samples collected simultaneously from the same sampling location. Duplicates are collected as a measure of the homogeneity of the medium sampled in a location. For cases where a field duplicate sample result is present for the same chemical in a sample, a single representative concentration for the sample was selected as follows:

1. If there was a detection in both samples, the maximum concentration was used;
2. If there was a detection in one sample but not the other, the detected concentration was selected; and
3. If both samples were below laboratory reporting limits, the highest reporting limit was selected.

Results qualified as estimated ("J" qualified) were used in the HRA.

3.2 Selection of Chemicals of Potential Concern

All chemicals detected in at least one soil and groundwater sample were identified as COPCs to ensure the inclusion of chemicals that may pose a significant risk to human health. According to guidance for naturally-occurring materials, such as metals, an evaluation of background concentrations is important to evaluate whether the metals concentrations on the Site are consistent with naturally-occurring levels in the area, and whether they should be included in the assessment. For example, arsenic is naturally-occurring and commonly found in soil. However, because arsenic was detected at concentrations ranging from 0.21 to 1,400 milligrams per kilogram (mg/kg), with an arithmetic mean of 38.8 mg/kg (**Table 1**), exceeding background concentrations found in San Francisco Bay Area soil (i.e., 19.1 mg/kg; Lawrence Berkeley National Laboratory, 2009), arsenic was selected as a COPC. All other metals detected in at least one soil sample were identified as COPCs. Other chemicals detected in at least one soil sample include PAHs, organochloride pesticides, PCBs, and VOCs.

In groundwater, metals, VOCs, and SVOCs detected in at least one sample were selected as COPCs. In addition, TPHg, TPHd, and TPHmo were detected in at least one groundwater sample.

Tables 1 and **2** present the statistical summaries of COPCs in soil and groundwater, respectively, excluding the sampling results from the 2007 investigation described above (i.e., a total of seven soil samples and six grab groundwater samples). The tables present the number of samples, the minimum and maximum detected concentrations, and the frequency of detection.

4. EXPOSURE ASSESSMENT

The objectives of an exposure assessment are to identify receptors (populations) that may be exposed to chemicals in environmental media, the exposure pathways, and the route of potential intake. The exposure assessment is conducted within the context of a risk-based CSM, where chemical sources, potentially impacted media, exposed populations, exposure media, and exposure routes and pathways are identified. The HRA CSM, presented in **Figure 3**, represents the current understanding of the sources of COPCs, the means by which they may be released and transported within and among media, and the exposure pathways and routes by which they may contact human receptors.

4.1 Potentially Exposed Populations

To evaluate whether the levels of chemicals present in soil and groundwater at the Site would pose a risk to human populations, it is necessary to identify the populations that may potentially be exposed to these chemicals and determine the pathways by which the exposures may occur.

Given that the Site is currently vacant, there are no on-Site receptors under current conditions. Future redevelopment of the Site will likely include uses for high-density residents, commercial/industrial buildings, research and development laboratories, retail, and recreational and open space.[5] Based on these possible future uses, potentially exposed populations are a future resident, a future worker (inclusive of commercial, industrial, and retail uses), a future construction worker, and a future recreational user. Potential exposures to a recreational user are likely to be much less frequent than the daily exposure assumed for a future resident or worker. Therefore, a future worker and resident were the primary receptors evaluated in the HRA.

Although potential exposures and health risks to a future worker are generally greater than a construction worker due to longer exposure frequencies and exposure durations and any potential impacts associated with possible exposures to chemicals in soil and groundwater by a future construction worker will be managed under a Site management plan, a future construction worker was evaluated.

A nearby adjacent off-Site worker and resident were also identified as potential receptors assuming a theoretical scenario where on-Site soil particles could migrate to off-Site locations via wind erosion and dispersion.

Potential receptors typically evaluated as part of an ecologic risk evaluation include terrestrial, avian, and aquatic receptors. However, based on design plans, much of the Site is expected to be covered by 5-feet of clean import fill, artificial landscaping, buildings, and/or paved streets and parking lots, thereby eliminating the potential for exposure to soil. The presence of the developed Site and the lack of natural habitats and supporting vegetation within the immediate vicinity of the Site perimeter would limit exposures by terrestrial organisms and avian species to COPCs in soil and groundwater.

[5] Brisbane Baylands Development Plans -www.brisbanebaylands.com/plan

4.2 Potential Exposure Pathways

Based on the COPC-affected media, points of human contact with Site-related COPCs are soil, ambient air, and indoor air.

Under future conditions, the majority of the Site will likely be paved or covered by buildings and structures. The HRA conservatively assumes that the configuration and layout of the planned development could be altered and soil outside buildings could be uncovered and left exposed in the future. Therefore, in the event the Site configuration is altered, a future worker, resident, or construction worker could potentially be exposed to COPCs through incidental ingestion of soil, dermal contact with soil, and inhalation of particulates in ambient air.

Potential exposures may also occur from inhalation of vapors in outdoor and indoor air impacted by migration of compounds detected in shallow groundwater. Typically, VOCs are subject to dispersion in outdoor air, resulting in higher indoor air concentrations than outdoor air concentrations.

Some chemicals in soil can potentially leach from soil and migrate to groundwater. VOCs and metals can move in groundwater, depending on conditions and their physical chemical properties. For this HRA, it was assumed that chemicals detected in groundwater could potentially at some time migrate off-Site and discharge into surface water of the San Francisco Bay, more than 0.5 miles to the east, where marine organisms (i.e., water column and benthic organisms) could be exposed. Therefore, the HRA addresses COPCs in groundwater and the potential impacts to marine aquatic organisms in the San Francisco Bay.

Groundwater at the Site is not used for domestic or industrial purposes. In 2019, the Water Board issued a determination acknowledging that groundwater in the Fill, to a depth of approximately 15 feet below ground surface, meets exceptions (a) and (c) of State Water Resources Control Board Resolution No. 88-63 (i.e., total dissolved solids concentrations and well yield, respectively) and is not likely to be used as a source of drinking water [SFRWQCB, 2019a].

The City of Brisbane provides the Site and surrounding residences and businesses with public water. Water service originates from the Hetch Hetchy Reservoir in the Sierra Nevada Mountains. Therefore, potable use of groundwater underlying the Site is considered an incomplete exposure pathway as there are no nearby known or planned drinking water wells. Potential exposures by a future resident or a future worker to COPCs in shallow groundwater from direct exposures (i.e., dermal contact) in a small excavation is extremely unlikely.[6] However, potential inhalation exposures to volatile chemicals migrating from shallow groundwater into a construction trench, in addition to indoor air of future buildings, as described above, are possible.

Given the characteristics of the COPCs, the potential complete exposure pathways are summarized below for a future resident and worker:

[6] Direct exposures to shallow groundwater were only evaluated for a future construction worker in the health risk assessment for the adjacent Schlage OU (Mactec, 2009); however, potential exposures to groundwater at the Site are unlikely because future intrusive activities to the water table likely would require dewatering of trenches or excavations, thereby limiting dermal contact with groundwater by future receptors.

- Incidental ingestion of soil, dermal contact with soil, and inhalation of particulates or volatiles in ambient air.
- Inhalation of chemicals in groundwater migrating through the soil column and an at-grade building foundation into indoor air.
- Inhalation of volatile COPCs migrating from groundwater into ambient air within a trench.[7]
- Inhalation of COPCs in windborne dust generated from soil.
- Potential leaching of chemicals in soil to groundwater and off-Site transport of COPCs in groundwater to the San Francisco Bay.

4.3 Exposure Quantification

The following section describes how exposure was quantified for the above exposure scenarios. The assumptions and approaches used are consistent with a Reasonable Maximum Exposure (RME) approach, in which the RME scenario is defined as the "highest exposure that is reasonably expected to occur at the site."

Exposure point concentrations (EPCs) are defined as the representative chemical concentrations a receptor may contact at an exposure area over the exposure period. The concept is that individuals contact the impacted medium (i.e., soil) on a periodic and random basis. Because of the repeated and random nature of such contact, human exposure does not occur at a fixed point, but rather at a variety of points with equal likelihood that any given point within the exposure area will be the contact location on any given day. Thus, the EPCs should be representative of the average concentration within the exposure area to which a person would be exposed over the duration of the exposure. This assumption is reasonable for a high-density mixed-use scenario, where future site users do not have exclusive use of defined limited areas (e.g., backyards).

EPCs generally are estimated using measured concentrations in environmental media or estimated based on fate and transport models. Depending on a number of factors, including the distribution of the data, the proportion of the samples reported as non-detect (ND), and the total number of samples, several statistical parameters may be used to estimate EPCs. EPA's supplemental risk assessment guidance (EPA, 2002) recommends that EPC estimates should be based on the 95 percent upper confidence limit (95% UCL) of the mean to estimate an RME scenario. In the event that the calculated 95% UCLs exceed the maximum detected value, the maximum value can be used as the EPC.

As discussed in the sections below, because detailed site-specific future plans are not available at this time, the estimated 95% UCLs for COPCs in soil and groundwater were used as representative EPCs.

[7] Inhalation of volatile COPCs migrating from soil vapor into outdoor ambient air is considered less significant than in a trench as VOCs are subject to dispersion in outdoor air resulting in lower concentrations.

4.3.1 Soil

As discussed in Section 3, the highest concentrations of petroleum hydrocarbons, primarily Bunker C oil, in soil were reported in soil samples collected from Zone 4, the former Oil Tank Area and the former Turntable Area. Because the results of petroleum hydrocarbons in soil are higher in Zone 4 compared to the rest of the Site, Zone 4 was evaluated as a separate exposure unit. The boundaries of Zone 4 represent the areas of the Site where elevated concentrations of chemicals were reported in soil. Analytical data collected from locations within Zone 4 were therefore separately evaluated from data collected from the remainder of the Site, consisting of Zones 1 through 3 and Zones 5 and 6. In addition, the concentrations of HVOCs in soil samples collected from within the area previously identified as the HVOC plume are significantly higher compared to other areas of the Site. Therefore, data collected above the water table from within the area of the HVOC plume also was evaluated as a separate exposure unit.

EPCs for COPCs in soil were estimated using data for samples collected from the ground surface to 2 feet bgs. The soil depth interval of 0 to 2 feet bgs represents "potential" surface soil for a future resident and worker. Residential exposure to deeper soil in the unsaturated zone (i.e., 0 to 10 feet bgs) was not evaluated because high-density residential housing will likely be planned and residents are not expected to participate in activities that would expose them to soil deeper than 2 feet bgs, such as planting trees or installing a swimming pool. The same rationale also applies to a future worker. Conversely, a future construction worker may be exposed to COPCs in soil from 0 to 10 feet bgs. Because VOCs in soil were generally not detected at depths between 0 and 2 feet bgs, the EPCs for VOCs in soil were conservatively estimated using soil data collected from 0 to 10 feet bgs (or data collected from the unsaturated zone) to account for the inclusion of more VOCs in the estimation of health risks.

Seven of the PAHs (benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, and indeno(1,2,3-cd)pyrene) are classified as carcinogens. The Office of Environmental Health Hazard Assessment (OEHHA) of Cal-EPA has developed potency equivalency factors (PEFs) based on their potential carcinogenicity relative to benzo(a)pyrene. Concentrations of the carcinogenic, "benzo(a)pyrene-like" PAHs in soil were converted to benzo(a)pyrene equivalents (BaP TEQ) by multiplying the concentration of each PAH by the appropriate PEF developed by OEHHA and then summing the resulting toxicity-weighted concentrations.

A summary of the EPCs for soil based on either the 95% UCL or the maximum detected concentrations for the Site and Zone 4 is presented in **Table 3a**, along with the basis for choosing the EPC; the supporting output files are included in **Appendix B**. ProUCL will only calculate upper concentration limits for datasets with at least three detected values and more than five samples. For chemicals with fewer than four detects or less than five samples, the maximum sample concentration was used as the EPC. Table 3b presents a summary of the EPCs for soil collected from 0 to 10 feet bgs. **Table 3c** presents a summary of the EPCs (based on either the 95% UCL or the maximum) for unsaturated soil samples collected from the area of the HVOC plume.

4.3.2 Groundwater

EPCs for groundwater across the entire Site were based on either the 95% UCL or the maximum detected concentrations and are presented in **Table 4a**. Because the concentrations of VOCs in grab groundwater samples collected within the area of the HVOC plume are higher than samples collected across the Site, grab groundwater samples from the area of the HVOC plume also were separately evaluated. A summary of the EPCs for the COPCs reported in the areas of the HVOC plume are presented in **Table 4b.**

4.3.3 Ambient Air in Trench

The concentrations of VOCs in trench air were estimated using a modified version of the Virginia Department of Environmental Quality (VDEQ) model (VDEQ, 2019). This transport process is characterized by a "volatilization factor" (VF), which is defined as the volatile chemical concentration in outdoor air in a trench divided by the volatile chemical concentration in soil vapor estimated from groundwater. Thus, the concentrations of VOCs may be expressed as a function of the chemical concentration in soil vapor and the VF. Details of the assessment and chemical-specific VFs are presented in **Appendix C**.

4.3.4 Fugitive Dust Emissions from Soil

Chemicals detected in soil at the Site may become airborne due to fugitive dust emissions. Non-volatile compounds (e.g., SVOCs and metals) can adhere to soil particles then become airborne due to wind erosion, which could generate dust containing COPCs. Exposure to these chemicals may then occur via inhalation of airborne fugitive dust at off-Site locations. Inhalation exposure to non-volatile compounds is typically minor in fugitive dust when compared to direct ingestion exposure (EPA, 2002b). Nevertheless, a relationship can be estimated between the chemical concentration in soil and the corresponding concentration in air (secondary media) attributable to fugitive dust emissions from soil.

Potential exposure to airborne dust is estimated using a particulate emission factor (PEF) that relates the concentration of a soil constituent to the concentration of dust particles in air. The PEF represents an annual average emission rate based on wind erosion. The PEF equation can be found in Section 4.2.3 (Equation 4-5: Derivation of the PEF) of the *Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites* (EPA, 2002b). The emissions part of the PEF equation is based on the "unlimited reservoir" model developed to estimate PM_{10} emissions (particulate matter less than 10 micrometers in diameter [PM_{10}]) due to wind erosion (Cowherd et al., 1985).

The PEF was derived using the following equation (EPA, 2002b):

$$PEF = \frac{Q/C \times 3600}{\left[\left(0.036 \times (1 - V) \times \left({}^{U_m}/_{U_t}\right)^3 \times F_x\right)\right]}$$

Where:

PEF = particulate emission factor cubic meters per kilogram (m^3/kg);

Q/C = inverse of mean concentration at center of a 140-acre source (g/m^2-s per kg/m^3);

V = fraction of vegetative cover (0.5, unitless);

U_m = mean annual wind speed (4.70 m/s, average Site-specific);

U_t = equivalent threshold value of wind speed at 7 meters (11.32 m/s, EPA 2002 default)

F_x = function dependent on U_m/U_t derived using Cowherd et al. 1985 (0.19 unitless; and

0.036 = respirable fraction (g/m^2-hr).

The dispersion part of the PEF equation includes the dispersion coefficient (Q/C) in units of grams per square meter-second per kilogram per cubic meter (g/m^2-s per kg/m^3). The Q/C term was generated using the Industrial Source Complex model and varies depending on the source area, city, and climatic zone. This term accounts for the dispersion of particulate matter, once emitted, and was estimated using the following equation (EPA, 2002):

$$Q/C = A \times \exp[(\mathrm{Ln}A - B)^2 \div C]$$

Where:

A_{SITE} = aerial extent of soil impact (35 acres);

A = constant 13.1994 (EPA, 2002b);

B = constant 23.6414 (EPA, 2002b); and

C = constant 283.5307 (EPA, 2002b).

The coefficients A, B, and C are for the San Francisco area and are published in the *Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites* (EPA, 2002). A Q/C value of 54.77 g/m^2-s per kg/m^3 was estimated as the inverse of the mean concentration at the center of a 140-acre source in San Francisco, California (EPA, 2002). The PEF was therefore estimated at $6.5E10^8$ m^3/kg for the off-Site worker and resident potentially exposed to fugitive dusts in air transported via wind erosion and dispersion from on-Site soil.

The assessment to off-Site receptors is overly conservative in that the modeling assumes the receptor is located adjacent to the Site. In reality, the off-Site resident and worker are located some distance from the Site boundary thereby resulting in lower estimates of exposure.

Using COPC soil concentrations (Cs) and the estimated PEF, outdoor air concentrations (Ca) were estimated using the following equation:

$$C_a = \left(\frac{C_s}{PEF}\right)$$

Where:

Ca = concentration of COPC in ambient air (mg/m^3);
Cs = concentration of COPC in soil (mg/kg); and
PEF = particulate emission factor (m^3/kg).

4.3.5 Action Level for Airborne PM10 and COCs

Airborne particles can be classified by their particle diameter and health effects. Large particles typically settle out of the air rapidly and pose a limited health risk, but small particles may remain in the air for longer time periods and can penetrate deeply into the human respiratory system where they can cause harmful health effects. Particles 10 microns or smaller in diameter (PM_{10}) and particles 2.5 microns or smaller in diameter ($PM_{2.5}$) (i.e., respirable particles) pose the greatest health risk because they can penetrate deeply into the human respiratory system.

Appendix D presents Action Levels of respirable particulate matter (PM_{10}) and chemical-specific adhered dusts that could be transported from soil to the perimeter of the Site. The "Action Level" is intended to reduce the possibility of adverse health impacts to nearby off-site receptors and was developed using risk-based procedures that are consistent with EPA guidelines to protect human health for intermediate exposures [EPA, 1989]. The lower of either the proposed action level for PM_{10} or the chemical-specific action level based on concentrations reported in soil and assumptions regarding exposure is selected as the project-specific action level that would be used to assess whether dust mitigation measures are warranted. The results indicate that the Action Level for airborne PM10 dust that may be generated during construction activities (i.e., 0.11 mg/m^3 on an 8-hour time-weighted average basis) would be protective of off-site populations. Dust generated from on-site operations will be mitigated following Bay Area Air Quality Management District guidance.

4.4 Summary of Exposure Assessment

In summary, points of potential human contact with Site-related COPCs are soil, ambient air, and indoor air. As previously described, chemicals present in groundwater could potentially impact the aquatic environment if the chemicals migrate from the Site into the San Francisco Bay or serve as a vapor intrusion source to indoor air.

Based on the characteristics of the COPCs, the receptor and potential complete exposure pathways are summarized below:

Future Worker is assumed to work 8 hours per day, 5 days per week, 250 days per year for 25 years. Their jobs are assumed to require time spent indoors and outdoors, and access to soil is assumed to be possible. Therefore, potential exposures to chemicals in soil are assessed. In addition, soil vapor results are used to assess the potential risk of vapor intrusion into indoor air.

Future Resident is assumed to live on-Site for 350 days per year for 26 years. Residential exposure consists of 6 years as a child and 20 years as an adult. Potential exposures to chemicals in soil and in soil vapor migrating from the subsurface into indoor air of future buildings are assessed.

Future Construction Worker is assumed to work 8 hours per day, 5 days per week, 250 days per year over a 1-year period. The 1-year period is a default value provided in Cal-EPA DTSC HHRA Note 1 (DTSC, 2014), and is generally consistent with estimates of the time period that construction will take place. Further, a future construction worker is assumed to work in a trench for 1 hour per day (exposure time) for a total of 20 days (exposure frequency) over a 1-year period (exposure duration).

Exposure parameters for a future worker and resident are the same for an off-Site worker and resident.

For the HRA, it was assumed that chemicals detected in groundwater could potentially at some time migrate off-Site and discharge into surface water of San Francisco Bay, where marine organisms (i.e., water column and benthic organisms) could be exposed. Therefore, the HRA addresses COPCs in groundwater and the potential impacts to marine aquatic organisms in San Francisco Bay. In addition, volatile COPCs in groundwater have the potential to migrate through the soil column and into indoor air of future buildings.

5. TOXICITY ASSESSMENT

The toxicity assessment evaluates the toxicity data available for the COPCs. There are two major classifications of toxicants that are evaluated: noncancer threshold toxicants and cancer-causing toxicants. Noncancer toxicity factors (reference dose [RfD] and reference concentration [RfC]) and cancer toxicity factors (slope factors [SF] and Inhalation Unit Risk factors [IUR]) are used to calculate screening levels. The current toxicity values (**Table 5**) for the COPCs are available from the OEHHA Toxicity Criteria Database (OEHHA, 2019) and the EPA Integrated Risk Information System (IRIS) (EPA, 2019b), and are used to derive screening levels presented in the following sections.

In cases where the toxicity criteria for noncancer hazards are available from either OEHHA or EPA, the more conservative criterion was selected. For example, toxicity criteria from OEHHA were used for tetrachloroethene (PCE). This approach is consistent with the approach advocated by the DTSC, particularly in its version of the DTSC screening levels (DTSC, 2019), in which the noncancer RfCs and carcinogenic IURs are based on the more conservative value of the two recommended by OEHHA or EPA.

TPH constituents detected at the Site consist of petroleum hydrocarbons in the TPHg and TPHd ranges. In general, petroleum hydrocarbons are comprised of four major groups: alkanes, alkenes, cycloalkanes, and aromatics. Except for several specifically identified aromatic compounds such as benzene and certain PAHs, the hydrocarbons typically found in petroleum products are considered noncarcinogenic. If present at all, the carcinogenic hydrocarbons typically comprise a very small fraction of the mass of most petroleum releases. From a human health-risk standpoint, the main chemicals of potential concern in TPH mixtures are the aromatics. These aromatics, such as benzene, toluene, ethylbenzene, and xylene (BTEX), have been individually characterized and included in this HRA. However, these aromatic compounds represent a very small fraction of the hundreds of noncarcinogenic hydrocarbon constituents present in TPHg and TPHd ranges.

To address this issue, the SFRWQCB recommended toxicity criteria for TPH fractions were used to address noncancer hazards posed by petroleum products.

The traditional RfD approach to the evaluation of chemicals is not applied to inorganic lead because lead is typically evaluated using blood lead concentrations, rather than external dose (DTSC, 2011). Blood lead concentration is an integrated measure of internal dose, reflecting total exposure from Site-related and background sources. The EPA has determined that lead exposure can result in neurotoxic and developmental effects at very low concentrations. The primary receptors of concern are children, whose nervous systems are undergoing development and who also exhibit behavioral tendencies that increase their likelihood of exposure. These effects, which may occur at exposures so low that they may be considered to have no threshold, have been correlated to blood-lead concentrations. Because there appears to be no clear threshold for neurotoxic effects of lead in children, the EPA has not developed noncarcinogenic “safe” exposure levels (e.g., RfDs) for lead. Instead, a bio-uptake model, LeadSpread 8 (DTSC, 2011) is used by DTSC that relates measured lead concentrations in the environmental media with an estimated blood-lead level. For this HRA, OEHHA recommended screening levels of 320 and 80 mg/kg for a worker and a resident, respectively are used (OEHHA, 2009). The California Regional Water

Quality Control Board, San Francisco Bay (Water Board) recommended Environmental Screening Level (ESL; Water Board, 2019) of 160 mg/kg for lead is used for a future construction worker.

6. RISK CHARACTERIZATION

Regulatory agencies have developed screening levels for chemicals in environmental media to provide a basis for evaluating environmental conditions at a site. The screening levels are based on conservative assumptions regarding human exposures to chemicals in various media. In general, screening levels combine current toxicity values with standard exposure factors to estimate concentrations in environmental media (e.g., soil) that are protective. If a chemical is detected below its screening criteria, and potential exposure at the site of interest is not substantially different from the exposure assumptions used in deriving the screening criteria, then it is reasonable to conclude that the chemical poses a negligible risk to human health. Conversely, the presence of chemicals at concentrations that exceed the corresponding conservative screening criteria does not necessarily indicate that adverse health effects will occur, but simply indicates that further evaluation or additional investigation of the potential risks may be warranted. Because of the conservative assumptions regarding human exposure to chemicals in various media, exceeding a screening level would not necessarily indicate an adverse health effect.

The basis for the screening criteria selected to estimate the risks and hazards associated with COPCs in soil and groundwater data are described below.

6.1 Soil Screening Criteria

The SFRWQCB screening levels (SLs; SFRWQCB, 2019b) based on direct contact for a commercial/industrial worker and resident were used to evaluate soil data. For COPCs that do not have a published SL, EPA Regional Screening Levels (RSLs; EPA, 2019a) and DTSC modified screening levels (DTSC HERO Note 3, 2019) for industrial and residential land use were used.

The SLs and RSLs represent the concentration of chemicals in soil associated with a target cancer risk level of 1×10^{-6} or a target non-cancer hazard index (HI) of 1.0. They are based on standard estimates of toxicity and exposure scenarios and consider potential exposure to soil via ingestion, dermal contact, and inhalation of particulates or volatiles in outdoor ambient air.

Because arsenic is naturally-occurring and typically is present at concentrations greater than risk-based screening levels, it is appropriate to also evaluate the significance of arsenic by estimating the incremental risk and hazard from potential exposures to arsenic over naturally-occurring background. The incremental excess lifetime cancer risk and noncancer hazard is the difference between exposure to arsenic in soil and arsenic as background. For this Site, a background concentration of 19 mg/kg has been established for arsenic. Similarly, there are many natural sources of PAHs in the environment as PAHs are found in virtually all surface soils in both urban and rural areas. As such, the incremental risk and hazard to PAHs, particularly carcinogenic PAHs, also are presented. For this Site, a natural-occurring background concentration of 0.9 mg/kg is used.

For TPH, the environmental screening levels (ESLs) for TPHg, TPHd, and TPHmo were used. For lead, DTSC screening levels of 320 and 80 mg/kg were used for a future worker and resident, respectively (OEHHA, 2009). For the future worker, the screening level is equivalent to a blood lead level of 1 microgram per deciliter (µg/dL) in the fetus of an adult worker exposed to lead in

soil. Similarly, the residential screening value for inorganic lead corresponds to the soil concentration that results in a blood lead level of 1 µg/dL in children at the 90th percentile.

Because shallow groundwater at the Site is not considered a potential drinking water source, soil screening levels for the protection of groundwater were derived using surface water screening levels for a marine habitat with an attenuation factor of 100, which has been used at other bayfront sites (e.g., Mission Bay, San Francisco International Airport, and East Bay Regional Shoreline Park).

6.2 Groundwater Screening Criteria

As previously discussed, potable use of groundwater underlying the Site is considered an incomplete exposure pathway as there are no nearby known or planned drinking water wells. As such, groundwater concentrations were compared to surface water screening levels for a marine habitat, primarily ESLs published by the SFRWQCB (Table GW-2; SFRWQCB, 2019b) with an attenuation factor of 100 that has been used at other bayfront sites (e.g., Mission Bay, San Francisco International Airport, East Bay Shoreline Park). In this analysis, applicable aquatic screening criteria are being compared directly to groundwater chemical concentrations from locations well removed from a point of potential receptor exposure and without accounting for the attenuation that will likely occur as groundwater is discharged into the San Francisco Bay. The detected concentrations of constituents in groundwater prior to entering the San Francisco Bay likely would be reduced 100-fold or greater due to tidal influence given that the nearest point of the property is approximately 0.5 miles from the shoreline.

The ESLs incorporate screening values from numerous sources, including the Basin Plan (SFRWQCB, 2017); the California Toxics Rule (CTR) as promulgated in 40 Code of Federal Regulations (CFR) Part 131: Water Quality Standards, Establishment of Numerical Criteria for Priority Toxic Pollutants for the State of California (EPA, 1992b); and the California EPA technical document, A Compilation of Water Quality Goals (Central Valley Regional Water Quality Control Board, 2017). Other sources referenced include EPA's Ecotox Thresholds (EPA, 1996) and EPA's National Recommended Water Quality Criteria (EPA, 2019c). Certain ESLs for surface water in a marine habitat include values protective of fresh water, including drinking water. Criteria based on aquatic organism exposure in a marine environment were the primary values used, when available. Chronic exposures were used for comparison purposes, when available; otherwise, acute exposure values were used.

In addition, groundwater vapor intrusion screening levels were used to identify risk-driving VOCs in groundwater.

6.3 Risk Characterization

EPA guidance on protection of human health was used to aid in the interpretation of the results. The National Oil and Hazardous Substances Pollution Contingency Plan (NCP; 40 CFR 300) indicates that lifetime incremental cancer risks posed by a site should not exceed a range of one in one million (1×10^{-6}) to one hundred in one million (1×10^{-4}) and non-carcinogenic chemicals should not be present at levels expected to cause adverse health effects (i.e., a hazard quotient [HQ] greater than unity, 1).

The risk range between 1×10^{-6} and 1×10^{-4} is commonly called the "discretionary risk range." In contrast, the background risk of Americans in the general population developing cancer is approximately one chance in two (0.5 or 5.0×10^{-1}) for males and one chance in three (0.33 or 3.3×10^{-1}) for females (American Cancer Society, 2017). Estimates of lifetime excess cancer risk of less than one in one-million (1×10^{-6}) are considered *de minimis*, a risk level that is so low as to not warrant any further investigation or analysis (EPA, 1990). Within the state of California, Cal-EPA and SFRWQCB generally target the same range for acceptable risks.

Cancer risks in the 1×10^{-6} to 1×10^{-4} range or higher do not necessarily mean that adverse health effects will be observed. Current methodology for estimating the carcinogenic potential of chemicals is believed to be conservative.

For non-cancer health effects, hazard quotients were calculated by dividing the EPCs by the corresponding non-cancer-based screening levels. For groundwater, concentrations for COPCs were compared against SFRWQCB vapor intrusion screening levels for a future resident and a future worker. In cases where individual chemicals potentially act on the same organs or result in the same health endpoint (e.g., respiratory irritants), potential additive effects may be addressed by calculating an HI based on the sum of the HQs. This approach is generally believed to overestimate the potential for noncarcinogenic health effects due to simultaneous exposure to multiple chemicals because it does not account for different toxic endpoints (EPA, 1989; National Research Council, 1988; Risk Commission, 1997; Seed et al., 1995). However, it can be used as a screening tool to rapidly identify those exposure scenarios for which exposure to multiple chemicals does not pose a noncarcinogenic health risk. As indicated above, an HI of less than or equal to 1 indicates acceptable levels of exposure for chemicals having an additive effect.

Similarly, the theoretical excess lifetime cancer risks are calculated from the EPCs of each COPC in soil and groundwater and the corresponding screening level. For carcinogens, the theoretical excess lifetime cancer risk was calculated by dividing the measured concentrations in each media by the screening level and then multiplying by the target risk level used in the development of the screening levels (i.e., one-in-one million or 1×10^{-6}). As with HIs, the estimated excess cancer risks for each chemical and exposure route are summed regardless of toxic endpoint to estimate the total excess cancer risk for the exposed individual.

For this HRA, an HI of 1 and excess cancer risk of 1×10^{-5} are used for a future worker. For a future resident, an HI of 1 and excess cancer risk of 1×10^{-6} are used. These target thresholds are consistent with the federal and state criteria described above.

6.4 Risk Characterization Results

Cumulative HIs and excess lifetime cancer risks from potential exposures to COPCs in soil for a future worker are presented in **Tables 6** and **7** for the Site and Zone 4, respectively. **Table 8** presents the cumulative HIs and excess lifetime cancer risks to a future worker from potential exposures to COPCs in soil from the area of the HVOC plume. **Tables 9** and **10** present the cumulative HIs and excess lifetime cancer risks for a future resident based on samples collected from the Site and Zone 4, respectively. **Table 11** presents the cumulative HIs and excess lifetime cancer risks to a future resident from potential exposures to COPCs in soil from the area of the HVOC plume. **Tables 12** and **13** present the cumulative HIs and excess lifetime cancer risks for a

future construction worker based on samples collected from the Site and Zone 4, respectively. **Table 14** presents the cumulative HIs and excess lifetime cancer risks to a future construction worker from potential exposures to COPCs in soil from the area of the HVOC plume.

Tables 15 through **18** present the cumulative HIs and excess lifetime cancer risks for a future off-site worker and resident from possible inhalation exposures of fugitive dusts. **Tables 19a** and **19b** presents a comparison of groundwater concentrations to vapor intrusion screening levels. **Tables 20a** and **20b** presents the cumulative HIs and excess lifetime cancer risks from possible inhalation exposures of volatile COPCs in groundwater migrating into a trench for a future construction worker. Finally, **Tables 21a** and **21b** presents a comparison of groundwater concentrations to screening levels that are protective of aquatic receptors.

6.4.1 Future Worker

For a future worker, the cumulative HI and cumulative excess lifetime cancer risk from COPCs in soil from 0 to 2 feet bgs are 17 and 2×10^{-4}, respectively. Arsenic and lead are the primary risk-driving COPCs. Lead is a risk-driving COPC in soil as the estimated 95% UCL of 1,112 mg/kg exceeds the worker screening level of 320 mg/kg. The HQs and cancer risks for all other COPCs are less than 1 and 1×10^{-6}, respectively.

For arsenic, the estimated noncancer HQ and excess lifetime cancer risk are 16 and 2×10^{-4}, respectively. The estimated background noncancer hazard quotient and excess lifetime cancer risk to arsenic are 5.3 and 6×10^{-5}, respectively. Based on these estimates, the incremental noncancer hazard and excess lifetime cancer risk is the difference between baseline and background. The incremental noncancer hazard and excess lifetime cancer risk to arsenic in soil are 11 and 1×10^{-4}, respectively. The results of the assessment indicate that the incremental increase in risk over background is approximately two times higher than baseline.

Within Zone 4, the cumulative HI and cumulative excess lifetime cancer risk from COPCs in soil from 0 to 2 feet bgs are 7.3 and 4×10^{-5}, respectively. Lead and TPHd are the primary risk-driving COPCs. The estimated 95% UCL for arsenic is 12.6 mg/kg and below naturally-occurring background. Without arsenic as a COPC in soil, the cumulative HI and cancer risk are 3.7 and 3×10^{-6}, respectively. Except for an HQ of 3.4 for TPHd, the HQs and cancer risks for all other COPCs are 1 and 1×10^{-6} or less, respectively. Lead is a risk-driving COPC in soil as the estimated 95% UCL of 541 mg/kg exceeds the worker screening level of 320 mg/kg.

Within the area of the HVOC plume, the cumulative HI and cumulative excess lifetime cancer risk from COPCs in soil from 0 to 10 feet bgs based on the maximum concentrations are 64 and 2×10^{-3}, respectively. PCE is the primary risk-driving COPC. Other COPCs contributing to the cumulative risk and HI are cis-1,2-dichloroethene and trichloroethene (TCE).

For volatile COPCs in groundwater potentially migrating from the top of the water table into the indoor air of occupied buildings, vinyl chloride is the primary risk-driving COPC. Within the HVOC plume, cis-1,2-dichloroethene, PCE, trans-1,2-dichloroethene, TCE, and vinyl chloride are the risk-driving COPCs as the EPCs exceed commercial/industrial screening levels.

6.4.2 Future Resident

For a future resident, in the absence of any remediation or mitigation efforts, the baseline cumulative HI and cumulative excess lifetime cancer risk from COPCs in soil from 0 to 2 feet bgs are 230 and 9×10^{-4}, respectively. Arsenic, lead, and TPHd are the risk-driving COPCs. Lead is a risk-driving COPC in soil, as the estimated 95% UCL of 1,112 mg/kg exceeds the residential screening level of 80 mg/kg. The HQ for TPHd is 1.4.

For arsenic, the estimated noncancer HQ and excess lifetime cancer risk are 220 and 9×10^{-4}, respectively. The estimated background noncancer HQ and excess lifetime cancer risk to arsenic are 73 and 3×10^{-4}, respectively. The incremental noncancer hazard and excess lifetime cancer risk to arsenic in soil are 150 and 6×10^{-4}, respectively. The incremental increase in risk for arsenic over background is approximately two times higher than baseline. Similarly, while the estimated cancer risk to BaP TEQ is 6×10^{-6}, the 95% UCL of 0.61 mg/kg is lower than the background concentration of 0.9 mg/kg.

Within Zone 4, the cumulative HI and cumulative excess lifetime cancer risk from COPCs in soil from 0 to 2 feet bgs are 69 and 2×10^{-4}, respectively. Lead and TPHd are the primary risk-driving COPCs. Lead is a risk-driving COPC in soil as the estimated 95% UCL of 541 mg/kg exceeds the residential screening level of 80 mg/kg. The HQ for TPHd is 16. The estimated 95% UCL for arsenic is 12.6 mg/kg and below naturally-occurring background. The HQs and cancer risks for all other COPCs are less than 1 and 1×10^{-6}, respectively. While the estimated cancer risk to BaP TEQ is 6×10^{-6}, the 95% UCL of 0.6 mg/kg is lower than the background concentration of 0.9 mg/kg.

Within the area of the HVOC plume, the cumulative HI and cumulative excess lifetime cancer risk from COPCs in soil from 0 to 10 feet bgs are 290 and 9×10^{-3}, respectively. PCE is the primary risk-driving COPC. Other COPCs contributing to the cumulative risk and HI are cis-1,2-dichloroethene, TCE, and vinyl chloride.

For volatile COPCs in groundwater potentially migrating from top of the water table into indoor air of structures, benzene and vinyl chloride exceed residential screening levels. Within the HVOC plume, cis-1,2-dichloroethene, ethylbenzene, PCE, trans-1,2-dichloroethene, TCE, and vinyl chloride exceed residential screening levels.

6.4.3 Future Construction Worker

For a future construction worker, without any site remediation or mitigation, the cumulative HI and cumulative excess lifetime cancer risk from COPCs in soil from 0 to 10 feet bgs are 58 and 3×10^{-5}, respectively. Arsenic and lead are the primary risk-driving COPCs. For arsenic, the estimated noncancer HQ and excess lifetime cancer risk are 54 and 3×10^{-5}, respectively. The estimated background noncancer hazard quotient and excess lifetime cancer risk to arsenic are 19 and 9×10^{-6}, respectively. Lead is a risk-driving COPC in soil as the estimated 95% UCL of 1,320 mg/kg exceeds the worker screening level of 160 mg/kg. The HQs and cancer risks for all other COPCs are less than 1 and 1×10^{-6}, respectively.

Within Zone 4, the cumulative HI and cumulative excess lifetime cancer risk from COPCs in soil from 0 to 10 feet bgs are 67 and 3×10^{-5}, respectively. Arsenic, lead and TPHd are the risk-driving COPCs. The HQs and cancer risks for all other COPCs are 1 and 1×10^{-6} or less, respectively.

Within the area of the HVOC plume, the cumulative HI and cumulative excess lifetime cancer risk from COPCs in soil from 0 to 10 feet bgs are 88 and 3×10^{-4}, respectively. PCE is the primary risk-driving COPC. Other COPCs contributing to the cumulative risk and HI are cis-1,2-dichloroethene and TCE.

For volatile COPCs potentially migrating from fill groundwater into trench air, without any site remediation or mitigation, the cumulative HI and cumulative excess lifetime cancer risk are 0.3 and 4×10^{-8}, respectively. Within the area of the HVOC plume, the cumulative HI and cumulative excess lifetime cancer risk are 69 and 2×10^{-4}, respectively. Cis-1,2-dichlroethene, PCE, TCE, and vinyl chloride are the risk-driving COPCs.

6.4.4 Off-Site Worker and Resident

For potential exposures to air via fugitive dusts from 0 to 2 feet bgs at the Site, the cancer risk and noncancer hazard estimates for an off-Site worker and resident are below (safer than) the noncancer hazard index of 1 and cancer risk level of 1×10^{-6}.

In addition, action levels were estimated for PM_{10} and COPCs in dust to reduce the possibility of adverse health impacts to nearby off-site receptors. As indicated in **Appendix D**, maintaining respirable particulates below the PM_{10} action level (0.11 mg/m^3) will ensure that both PM_{10} emissions and COPC dust particulates from the project will not reasonably cause the 24-hour time weighted average (TWA) for PM_{10} or the risk-based concentrations to be exceeded.

6.4.5 Groundwater Impacts to Aquatic Receptors

Analytical results that were considered representative of COPCs flowing from the Site to off-Site areas, including the San Francisco Bay, were evaluated. According to EPA's Office of Water, concentrations of dissolved metals, rather than total metals, are used to set and measure compliance with water quality standards because dissolved metal concentrations more closely approximate the bioavailable fraction of metals in the water column (EPA, 1996).

Because grab groundwater sampling may result in turbid samples (i.e., turbidity refers to the presence of suspended particles in the sample), sample turbidity can cause bias as a result of the adsorption of chemicals onto, or the release of chemicals from, the surface of particles in the sample (Yeskis and Zavala, 2002). Sample collection practices that induce artificially high levels of turbidity have been shown to have the greatest negative impacts on sample quality (Puls and Powell, 1992). The goal is to consider groundwater data that are representative of existing conditions that could potentially affect San Francisco Bay.

The potential for COPCs in groundwater to pose a risk to aquatic organisms in the San Francisco Bay was evaluated by comparing representative dissolved-phase groundwater data to published environmental screening levels for aquatic receptors to assess the potential adverse impacts on the marine habitat. For COPCs in groundwater, the comparison of groundwater concentrations to surface water criteria is provided for screening-level purposes, and actual surface water concentrations would likely be significantly less due to surface water (i.e., San Francisco Bay) – groundwater interactions in the tidal zone. This method of evaluating chemicals also should be considered very conservative because it does not consider the potential dilution of groundwater from the Site as it enters the San Francisco Bay. In addition, the criteria used in this evaluation assume that the aquatic organisms are living in the water being evaluated. In this analysis,

applicable aquatic screening criteria are being compared directly to groundwater chemical concentrations from locations well removed from a point of potential receptor exposure and without accounting for the attenuation that will likely occur as groundwater is discharged into the San Francisco Bay. Therefore, exceedance of these levels in groundwater is not necessarily indicative of a significant risk to aquatic organisms in the San Francisco Bay.

The chronic aquatic criteria used in this screening evaluation are considered conservative. The detected concentrations of constituents in groundwater prior to entering the San Francisco Bay likely would be reduced 100-fold or greater due to tidal influence and dilution/adsorption given that the nearest point of the property is approximately 0.5 miles from the shoreline. Based on an attenuation factor of 100 that has been used at other bayfront sites (e.g., Mission Bay, San Francisco International Airport, East Bay Shoreline Park), the estimated EPCs for all groundwater COPCs are below applicable screening criteria (**Table 17a**). Based on a comparison of groundwater concentrations within the area of the HVOC plume to aquatic screening criteria, PCE was detected above the aquatic screening criterion with an attenuation factor of 100 at one location (C-36; **Table 17b**). Because elevated concentrations of PCE in groundwater appear to be localized, PCE is not expected to be a risk-driving COPC to aquatic receptors.

In summary, concentrations of chemicals detected in groundwater across the entire Site prior to entering the San Francisco Bay would be reduced 100-fold or greater based on the distance from the Site perimeter to the San Francisco Bay and the dilution of groundwater as it enters the San Francisco Bay. Based on an attenuation factor of 100 that has been applied at other bayfront sites, the estimated EPCs for all chemicals from the Site, except for PCE within the area of the HVOC plume, are below applicable screening criteria. Because elevated concentrations of PCE in groundwater appear to be localized within a limited area of the Site, PCE is not expected to be a risk-driving COPC to aquatic receptors.

7. UNCERTAINTIES

As in any risk assessment, the estimates of risk have many associated uncertainties. The procedures used result in conditional estimates of risk that incorporate assumptions concerning chemical toxicity, human exposure, and unavoidable uncertainties. As a result, the risk estimates presented herein have associated uncertainties reflecting the limitations in Site concentrations, exposure assumptions, and chemical toxicity.

The assumed exposure durations represent upper-bound estimates of the total amount of time that an individual may be in one location. For example, the soil screening levels assume the receptor is at the same residential and work location for the entire duration of the exposure period.

Further, it is assumed that under future scenarios, direct contact with exposed soil is potentially complete. However, under a typical commercial or high-density residential land use scenarios, much of the soil will be covered with asphalt pavement or buildings, thereby limiting any exposures.

Uncertainty in the toxicity assessment arises for those chemicals which rely on animal studies as the basis for determining the appropriate toxicity value for effects on humans. Toxicity values typically assume that adverse effects observed in animal toxicity experiments would also be observed in humans. Toxicity values are typically developed using conservative uncertainty factors, which result in an overestimation of risk.

It is assumed that the total risk associated with exposure to multiple COPCs is equal to the sum of the individual risks for each chemical (i.e., the risks are additive). Other possible interactions include synergism, where the total risk is higher than the sum of the individual risks, and antagonism, where the total risk is lower than the sum of the individual risks. Relatively little data are available regarding potential chemical interactions after environmental exposure to chemical mixtures. Some studies have been carried out in rodents given simultaneous doses of multiple chemicals. The results of these studies indicated that no interactive effects were observed for mixtures of chemicals affecting different target organs (i.e., each chemical acted independently), whereas antagonism was observed for mixtures of chemicals affecting the same target organ, but by different mechanisms (Risk Commission, 1997).

In summary, because this risk evaluation contains multiple sources of uncertainty, simplifying assumptions were made so that potential health risks can be estimated quantitatively. The exact amount of uncertainty cannot be quantified, and the HRA is intended to overestimate rather than underestimate probable risk.

8. SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Geosyntec conducted an HRA to evaluate potential adverse health effects as a result of potential exposure to chemicals in soil and groundwater. Potential noncarcinogenic HIs and theoretical excess lifetime cancer risks were estimated quantitatively for a future worker and a future resident. Given the distribution of chemicals detected in soil, separate exposure areas were evaluated and include: i) all areas of the Site excluding Zone 4; and ii) Zone 4. The results of the HRA are described below.

8.1 HRA Summary

- For a future worker, in the absence of any remediation or mitigation efforts, the cumulative HI and cumulative excess lifetime cancer risk from COPCs in soil from 0 to 2 feet bgs are 17 and 2×10^{-4}, respectively. Arsenic and lead are the risk-driving COPCs. The HQs and cancer risks for all other COPCs are less than 1 and 1×10^{-6}, respectively. For arsenic, the estimated noncancer HQ and excess lifetime cancer risk are 16 and 2×10^{-4}, respectively. However, the estimated background noncancer HQ and excess lifetime cancer risk to arsenic are 5.3 and 6×10^{-5}, respectively. Based on these estimates, the incremental noncancer hazard and excess lifetime cancer risk is the difference between baseline and background. The incremental noncancer hazard and excess lifetime cancer risk to arsenic in soil are 11 and 1×10^{-4}, respectively. The results of the assessment indicate that the incremental increase in risk over background is approximately two times higher than baseline.

  Within Zone 4, the cumulative HI and cumulative excess lifetime cancer risk from COPCs in soil from 0 to 2 feet bgs are 7.3 and 4×10^{-5}, respectively. Lead and TPHd are the risk-driving COPCs. The estimated 95% UCL for arsenic is 12.6 mg/kg and below naturally-occurring background. Without arsenic as a COPC in soil, the cumulative HI and cancer risk are 3.7 and 3×10^{-6}, respectively.

  Within the area of the HVOC plume, the cumulative HI and cumulative excess lifetime cancer risk from COPCs in soil from 0 to 10 feet bgs are 64 and 2×10^{-3}, respectively. PCE is the primary risk-driving COPC. Other COPCs contributing to the cumulative risk and HI are cis-1,2-dichloroethene TCE, and vinyl chloride.

  For volatile COPCs in groundwater potentially migrating from top of the water table into indoor air of future structures, vinyl chloride is the primary risk-driving COPC. Within the HVOC plume, cis-1,2-dichloroethene, ethylbenzene, PCE, trans-1,2-dichloroethene, TCE, and vinyl chloride exceed commercial/industrial screening levels.

- For a future resident, in the absence of any remediation or mitigation efforts, the baseline cumulative HI and cumulative excess lifetime cancer risk from COPCs in soil from 0 to 2 feet bgs are 230 and 9×10^{-4}, respectively. Arsenic, lead, and TPHd are the risk-driving COPCs. For arsenic, the estimated noncancer HQ and excess lifetime cancer risk are 220 and 9×10^{-4}, respectively. The estimated background noncancer HQ and excess lifetime cancer risk to arsenic are 73 and 3×10^{-4}, respectively. The incremental noncancer hazard and excess lifetime cancer risk to arsenic in soil are 150 and 6×10^{-4}, respectively. The incremental increase in risk for arsenic over background is approximately two times higher than baseline. Similarly, while

the estimated cancer risk to BaP TEQ is 6×10^{-6}, the 95% UCL of 0.61 mg/kg is lower than the background concentration of 0.9 mg/kg.

Within Zone 4, the cumulative HI and cumulative excess lifetime cancer risk from COPCs in soil from 0 to 2 feet bgs are 69 and 2×10^{-4}, respectively. Lead and TPHd are the risk-driving COPCs. The estimated 95% UCL for arsenic is 12.6 mg/kg and below naturally-occurring background. Without arsenic as a COPC, the cumulative excess lifetime cancer risk from COPCs in soil are 20 and 3×10^{-5}, respectively. The HQs and cancer risks for all other COPCs are less than 1 and 1×10^{-6}, respectively.

Within the area of the HVOC plume, the cumulative HI and cumulative excess lifetime cancer risk from COPCs in soil from 0 to 10 feet bgs are 290 and 9×10^{-3}, respectively. PCE is the primary risk-driving COPC. Other COPCs contributing to the cumulative risk and HI are cis-1,2-dichloroethene, TCE, and vinyl chloride.

For volatile COPCs in groundwater potentially migrating from top of the water table into indoor air of future structures, benzene and vinyl chloride exceed residential screening levels. Within the HVOC plume, cis-1,2-dichloroethene, ethylbenzene, PCE, trans-1,2-dichloroethene, TCE, and vinyl chloride exceed residential screening levels.

- For a future construction worker, without any site remediation or mitigation, the cumulative HI and cumulative excess lifetime cancer risk from COPCs in soil from 0 to 10 feet bgs are 58 and 3×10^{-5}, respectively. Arsenic and lead are the primary risk-driving COPCs. For arsenic, the estimated noncancer HQ and excess lifetime cancer risk are 54 and 3×10^{-5}, respectively. The estimated background noncancer hazard quotient and excess lifetime cancer risk to arsenic are 19 and 9×10^{-6}, respectively. The HQs and cancer risks for all other COPCs are less than 1 and 1×10^{-6}, respectively.

  Within Zone 4, the cumulative HI and cumulative excess lifetime cancer risk from COPCs in soil from 0 to 10 feet bgs are 79 and 3×10^{-5}, respectively. Arsenic, lead and TPHd are the risk-driving COPCs. The HQs and cancer risks for all other COPCs are 1 and 1×10^{-6} or less, respectively.

  Within the area of the HVOC plume, the cumulative HI and cumulative excess lifetime cancer risk from COPCs in soil from 0 to 10 feet bgs based on the maximum concentrations are 88 and 3×10^{-4}, respectively. PCE is the primary risk-driving COPC. Other COPCs contributing to the cumulative risk and HI are cis-1,2-dichloroethene and TCE.

  For volatile COPCs potentially migrating from groundwater into trench air, without any site remediation or mitigation, the cumulative HI and cumulative excess lifetime cancer risk are 0.3 and 4×10^{-8}, respectively. Within the area of the HVOC plume, the cumulative HI and cumulative excess lifetime cancer risk are 69 and 2×10^{-4}, respectively; cis-1,2-dichloroethene, PCE, TCE, and vinyl chloride are the risk-driving COPCs.

  For an off-Site worker and resident, the cumulative HI and cumulative excess lifetime cancer risk from COPCs in soil from 0 to 2 feet bgs migrating into air as fugitive dust are less than 1 and 1×10^{-6}, respectively. In addition, action levels were estimated assuming short-term exposures to airborne particles 10 microns or smaller in diameter (PM10) or COPC adhered

dust that may be present in air along the perimeter of the Site. The results of the analysis indicate that the project respirable action level for PM10 can be used to limit concentrations of non-volatile risk-based COPCs as well as PM10. Maintaining respirable particulates below the PM10 action level will ensure that both PM10 emissions and risk-based COPC dust particulates will not reasonably result in unacceptable exposures.

- Groundwater concentrations were compared to surface water screening levels for a marine habitat. Potential exposures to aquatic receptors from COPCs in groundwater are not expected to pose a significant risk to aquatic organisms because the shoreline of the San Francisco Bay is located approximately 0.5 miles east of the Site and attenuation (e.g., adsorption) and dilution are expected to occur. Surface water screening levels for a marine habitat used in the analysis do not consider dilution and/or attenuation of groundwater upon discharge to surface water. The detected concentrations of dissolved constituents in groundwater at the Site prior to entering the San Francisco Bay would likely be reduced 100-fold or greater due to factors such as adsorption of dissolved constituents to soil and dilution effects from tidal influence. Based on an attenuation factor of 100 that has been used at other bayfront sites (e.g., Mission Bay, San Francisco International Airport, and East Bay Regional Shoreline Park), the estimated 95% UCL of the mean for chemicals in shallow groundwater are below surface water screening levels for a marine habitat.

  A comparison of groundwater concentrations within the area of the HVOC plume to aquatic screening criteria indicate that PCE was detected above the aquatic screening criterion with an attenuation factor of 100 at only one location. The elevated concentration of PCE in groundwater appears to be localized and PCE is not expected to be a risk-driving COPC to aquatic receptors as a single measurement of a chemical is not representative of the concentration to which an individual organism would be exposed across the entire Site.

  Based on the analysis, COPCs in groundwater are not expected to pose a significant risk to aquatic organisms as a result of shallow groundwater potentially migrating from the Site to the San Francisco Bay. Action is not warranted for groundwater to be protective of aquatic receptors.

8.2 Conclusions and Recommendations

Under the assumptions and conditions presented in the HRA, COPCs in soil may pose a theoretical risk and noncancer hazard to a future worker and resident if the Site conditions were not remediated or mitigated. The primary risk driving COPCs in soil are as follows:

- Within areas of the Site excluding Zone 4, the risk-driving COPCs are arsenic and lead for a future worker and construction worker; for a future resident, the risk-driving COPCs are arsenic, lead, and TPHd.
- Within Zone 4, the risk-driving COPCs are lead and TPHd for both a future worker and a future resident. Arsenic, lead, and TPHd are risk-driving COPCs for a future construction worker.
- Within the area of the HVOC plume, PCE is the primary risk-driving COPC with contributions from cis-1,2-dichloroethene, TCE, and vinyl chloride for both a future worker and resident.

PCE, cis-1,2-dichloroethene, and TCE are the risk-driving COPCs for a future construction worker.

Further action to remediate or mitigate potential exposure to these risk-driving COPCs in soil is appropriate.

In fill groundwater and the potential for vapor intrusion, the risk-driving COPCs are vinyl chloride for a future worker and benzene and vinyl chloride for a future resident. Within the area of the HVOC plume, PCE and TCE are the primary risk-driving COPCs in groundwater based on the potential for vapor intrusion with contributions from cis-1,2-dichloroethene, trans-1,2-dichloroethene, and vinyl chloride. Further action to assess the potential for vapor intrusion from groundwater for these volatile VOCs appears warranted. For VOCs in fill groundwater potentially migrating into a construction trench, no mitigation measures or engineering controls are warranted. However, within the area of the HVOC plume, further assessment appears warranted as cis,1,2-dichloroethene, PCE, TCE, and vinyl chloride in groundwater are the risk-driving COPCs based on the potential for migrations into a construction trench.

The conclusions of this risk assessment are based on the information available at the time the risk assessment was conducted. As new information becomes available, the assumptions and conclusions should be reevaluated.

9. REFERENCES

American Cancer Society. 2017. Cancer Facts and Figures. Website address: http://www.cancer.org/docroot/stt/stt_0.asp

Burns & McDonnell Engineering Company, Inc. (B&M). 2002. Revised Remedial Action Plan, Southern Portion of the Former Bayshore Railyard (OU-2), Brisbane, California. February.

B&M. 2007. OU-2 Additional Investigation in the area of HVOC plume, submitted to Regional Water Quality Control Board. 19 February.

Central Valley Regional Water Quality Control Board. 2017. A Compilation of Water Quality Goals: California Environmental Protection Agency, Regional Water Quality Control Board, Central Valley Region. October.

Department of Toxic Substances Control (DTSC). 2011. User's Guide to LeadSpread 8 and Recommendation for Evaluation of Lead Exposures in Adults.

DTSC. 2015. Preliminary Endangerment Assessment Guidance Manual, Sacramento, California. Revised October.

DTSC. 2019. Human Health Risk Assessment (HHRA) Note 3 – DTSC-Modified Screening Levels. April.

Geosyntec Consultants, Inc. (Geosyntec). 2018. Data Gap Investigation Work Plan. 27 November.

Geosyntec. 2019. Draft Feasibility Study/Remedial Action Work Plan. In press.

Lawrence Berkeley National Laboratory. 2009. Analysis of Background Distributions of Metals in Soil at Lawrence Berkeley National Laboratory, Environmental Restoration Program. Revised April.

Levine-Fricke. 1990. Draft Supplemental Remedial Investigation, Data Study Report, The Bayshore Railyard, Brisbane, California. 18 July.

Lipps J, 2013. "Caltrain150: Rise and Fall of the Bayshore Roundhouse". https://peninsulamoves.org/2013/11/07/caltrain150-rise-and-fall-of-the-bayshore-roundhouse/.

MACTEC. 2009. Feasibility Study Remedial Action Plan, Appendix E. Risk-Based Target Redevelopment Cleanup Goals. Schlage Operable Unit, San Francisco, California. November.

National Research Council. 1988. Chemical Mixtures: National Academy Press, Washington, D.C.

Office of Environmental Health Hazard Assessment (OEHHA). 2009. Revised California Human Health Screening Levels for Lead.

OEHHA. 2019. Toxicity Criteria Database. Website address: http://oehha.ca.gov/tcdb/index.asp

Presidential/Congressional Commission of Risk Assessment and Risk Management. 1997. Final Report, Volume 2, Risk Management in Regulatory Decision-Making.

Puls, R.W., and R.M. Powell. 1992. Acquisition of Representative Ground Water Quality Samples for Metals, Ground Water Monitoring Review, v. 12, no. 3, p. 167-176.

San Francisco Bay Regional Water Quality Control Board (SFRWQCB). 2017. Basin (Region 2) Water Quality Control Plan. 4 May.

SFRWQCB. 2019a. Concurrence with the Technical Evaluation of Groundwater Quality Report, Brisbane Baylands, San Mateo County. 6 May.

SFRWQCB. 2019b. Environmental Screening Levels (ESLs). July.

Seed, J., R.P. Brown, S.S. Olin, and J.A. Foran. 1995. Chemical mixtures: Current risk assessment methodologies and future directions: Regulatory Toxicology and Pharmacology, v. 22 p. 76-94.

United States Environmental Protection Agency (EPA). 1989. Risk Assessment Guidance for Superfund (RAGS) Manual Part A. Interim Final. OSWER Directive 9285.701A. Office of Solid Waste and Emergency Response, Washington, D.C.

EPA. 1990. National Oil and Hazardous Substances Pollution Contingency Plan, Federal Register, v. 55, p. 8666.

EPA. 1992a. Guidance for Data Useability in Risk Assessment, Final. April.

EPA. 1992b. Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants; States' Compliance Final Rule (National Toxics Rule), U.S. Environmental Protection Agency, Code of Federal Regulations, Title 40, Part 131.

EPA. 1996. Ecotox Thresholds, Office of Solid Waste and Emergency Response, Publication 9345.0-12FSI, EPA 540/F-95/038, PB95-963324. January.

EPA. 2002. Supplemental Guidance to RAGS, Calculating the Concentration Term, Office of Solid Waste and Emergency Response.

EPA. 2011. National Air Toxics Assessment. Website address: https://www.epa.gov/national-air-toxics-assessment/2011-national-air-toxics-assessment

EPA. 2019a. Regional Screening Levels (RSLs) for Chemical Contaminants at Superfund Sites. May. Website address: http://www.epa.gov/region9/superfund/prg/

EPA. 2019b. Integrated Risk Information System (IRIS): Online database. Website address: http://www.epa.gov/iris/

EPA. 2019c. National Recommended Water Quality Criteria. December.

Universal Paragon Corporation, Inc., 2011. Areas/Boundaries of OU1 and OU-2. E-mail from Mr. Howard Pearce of UPC to Mr. Krzysztof Jesionek of Geosyntec. 7 December.

Weiss Associates, Inc. 2008. Draft Site Characterization Report, Former UST Sites, 250 and 350 Industrial Way, Brisbane, California. 31 March.

Yeskis, D., and B. Zavala. 2002. Ground-Water Sampling Guidelines for Superfund and RCRA Project Managers: Washington, D.C., U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response, Ground Water Forum Issue Paper, EPA/542/S-02/001.

TABLES

TABLE 1

SUMMARY STATISTICS OF CHEMICALS IN SOIL SAMPLES[1]

Brisbane Baylands OU-2

Brisbane, California

Analyte	No. of Samples	No. of Detections	No. of Non-Detects	Frequency of Detection	Min Detected Conc.	Mean Detected Conc.	Max Detected Conc.	Minimum Detection Limit[2]	Maximum Detection Limit[2]
Metals (milligrams per kilogram - mg/kg)									
Antimony	1245	1071	174	86%	0.22	16.64	4300	0.17	120
Arsenic	1251	1220	31	98%	0.21	38.84	1400	0.2	15
Barium	1250	1250	0	100%	5.7	246.33	23,000	0	0
Beryllium	1243	811	432	65%	0.075	0.567	120	0.029	2.9
Cadmium	1249	1097	152	88%	0.03	1.62	66	0.025	2.5
Chromium	1244	1244	0	100%	1.7	66.28	8,700	0	0
Cobalt	1243	1239	4	100%	0.58	14.49	4400	2.5	20
Copper	1251	1251	0	100%	4.5	497.08	120,000	0	0
Lead	1251	1250	1	100%	0.39	942.66	28,000	1	1
Mercury	1244	1202	42	97%	0.0022	0.58	22	0.0024	0.1
Molybdenum	1246	841	405	67%	0.14	2.10	250	0.13	10
Nickel	1243	1243	0	100%	1.7	54.25	3400	0	0
Selenium	1243	667	576	54%	0.27	2.02	39	0.1	220
Silver	1247	512	735	41%	0.11	2.45	40	0.045	73
Thallium	1109	178	931	16%	0.33	1.67	32	0.13	210
Vanadium	1243	1243	0	100%	1.6	89.6	45000	0	0
Zinc	1251	1251	0	100%	10	598.2	18,000	0	0
Volatile Organic Compounds (VOCs - micrograms per kilogram - µg/kg) and Total Petroleum Hydrocarbons as Gasoline (milligrams per kilogram - mg/kg)									
1,1,1,2-Tetrachloroethane	343	0	343	0%	0	0	0	0.36	1200
1,1,1-Trichloroethane	343	1	342	0%	120	120	120	0.18	600
1,1,2,2-Tetrachloroethane	343	0	343	0%	0	0	0	0.36	600
1,1,2-Trichloro-1,2,2-trifluoroethane	343	1	342	0%	7.5	7.5	7.5	1.8	2400
1,1,2-Trichloroethane	343	0	343	0%	0	0	0	0.18	600
1,1-Dichloroethane	343	1	342	0%	120	120	120	0.18	600
1,1-Dichloroethene	343	0	343	0%	0	0	0	0.18	1200
1,1-Dichloropropene	343	0	343	0%	0	0	0	0.18	600
1,2,3-Trichlorobenzene	343	0	343	0%	0	0	0	0.36	1200
1,2,3-Trichloropropane	343	0	343	0%	0	0	0	0.36	1200
1,2,4-Trichlorobenzene	343	0	343	0%	0	0	0	0.36	1200
1,2,4-Trimethylbenzene	343	9	334	3%	2.9	2649.8	11000	0.36	270
1,2-Dibromo-3-chloropropane	343	0	343	0%	0	0	0	0.72	1200
1,2-Dibromoethane	343	0	343	0%	0	0	0	0.18	600
1,2-Dichlorobenzene	343	0	343	0%	0	0	0	0.18	600
1,2-Dichloroethane	343	0	343	0%	0	0	0	0.18	600
1,2-Dichloropropane	343	0	343	0%	0	0	0	0.18	600
1,3,5-Trimethylbenzene	343	9	334	3%	1	1026.9	6000	0.36	270
1,3-Dichlorobenzene	343	0	343	0%	0	0	0	0.18	600
1,3-Dichloropropane	343	0	343	0%	0	0	0	0.18	600
1,4-Dichlorobenzene	343	0	343	0%	0	0	0	0.18	600
2,2-Dichloropropane	343	0	343	0%	0	0	0	0.36	1200
2-Butanone	344	32	312	9%	4.2	19.60	77	2.1	6000
2-Chlorotoluene	343	0	343	0%	0	0	0	0.36	1200
2-Hexanone	343	0	343	0%	0	0	0	1.8	6000
4-Chlorotoluene	343	0	343	0%	0	0	0	0.36	600
4-Isopropyltoluene	343	11	332	3%	0.44	548.4	2100	0.18	270
4-Methyl-2-pentanone	342	1	341	0%	4000	4000	4000	0.9	2400

TABLE 1
SUMMARY STATISTICS OF CHEMICALS IN SOIL SAMPLES[1]
Brisbane Baylands OU-2
Brisbane, California

Analyte	No. of Samples	No. of Detections	No. of Non-Detects	Frequency of Detection	Min Detected Conc.	Mean Detected Conc.	Max Detected Conc.	Minimum Detection Limit[2]	Maximum Detection Limit[2]
Benzene	343	25	318	7%	0.35	115.1	2300	0.18	600
Bromobenzene	343	0	343	0%	0	0	0	0.36	1200
Bromochloromethane	343	0	343	0%	0	0	0	0.36	1200
Bromodichloromethane	343	0	343	0%	0	0	0	0.18	600
Bromoform	343	0	343	0%	0	0	0	0.36	1200
Bromomethane	343	0	343	0%	0	0	0	0.36	1200
Carbon disulfide	343	12	331	3%	1.1	19.27	210	0.36	1500
Carbon tetrachloride	343	0	343	0%	0	0	0	0.18	1200
Chlorobenzene	343	0	343	0%	0	0	0	0.18	600
Chloroethane	343	1	342	0%	260	260	260	0.36	1200
Chloroform	343	1	342	0%	1.4	1.4	1.4	0.18	600
Chloromethane	343	0	343	0%	0	0	0	0.36	1200
cis-1,2-Dichloroethene	343	3	340	1%	0.27	180.34	540	0.18	600
cis-1,3-Dichloropropene	343	0	343	0%	0	0	0	0.18	600
Dibromochloromethane	343	0	343	0%	0	0	0	0.18	600
Dibromomethane	343	0	343	0%	0	0	0	0.18	600
Dichlorodifluoromethane	343	0	343	0%	0	0	0	0.36	1200
Ethylbenzene	343	10	333	3%	0.91	226.30	730	0.18	270
Hexachlorobutadiene	342	0	342	0%	0	0	0	0.36	1200
Isopropylbenzene	343	12	331	3%	0.77	440.0	2300	0.18	270
Methylene Chloride	344	0	344	0%	0	0	0	1.8	6000
Methyl-tert-butyl ether (MTBE)	343	3	340	1%	0.82	1.47	2.4	0.36	1200
Naphthalene	343	16	327	5%	0.87	1105.7	7400	0.36	540
n-Butylbenzene	343	10	333	3%	0.9	730.45	3800	0.36	540
n-Propylbenzene	343	11	332	3%	0.66	468.6	2100	0.18	270
sec-Butylbenzene	343	7	336	2%	67	562.43	1600	0.36	270
Styrene	344	0	344	0%	0	0	0	0.18	600
tert-Butylbenzene	343	1	342	0%	1100	1100	1100	0.36	1200
Tetrachloroethene (PCE)	343	9	334	3%	0.45	3.05	11	0.18	600
Toluene	343	31	312	9%	0.33	204.8	4200	0.18	600
trans-1,2-Dichloroethene	343	0	343	0%	0	0	0	0.18	600
trans-1,3-Dichloropropene	343	0	343	0%	0	0	0	0.18	600
Trichloroethene (TCE)	343	5	338	1%	0.43	21.53	100	0.18	600
Trichlorofluoromethane	342	0	342	0%	0	0	0	0.36	1200
Vinyl Acetate	340	0	340	0%	0	0	0	1.4	3000
Vinyl Chloride	342	1	341	0%	0.81	0.81	0.81	0.36	1200
Xylenes, Total	343	11	332	3%	1.3	1938.8	7600	0.47	540
TPH-Gasoline (C4-C12)	344	51	293	15%	0.058	131.7	2400	0.04	0.14
Polynuclear Aromatic Hydrocarbons (micrograms per kilogram - µg/kg) and Total Petroleum Hydrocarbons as Diesel (milligrams per kilogram - mg/kg)									
2-Methylnaphthalene	330	167	163	51%	4.6	999.9	76,000	3.9	4,700
Acenaphthene	330	81	249	25%	2.7	620.5	25,000	2.6	2,700
Acenaphthylene	330	157	173	48%	2.3	134.7	6,200	2.3	2,300
Anthracene	330	224	106	68%	2	374.7	32,000	1.9	980
Benzo(a)anthracene	330	238	92	72%	1.6	314.9	19,000	1.4	730
Benzo(a)pyrene	329	294	35	89%	1.9	298.4	14,000	1.8	930
Benzo(b)fluoranthene	330	304	26	92%	2.2	317.0	13,000	2	1,000
Benzo(g,h,i)perylene	330	228	102	69%	4.1	157.6	3,900	3.9	8,600

TABLE 1
SUMMARY STATISTICS OF CHEMICALS IN SOIL SAMPLES[1]
Brisbane Baylands OU-2
Brisbane, California

Analyte	No. of Samples	No. of Detections	No. of Non-Detects	Frequency of Detection	Min Detected Conc.	Mean Detected Conc.	Max Detected Conc.	Minimum Detection Limit[2]	Maximum Detection Limit[2]
Benzo(k)fluoranthene	330	249	81	75%	2.1	175.2	10,000	2	2,000
Chrysene	330	287	43	87%	1.4	420.9	31,000	1.3	690
Dibenzo(a,h)anthracene	330	129	201	39%	3.6	52.4	1,100	3.3	7,000
Fluoranthene	330	301	29	91%	1.5	372.9	29,000	1.3	280
Fluorene	330	115	215	35%	2.1	650.7	33,000	2.1	1,100
Indeno(1,2,3-cd)pyrene	330	169	161	51%	4	135.2	3,100	3.9	8,400
Naphthalene	329	201	128	61%	3.5	280.5	13,000	3.3	3,300
Phenanthrene	330	284	46	86%	2.2	890.7	100,000	1.7	880
Pyrene	330	308	22	93%	1.8	804.8	63,000	1.6	170
TPH-Diesel (C10-C28)	330	328	2	99%	0.92	1209.7	94,000	2.5	3
TPH-Diesel (C24-C36)	330	303	27	92%	3.1	1684.8	86,000	2.5	200
Organochlorine Pesticides and Polychlorinated Biphenyls (micrograms per kilogram - µg/kg)									
4,4'-DDD	317	32	285	10%	0.62	8.59	120	0.57	29
4,4'-DDE	317	52	265	16%	0.44	13.03	280	0.39	20
4,4'-DDT	317	48	269	15%	0.88	18.04	220	0.39	8.1
Aldrin	317	0	317	0%	0	0	0	0.47	24
alpha-BHC	317	1	316	0%	1	1	1	0.52	26
alpha-Chlordane	316	20	296	6%	0.57	5.70	61	0.38	19
beta-BHC	316	1	315	0%	2.5	2.5	2.5	0.34	17
Chlordane	317	10	307	3%	9.7	85.6	340	2.7	150
delta-BHC	317	0	317	0%	0	0	0	0.41	21
Dieldrin	317	19	298	6%	0.94	7.39	28	0.55	28
Endosulfan I	317	0	317	0%	0	0	0	0.3	15
Endosulfan II	317	0	317	0%	0	0	0	0.46	24
Endosulfan sulfate	316	0	316	0%	0	0	0	0.36	18
Endrin	317	4	313	1%	2.8	17.7	30	0.43	22
Endrin aldehyde	317	3	314	1%	1.7	3.4	6.6	0.59	30
Endrin ketone	317	1	316	0%	0.7	0.7	0.7	0.31	16
gamma-BHC (Lindane)	317	2	315	1%	4.4	12.2	20	0.59	30
gamma-Chlordane	317	15	302	5%	0.82	6.8	51	0.43	22
Heptachlor	317	0	317	0%	0	0	0	0.43	22
Heptachlor epoxide	317	0	317	0%	0	0	0	0.33	17
Methoxychlor	316	0	316	0%	0	0	0	0.64	33
PCB-1016 (Aroclor 1016)	317	0	317	0%	0	0	0	16	150
PCB-1221 (Aroclor 1221)	317	0	317	0%	0	0	0	16	150
PCB-1232 (Aroclor 1232)	317	0	317	0%	0	0	0	16	150
PCB-1242 (Aroclor 1242)	317	0	317	0%	0	0	0	16	150
PCB-1248 (Aroclor 1248)	317	0	317	0%	0	0	0	16	150
PCB-1254 (Aroclor 1254)	317	7	310	2%	22	206.86	760	16	170
PCB-1260 (Aroclor 1260)	317	60	257	19%	17	276.6	5300	16	150
Toxaphene	317	0	317	0%	0	0	0	6.4	330

Notes and Abbreviations:

[1] All chemicals analyzed from shallow fill zone, including those that were not detected above the laboratory reporting limits, are presented.

[2] Minimum (min) and maximum (max) detection limits at 0 indicates that the analyte was detected in all samples.

No. = number

Conc. = concentration

TABLE 2

SUMMARY STATISTICS OF CHEMICALS IN GROUNDWATER SAMPLES[1]

Brisbane Baylands OU-2

Brisbane, California

Analyte	No. of Samples	No. of Detections	No. of Non-Detects	Frequency of Detection	Min Detected Conc.	Mean Detected Conc.	Max Detected Conc.	Minimum Detection Limit[2]	Maximum Detection Limit[2]
Metals (micrograms per liter - µg/L)									
Antimony	130	21	109	16%	4.3	9.40	50	2.7	4.1
Arsenic	131	112	19	85%	2.9	75.98	4300	2.6	2.9
Barium	131	131	0	100%	15	299.97	2,400	0	0
Beryllium	131	18	113	14%	0.59	0.946	4.7	0.33	0.59
Cadmium	131	33	98	25%	0.21	0.64	4.1	0.21	1.3
Chromium	131	88	43	67%	0.73	6.42	380	0.7	1.5
Chromium, Hexavalent	131	4	127	3%	5.8	25.36	48	3.7	3.7
Cobalt	131	92	39	70%	0.68	9.07	380	0.68	1.2
Copper	131	71	60	54%	3.7	16.52	450	1.5	3.7
Lead	131	67	64	51%	2.7	17.05	320	2.2	2.3
Mercury	131	9	122	7%	0.11	0.18	0.28	0.1	0.1
Molybdenum	131	85	46	65%	2.9	7.186	43	2.3	2.9
Nickel	131	97	34	74%	1.1	13.80	420	0.8	1
Selenium	131	8	123	6%	4.9	7.59	20	4.6	28
Silver	131	5	126	4%	2	2.37	2.8	1.2	4.8
Thallium	100	27	73	27%	3.5	8.19	43	3.5	14
Vanadium	131	61	70	47%	0.88	8.5	280	0.7	0.87
Zinc	131	60	71	46%	7.4	75.8	670	7.4	9.6
Volatile Organic Compounds (VOCs) and Total Petroleum Hydrocarbons as gasoline, diesel, and motor oil (micrograms per liter - µg/L)									
1,1,1,2-Tetrachloroethane	129	0	129	0%	0	0	0	0.067	0.25
1,1,1-Trichloroethane	128	2	126	2%	1.3	9.65	18	0.2	0.25
1,1,2,2-Tetrachloroethane	128	0	128	0%	0	0	0	0.074	0.25
1,1,2-Trichloro-1,2,2-trifluoroethane	128	1	127	1%	1.1	1.1	1.1	0.091	0.5
1,1,2-Trichloroethane	128	0	128	0%	0	0	0	0.11	0.25
1,1-Dichloroethane	129	4	125	3%	0.26	14.69	52	0.11	0.25
1,1-Dichloroethene	130	1	129	1%	0.44	0.44	0.44	0.2	0.25
1,1-Dichloropropene	129	0	129	0%	0	0	0	0.2	0.25
1,2,3-Trichlorobenzene	128	1	127	1%	0.41	0.41	0.41	0.21	0.4
1,2,3-Trichloropropane	128	0	128	0%	0	0	0	0.087	0.4
1,2,4-Trichlorobenzene	128	0	128	0%	0	0	0	0.13	0.4
1,2,4-Trimethylbenzene	128	8	120	6%	0.25	1.7	4.9	0.2	0.25
1,2-Dibromo-3-chloropropane	128	0	128	0%	0	0	0	0.3	0.5
1,2-Dibromoethane	129	0	129	0%	0	0	0	0.075	0.25
1,2-Dichlorobenzene	128	1	127	1%	0.25	0.25	0.25	0.21	0.25
1,2-Dichloroethane	128	0	128	0%	0	0	0	0.077	0.25
1,2-Dichloropropane	128	0	128	0%	0	0	0	0.2	0.25
1,3,5-Trimethylbenzene	129	4	125	3%	0.44	0.9	1.2	0.17	0.25
1,3-Dichlorobenzene	128	0	128	0%	0	0	0	0.2	0.25
1,3-Dichloropropane	129	0	129	0%	0	0	0	0.17	0.25
1,4-Dichlorobenzene	128	0	128	0%	0	0	0	0.16	0.25
2,2-Dichloropropane	128	0	128	0%	0	0	0	0.17	0.4
2-Butanone	128	0	128	0%	0	0.00	0	2.5	8.4
2-Chlorotoluene	128	0	128	0%	0	0	0	0.2	0.25
2-Hexanone	128	0	128	0%	0	0	0	2.5	3
4-Chlorotoluene	128	0	128	0%	0	0	0	0.2	0.25
4-Isopropyltoluene	128	5	123	4%	0.26	1.2	4.5	0.2	0.25
4-Methyl-2-pentanone	128	0	128	0%	0	0	0	2.5	4.5
Acetone	130	19	111	15%	10	19.1	24	10	20

TABLE 2

SUMMARY STATISTICS OF CHEMICALS IN GROUNDWATER SAMPLES[1]

Brisbane Baylands OU-2

Brisbane, California

Analyte	No. of Samples	No. of Detections	No. of Non-Detects	Frequency of Detection	Min Detected Conc.	Mean Detected Conc.	Max Detected Conc.	Minimum Detection Limit[2]	Maximum Detection Limit[2]
Benzene	130	12	118	9%	0.29	3.42	14	0.25	0.25
Bromobenzene	128	0	128	0%	0	0	0	0.2	0.25
Bromochloromethane	128	0	128	0%	0	0	0	0.25	0.25
Bromodichloromethane	128	0	128	0%	0	0	0	0.2	0.25
Bromoform	128	0	128	0%	0	0	0	0.4	0.5
Bromomethane	128	0	128	0%	0	0	0	0.25	0.49
Carbon disulfide	128	0	128	0%	0	0	0	0.5	0.78
Carbon tetrachloride	128	0	128	0%	0	0	0	0.11	0.25
Chlorobenzene	128	0	128	0%	0	0	0	0.13	0.25
Chloroethane	128	3	125	2%	4.5	30.5	77	0.17	0.4
Chloroform	128	0	128	0%	0	0	0	0.25	0.4
Chloromethane	128	0	128	0%	0	0	0	0.19	0.25
cis-1,2-Dichloroethene	129	8	121	6%	0.33	6.63	45	0.076	0.25
cis-1,3-Dichloropropene	128	0	128	0%	0	0	0	0.1	0.25
Dibromochloromethane	128	0	128	0%	0	0	0	0.1	0.25
Dibromomethane	128	0	128	0%	0	0	0	0.25	0.3
Dichlorodifluoromethane	128	0	128	0%	0	0	0	0.25	0.4
Ethylbenzene	129	6	123	5%	0.27	2.70	7.3	0.13	0.25
Hexachlorobutadiene	128	0	128	0%	0	0	0	0.25	0.27
Isopropylbenzene	129	10	119	8%	0.25	0.797	1.6	0.2	0.25
Methylene Chloride	128	0	128	0%	0	0	0	0.88	1.5
Methyl-tert-butyl ether (MTBE)	130	49	81	38%	0.3	3.1	11	0.11	0.25
Naphthalene	130	12	118	9%	0.43	7.9	45	0.22	0.4
n-Butylbenzene	129	5	124	4%	0.48	0.7	1.1	0.3	0.4
n-Propylbenzene	130	10	120	8%	0.25	0.93	1.7	0.2	0.25
sec-Butylbenzene	128	5	123	4%	0.28	0.49	0.68	0.17	0.25
Styrene	128	1	127	1%	0.36	0.36	0.36	0.22	0.25
tert-Butylbenzene	129	0	129	0%	0	0	0	0.2	0.25
Tetrachloroethene (PCE)	129	4	125	3%	0.66	0.8	0.98	0.2	0.25
Toluene	129	20	109	16%	0.26	1.85	15	0.17	0.25
trans-1,2-Dichloroethene	128	1	127	1%	0.6	0.6	0.6	0.13	0.25
trans-1,3-Dichloropropene	128	0	128	0%	0	0	0	0.17	0.25
Trichloroethene (TCE)	129	6	123	5%	0.34	1.42	6.1	0.2	0.25
Trichlorofluoromethane	128	0	128	0%	0	0	0	0.25	0.3
Vinyl Acetate	128	0	128	0%	0	0	0	0.6	2
Vinyl Chloride	129	3	126	2%	0.44	3.8	9.7	0.2	0.25
Xylenes, Total	129	9	120	7%	0.57	5.6	16	0.4	0.5
TPH-Gasoline (C4-C12)	132	25	107	19%	35	353.2	2300	21	50
TPH-Diesel (C10-C28)	134	114	20	85%	99	1733.3	21000	28	110
TPH-Motor Oil (C24-C36)	134	101	33	75%	100	943.5	9900	68	200
Polynuclear Aromatic Hydrocarbons (PAHs) (micrograms per liter - µg/L)									
Acenaphthylene	131	16	115	12%	0.11	0.3	1	0.097	25
Acenaphthene	131	22	109	17%	0.14	1.4	5	0.097	25
Anthracene	131	26	105	20%	0.11	0.5	2	0.097	25
Benzo(a)anthracene	131	25	106	19%	0.1	0.4	1	0.097	25
Benzo(a)pyrene	131	33	98	25%	0.11	0.7	2	0.097	25
Benzo(b)fluoranthene	131	37	94	28%	0.1	0.7	2	0.097	25
Benzo(g,h,i)perylene	131	32	99	24%	0.1	0.6	3	0.097	25
Benzo(k)fluoranthene	131	19	112	15%	0.098	0.3	1	0.097	25

TABLE 2

SUMMARY STATISTICS OF CHEMICALS IN GROUNDWATER SAMPLES[1]

Brisbane Baylands OU-2

Brisbane, California

Analyte	No. of Samples	No. of Detections	No. of Non-Detects	Frequency of Detection	Min Detected Conc.	Mean Detected Conc.	Max Detected Conc.	Minimum Detection Limit[2]	Maximum Detection Limit[2]
Chrysene	131	39	92	30%	0.1	0.6	3	0.098	25
Dibenzo(a,h)anthracene	131	4	127	3%	0.16	0.2	0	0.097	25
Fluoranthene	131	52	79	40%	0.1	0.9	4	0.097	25
Fluorene	131	17	114	13%	0.12	2.1	6	0.097	25
Indeno(1,2,3-cd)pyrene	131	25	106	19%	0.12	0.6	2	0.097	25
Naphthalene	129	32	97	25%	0.11	3.6	41	0.098	3
Phenanthrene	131	53	78	40%	0.11	1.4	10	0.098	25
Pyrene	131	60	71	46%	0.12	1.0	6	0.097	25

Notes and Abbreviations:

[1] All chemicals analyzed from shallow groundwater, including those that were not detected above the laboratory reporting limits, are presented.

[2] Minimum (min) and maximum (max) detection limits at 0 indicates that the analyte was detected in all samples.

No. = number

Conc. = concentration

TABLE 3a
EXPOSURE POINT CONCENTRATIONS IN SOIL 0 - 2 FEET BGS[1,2]
Brisbane Baylands OU-2
Brisbane, California

Analyte	All Areas Except Zone 4 0 - 2 ft bgs 0 - 10 ft bgs (VOCs) [3]	Basis for Exposure Point Concentration	Zone 4 0 - 2 ft bgs 0 - 10 ft bgs (VOCs) [3]	Basis for Exposure Point Concentration
Metals (milligrams per kilogram - mg/kg)				
Antimony	5.8E+01	95% KM (Chebyshev) UCL	3.6E+01	95% KM (Chebyshev) UCL
Arsenic	5.8E+01	95% KM (Chebyshev) UCL	1.3E+01	KM H-UCL
Barium	4.3E+02	95% Chebyshev (Mean, Sd) UCL	8.4E+01	95% H-UCL
Beryllium	2.9E-01	KM H-UCL	2.0E-01	95% KM Approximate Gamma UCL
Cadmium	2.3E+00	KM H-UCL	7.6E-01	KM H-UCL
Chromium	1.3E+02	95% Chebyshev (Mean, Sd) UCL	3.3E+01	95% H-UCL
Cobalt	3.6E+01	95% Student's-t UCL	9.5E+00	95% Approximate Gamma UCL
Copper	2.0E+03	95% Chebyshev (Mean, Sd) UCL	1.6E+02	95% H-UCL
Lead	1.1E+03	95% H-UCL	5.4E+02	95% H-UCL
Mercury	8.1E-01	95% KM (Chebyshev) UCL	5.3E-01	95% KM (Chebyshev) UCL
Molybdenum	5.5E+00	95% KM (Chebyshev) UCL	1.0E+00	KM H-UCL
Nickel	8.5E+01	95% Chebyshev (Mean, Sd) UCL	4.0E+01	95% H-UCL
Selenium	1.3E+00	KM H-UCL	1.3E+00	95% KM (Chebyshev) UCL
Silver	1.1E+00	95% KM (Chebyshev) UCL	3.3E-01	95% KM Approximate Gamma UCL
Thallium	4.1E-01	KM H-UCL	4.4E-01	95% KM (t) UCL
Vanadium	5.8E+02	95% Chebyshev (Mean, Sd) UCL	6.9E+01	95% Approximate Gamma UCL
Zinc	7.2E+02	95% Chebyshev (Mean, Sd) UCL	2.3E+02	95% Chebyshev (Mean, Sd) UCL
Volatile Organic Compounds (VOCs) and Total Petroleum Hydrocarbons as Gasoline (milligrams per kilogram - mg/kg)				
1,1,1-Trichloroethane	--	--	1.2E-01	Maximum
1,1,2-Trichloro1,2,2trifluoroethane	7.5E-03	Maximum	--	--
1,1-Dichloroethane	--	--	1.2E-01	Maximum
1,2,4-Trimethylbenzene	2.4E-01	95% KM Approximate Gamma UCL	1.1E+00	95% KM (Chebyshev) UCL
1,3,5-Trimethylbenzene	1.4E-01	95% KM Approximate Gamma UCL	2.3E-01	95% KM (Chebyshev) UCL
2-Butanone	4.8E-03	95% KM Approximate Gamma UCL	6.3E-03	95% KM (t) UCL
4-Isopropyltoluene	2.6E-02	95% KM (t) UCL	1.1E-01	95% KM (t) UCL
4-Methyl-2pentanone	4.0E+00	Maximum	--	--
Benzene	4.7E-02	95% KM (Chebyshev) UCL	9.2E-03	95% KM (Chebyshev) UCL
Carbon disulfide	4.4E-04	95% KM (t) UCL	2.4E-02	95% KM (Chebyshev) UCL
Chloroethane	--	--	2.6E-01	Maximum
Chloroform	1.4E-03	Maximum	--	--
cis-1,2-Dichloroethene	3.6E-04	95% KM (Chebyshev) UCL	5.4E-01	Maximum
Ethylbenzene	6.1E-03	95% KM (t) UCL	5.3E-02	95% KM (t) UCL
Isopropylbenzene	5.1E-02	95% KM Approximate Gamma UCL	6.9E-02	95% KM (t) UCL
Methyl-tert-butyl ether (MTBE)	3.9E-04	95% KM (t) UCL	--	--
Naphthalene	4.2E-02	95% KM (t) UCL	8.3E-01	95% KM Approximate Gamma UCL
n-Butylbenzene	2.2E-02	95% KM (t) UCL	4.0E-01	95% KM Approximate Gamma UCL
n-Propylbenzene	3.4E-02	95% KM Approximate Gamma UCL	2.1E-01	95% KM Approximate Gamma UCL
sec-Butylbenzene	2.1E-02	95% KM (t) UCL	6.1E-02	95% KM (t) UCL
tert-Butylbenzene	1.1E+00	Maximum	--	--
Tetrachloroethene (PCE)	3.5E-04	95% KM (t) UCL	4.7E-04	95% KM (t) UCL
Toluene	9.1E-02	95% KM (Chebyshev) UCL	6.9E-02	97.5% KM (Chebyshev) UCL
Trichloroethene (TCE)	3.1E-02	95% KM (Chebyshev) UCL	4.8E-01	99% KM (Chebyshev) UCL
Vinyl Chloride	2.4E-04	95% KM (t) UCL	1.0E-01	Maximum
Xylenes, Total	8.1E-04	Maximum	--	--
TPH Gasoline (C4-C12)	8.0E-02	95% KM (t) UCL	4.0E-01	95% KM (t) UCL

TABLE 3a
EXPOSURE POINT CONCENTRATIONS IN SOIL 0 - 2 FEET BGS[1,2]
Brisbane Baylands OU-2
Brisbane, California

Analyte	All Areas Except Zone 4 0 - 2 ft bgs 0 - 10 ft bgs (VOCs) [3]	Basis for Exposure Point Concentration	Zone 4 0 - 2 ft bgs 0 - 10 ft bgs (VOCs) [3]	Basis for Exposure Point Concentration
Polynuclear Aromatic Hydrocarbons and Total Petroleum Hydrocarbons as diesel and motor oil (milligrams per kilogram - mg/kg)				
2-Methylnaphthalene	9.8E-02	KM H-UCL	2.5E-01	95% KM (t) UCL
Acenaphthene	6.7E-02	95% KM (Chebyshev) UCL	3.3E-01	95% KM (t) UCL
Acenaphthylene	6.5E-02	KM H-UCL	8.3E-02	95% KM (t) UCL
Anthracene	1.5E-01	KM H-UCL	6.6E-01	95% KM (Chebyshev) UCL
Benzo(a)anthracene	2.8E-01	KM H-UCL	5.6E-01	KM H-UCL
Benzo(a)pyrene	3.8E-01	KM H-UCL	4.2E-01	Gamma Adjusted KM-UCL
Benzo(b)fluoranthene	5.3E-01	KM H-UCL	4.0E-01	Gamma Adjusted KM-UCL
Benzo(g,h,i)perylene	2.3E-01	KM H-UCL	2.2E-01	Gamma Adjusted KM-UCL
Benzo(k)fluoranthene	1.8E-01	KM H-UCL	3.4E-01	Gamma Adjusted KM-UCL
Chrysene	4.6E-01	KM H-UCL	6.7E-01	95% KM (Chebyshev) UCL
Dibenzo(a,h)anthracene	1.1E-01	95% KM (Chebyshev) UCL	7.3E-02	95% KM (t) UCL
Fluoranthene	5.0E-01	KM H-UCL	4.7E-01	95% KM (Chebyshev) UCL
Fluorene	1.6E-02	KM H-UCL	5.2E-01	95% KM (t) UCL
Indeno(1,2,3-cd)pyrene	1.4E-01	KM H-UCL	1.0E-01	95% KM (t) UCL
Naphthalene	1.1E-01	KM H-UCL	1.0E-01	95% KM (t) UCL
Phenanthrene	3.8E-01	KM H-UCL	2.8E+00	95% KM (Chebyshev) UCL
Pyrene	7.1E-01	KM H-UCL	1.1E+00	Gamma Adjusted KM-UCL
BaP TEQ	5.7E-01	PAH PEFs	5.9E-01	PAH PEFs
TPH-Diesel (C10-C28)	3.7E+02	95% H-UCL	4.0E+03	95% H-UCL
TPH-Motor Oil (C24-C36)	7.8E+02	KM H-UCL	4.2E+03	95% Adjusted Gamma UCL
Organochlorine Pesticides and Polychlorinated Biphenyls (milligrams per kilogram - mg/kg)				
4,4'-DDD	1.7E-03	KM H-UCL	1.4E-03	95% KM (t) UCL
4,4'-DDE	1.7E-02	95% KM (Chebyshev) UCL	1.5E-03	95% KM (t) UCL
4,4'-DDT	6.4E-03	KM H-UCL	2.4E-03	95% KM (t) UCL
alpha-Chlordane	3.8E-03	95% KM (Chebyshev) UCL	1.1E-03	95% KM (t) UCL
Chlordane	1.9E-02	95% KM Approximate Gamma UCL	6.4E-02	Maximum
Dieldrin	2.5E-03	95% KM Approximate Gamma UCL	2.4E-03	Maximum
Endrin	1.7E-03	95% KM (t) UCL	--	--
Endrin aldehyde	1.9E-03	Maximum	--	--
Endrin ketone	--	--	7.0E-04	Maximum
gamma-Chlordane	8.2E-04	KM H-UCL	4.5E-03	Maximum
PCB-1254 (Aroclor 1254)	2.4E-02	95% KM (t) UCL	--	--
PCB-1260 (Aroclor 1260)	9.1E-02	KM H-UCL	2.1E-02	95% KM (t) UCL

Notes and Abbreviations:

[1] Upper confidence limits calculated using U.S. EPA's ProUCL software and based on recommendations from the output files. If more than one recommended UCL was estimated based on the distribution of the dataset, the higher value was selected.

[2] Maximum concentrations were selected if: i) there was an insufficient number of samples in the dataset (typically less than or equal to ten); ii) there was less than two detected samples in the dataset; or iii) the estimated UCL was higher than the maximum detected value.

[3] The data groupings (0 - 2 feet bgs and 0 - 10 feet bgs for VOCs) are explained in the Exposure Assessment of the HRA.

UCL = Upper Confidence Limit

KM = Kaplan-Meier

BCA = Bias Corrected Accelerated

ND = Not detected

BaP TEQ PEFs = benzo(a)pyrene equivalent concentrations using potency equivalency factors (PEFs), DTSC PEA, October 2015

TABLE 3b
EXPOSURE POINT CONCENTRATIONS IN SOIL 0 - 10 FEET BGS[1,2]
Brisbane Baylands OU-2
Brisbane, California

Analyte	All Areas Except Zone 4 0 - 10 ft bgs	Basis for Exposure Point Concentration	Zone 4 0 - 10 ft bgs	Basis for Exposure Point Concentration
Metals (milligrams per kilogram - mg/kg)				
Antimony	3.3E+01	95% KM (Chebyshev) UCL	1.0E+01	95% KM (Chebyshev) UCL
Arsenic	5.3E+01	95% KM (Chebyshev) UCL	5.6E+01	95% KM (Chebyshev) UCL
Barium	3.0E+02	95% Chebyshev (Mean, Sd) UCL	8.1E+02	95% Chebyshev (Mean, Sd) UCL
Beryllium	1.1E-01	95% KM (BCA) UCL	3.4E+00	95% KM (Chebyshev) UCL
Cadmium	1.7E+00	95% KM (Chebyshev) UCL	2.4E+00	KM H-UCL
Chromium	1.2E+02	95% Chebyshev (Mean, Sd) UCL	5.0E+01	95% H-UCL
Cobalt	1.2E+01	95% KM (BCA) UCL	1.2E+02	95% Chebyshev (Mean, Sd) UCL
Copper	1.0E+03	95% Chebyshev (Mean, Sd) UCL	1.9E+03	95% Chebyshev (Mean, Sd) UCL
Lead	1.3E+03	95% KM (Chebyshev) UCL	1.9E+03	KM H-UCL
Mercury	7.0E-01	95% KM (Chebyshev) UCL	4.6E-02	KM H-UCL
Molybdenum	1.7E+00	95% KM (Chebyshev) UCL	8.0E+00	95% KM (Chebyshev) UCL
Nickel	8.1E+01	95% Chebyshev (Mean, Sd) UCL	8.2E+01	95% Chebyshev (Mean, Sd) UCL
Selenium	1.4E+00	95% KM (Chebyshev) UCL	1.6E+00	95% KM (Chebyshev) UCL
Silver	1.4E+00	95% KM Chebyshev UCL	9.3E-01	95% KM (t) UCL
Thallium	6.0E-01	95% KM (Chebyshev) UCL	3.9E-01	95% KM (t) UCL
Vanadium	6.1E+01	95% Chebyshev (Mean, Sd) UCL	1.2E+03	95% Chebyshev (Mean, Sd) UCL
Zinc	8.0E+02	95% Chebyshev (Mean, Sd) UCL	1.2E+03	95% Chebyshev (Mean, Sd) UCL
Volatile Organic Compounds (VOCs) and Total Petroleum Hydrocarbons as Gasoline (milligrams per kilogram - mg/kg)				
1,1,1-Trichloroethane	--	--	1.2E-01	Maximum
1,1,2-Trichloro1,2,2trifluoroethane	7.5E-03	Maximum	--	--
1,1-Dichloroethane	--	--	1.2E-01	Maximum
1,2,4-Trimethylbenzene	2.4E-01	95% KM Approximate Gamma UCL	1.1E+00	95% KM (Chebyshev) UCL
1,3,5-Trimethylbenzene	1.4E-01	95% KM Approximate Gamma UCL	2.3E-01	95% KM (Chebyshev) UCL
2-Butanone	4.8E-03	95% KM Approximate Gamma UCL	6.3E-03	95% KM (t) UCL
4-Isopropyltoluene	2.6E-02	95% KM (t) UCL	1.1E-01	95% KM (t) UCL
4-Methyl-2pentanone	4.0E+00	Maximum	--	--
Benzene	4.7E-02	95% KM (Chebyshev) UCL	9.2E-03	95% KM (Chebyshev) UCL
Carbon disulfide	4.4E-04	95% KM (t) UCL	2.4E-02	95% KM (Chebyshev) UCL
Chloroethane	--	--	2.6E-01	Maximum
Chloroform	1.4E-03	Maximum	--	--
cis-1,2-Dichloroethene	3.6E-04	95% KM (Chebyshev) UCL	5.4E-01	Maximum
Ethylbenzene	6.1E-03	95% KM (t) UCL	5.3E-02	95% KM (t) UCL
Isopropylbenzene	5.1E-02	95% KM Approximate Gamma UCL	6.9E-02	95% KM (t) UCL
Methyl-tert-butyl ether (MTBE)	3.9E-04	95% KM (t) UCL	--	--
Naphthalene	4.2E-02	95% KM (t) UCL	8.3E-01	95% KM Approximate Gamma UCL
n-Butylbenzene	2.2E-02	95% KM (t) UCL	4.0E-01	95% KM Approximate Gamma UCL
n-Propylbenzene	3.4E-02	95% KM Approximate Gamma UCL	2.1E-01	95% KM Approximate Gamma UCL
sec-Butylbenzene	2.1E-02	95% KM (t) UCL	6.1E-02	95% KM (t) UCL
tert-Butylbenzene	1.1E+00	Maximum	--	--
Tetrachloroethene (PCE)	3.5E-04	95% KM (t) UCL	4.7E-04	95% KM (t) UCL
Toluene	9.1E-02	95% KM (Chebyshev) UCL	6.9E-02	97.5% KM (Chebyshev) UCL
Trichloroethene (TCE)	3.1E-02	95% KM (Chebyshev) UCL	4.8E-01	99% KM (Chebyshev) UCL
Vinyl Chloride	2.4E-04	95% KM (t) UCL	1.0E-01	Maximum
Xylenes, Total	8.1E-04	Maximum	--	--
TPH Gasoline (C4-C12)	8.0E-02	95% KM (t) UCL	4.0E-01	95% KM (t) UCL

TABLE 3b
EXPOSURE POINT CONCENTRATIONS IN SOIL 0 - 10 FEET BGS[1,2]
Brisbane Baylands OU-2
Brisbane, California

Analyte	All Areas Except Zone 4 0 - 10 ft bgs	Basis for Exposure Point Concentration	Zone 4 0 - 10 ft bgs	Basis for Exposure Point Concentration
Polynuclear Aromatic Hydrocarbons and Total Petroleum Hydrocarbons as diesel and motor oil (milligrams per kilogram - mg/kg)				
2-Methylnaphthalene	5.8E-01	95% KM (Chebyshev) UCL	7.5E+00	95% KM (Chebyshev) UCL
Acenaphthene	8.9E-02	95% KM (Chebyshev) UCL	2.2E+00	95% KM Approximate Gamma UCL
Acenaphthylene	8.4E-02	95% KM (Chebyshev) UCL	5.5E-01	95% KM Approximate Gamma UCL
Anthracene	2.0E-01	95% KM (Chebyshev) UCL	3.2E+00	95% KM (Chebyshev) UCL
Benzo(a)anthracene	3.9E-01	95% KM (Chebyshev) UCL	1.9E+00	95% KM (Chebyshev) UCL
Benzo(a)pyrene	3.9E-01	95% KM (Chebyshev) UCL	1.4E+00	KM H-UCL
Benzo(b)fluoranthene	2.9E-01	KM H-UCL	1.0E+00	KM H-UCL
Benzo(g,h,i)perylene	2.2E-01	95% KM (Chebyshev) UCL	2.0E-01	95% KM Approximate Gamma UCL
Benzo(k)fluoranthene	2.0E-01	95% KM (Chebyshev) UCL	5.2E-01	KM H-UCL
Chrysene	2.6E-01	KM H-UCL	3.2E+00	95% KM (Chebyshev) UCL
Dibenzo(a,h)anthracene	5.3E-02	95% KM (Chebyshev) UCL	3.2E-02	95% KM (t) UCL
Fluoranthene	3.0E-01	KM H-UCL	9.5E-01	KM H-UCL
Fluorene	1.1E-01	95% KM (Chebyshev) UCL	2.9E+00	95% KM Approximate Gamma UCL
Indeno(1,2,3-cd)pyrene	1.7E-01	95% KM (Chebyshev) UCL	6.7E-02	95% KM Approximate Gamma UCL
Naphthalene	8.2E-02	KM H-UCL	1.3E+00	95% KM Approximate Gamma UCL
Phenanthrene	2.7E-01	KM H-UCL	1.3E+01	97.5% KM (Chebyshev) UCL
Pyrene	4.5E-01	KM H-UCL	6.7E+00	95% KM (Chebyshev) UCL
BaP TEQ		PAH PEFs		PAH PEFs
TPH-Diesel (C10-C28)	4.4E+02	KM H-UCL	1.3E+04	95% Chebyshev (Mean, Sd) UCL
TPH-Motor Oil (C24-C36)	1.2E+03	95% KM (Chebyshev) UCL	1.4E+04	95% KM (Chebyshev) UCL
Organochlorine Pesticides and Polychlorinated Biphenyls (milligrams per kilogram - mg/kg)				
4,4'-DDD	3.8E-03	95% KM (Chebyshev) UCL	9.2E-04	95% KM (t) UCL
4,4'-DDE	8.2E-03	95% KM (Chebyshev) UCL	8.6E-04	95% KM (t) UCL
4,4'-DDT	1.8E-03	KM H-UCL	2.7E-03	95% KM (t) UCL
alpha-Chlordane	1.9E-03	95% KM (Chebyshev) UCL	6.8E-04	95% KM (t) UCL
Chlordane	9.4E-03	95% KM Approximate Gamma UCL	6.4E-02	Maximum
Dieldrin	1.4E-03	95% KM Approximate Gamma UCL	2.4E-03	Maximum
Endrin	1.0E-03	95% KM (t) UCL	0.0E+00	--
Endrin aldehyde	6.7E-04	95% KM (t) UCL	0.0E+00	--
Endrin ketone	0.0E+00	--	0.0E+00	--
gamma-Chlordane	1.7E-03	95% KM (Chebyshev) UCL	7.6E-04	95% KM (t) UCL
PCB-1254 (Aroclor 1254)	2.8E-02	95% KM Approximate Gamma UCL	0.0E+00	--
PCB-1260 (Aroclor 1260)	4.4E-02	KM H-UCL	1.9E-02	95% KM (t) UCL

Notes and Abbreviations:

[1] Upper confidence limits calculated using U.S. EPA's ProUCL software and based on recommendations from the output files. If more than one recommended UCL was estimated based on the distribution of the dataset, the higher value was selected.

[2] Maximum concentrations were selected if: i) there was an insufficient number of samples in the dataset (typically less than or equal to ten); ii) there was less than two detected samples in the dataset; or iii) the estimated UCL was higher than the maximum detected value.

[3] The data groupings (0 - 2 feet bgs and 0 - 10 feet bgs for VOCs) are explained in the Exposure Assessment of the HRA.

UCL = Upper Confidence Limit

KM = Kaplan-Meier

BCA = Bias Corrected Accelerated

ND = Not detected

BaP TEQ PEFs = benzo(a)pyrene equivalent concentrations using potency equivalency factors (PEFs), DTSC PEA, October 2015

TABLE 3c
EXPOSURE POINT CONCENTRATIONS IN SOIL - HVOC PLUME [1]
Brisbane Baylands OU-2
Brisbane, California

Analyte	HVOC Plume 0 - 10 ft bgs[3]	Basis for Exposure Point Concentration
Volatile Organic Compounds (VOCs) (milligrams per kilogram - mg/kg)		
Chloroform	7.7E-03	Maximum
cis-1,2-Dichloroethene	4.9E+02	95% KM (t) UCL
Ethylbenzene	5.3E-03	Maximum
Tetrachloroethene (PCE)	4.8E+03	95% KM (t) UCL
trans-1,2-Dichloroethene	2.5E+02	Maximum
Trichloroethene (TCE)	8.6E+02	Maximum
Vinyl Chloride	2.3E+00	Maximum
Xylenes, Total	3.1E-02	Maximum

Notes and Abbreviations:

[1] Maximum detected concentration.

TABLE 4a
EXPOSURE POINT CONCENTRATIONS IN GROUNDWATER [1,2]
Brisbane Baylands OU-2
Brisbane, California

Analyte	Exposure Point Concentration[3]	Basis for Exposure Point Concentration
Metals		
Antimony	5.8E+00	95% KM (Chebyshev) UCL
Arsenic	2.1E+02	95% KM (Chebyshev) UCL
Barium	4.8E+02	95% Chebyshev (Mean, Sd) UCL
Beryllium	4.8E-01	95% KM (BCA) UCL
Cadmium	3.3E-01	KM H-UCL
Chromium	1.7E+01	95% KM (Chebyshev) UCL
Chromium, Hexavalent	4.9E+00	95% KM (t) UCL
Cobalt	5.7E+00	KM H-UCL
Copper	2.5E+01	95% KM (Chebyshev) UCL
Lead	2.2E+01	95% KM (Chebyshev) UCL
Mercury	1.1E-01	95% KM (t) UCL
Molybdenum	7.6E+00	95% KM (Chebyshev) UCL
Nickel	9.3E+00	KM H-UCL
Selenium	5.0E+00	95% KM (BCA) UCL
Silver	1.3E+00	95% KM (t) UCL
Thallium	6.8E+00	95% KM (Chebyshev) UCL
Vanadium	1.4E+01	95% KM (Chebyshev) UCL
Zinc	7.8E+01	95% KM (Chebyshev) UCL
Volatile Organic Compounds (VOCs) and Total Petroleum Hydrocarbons as Gasoline		
1,1,1-Trichloroethane	1.8E+01	max
1,1,2-Trichloro-1,2,2-trifluoroetha	1.1E+00	max
1,1-Dichloroethane	2.4E+00	95% KM Approximate Gamma UCL
1,1-Dichloroethene	4.4E-01	max
1,2,3-Trichlorobenzene	4.1E-01	max
1,2,4-Trimethylbenzene	3.9E-01	95% KM Approximate Gamma UCL
1,2-Dichlorobenzene	2.5E-01	max
1,3,5-Trimethylbenzene	2.1E-01	95% KM (t) UCL
4-Isopropyltoluene	4.0E-01	95% KM (Chebyshev) UCL
Acetone	1.2E+01	95% KM (t) UCL
Benzene	8.0E-01	95% KM (t) UCL
Chloroethane	7.7E+01	max
cis-1,2-Dichloroethene	2.1E+00	95% KM Approximate Gamma UCL
Ethylbenzene	4.1E-01	95% KM Approximate Gamma UCL
Isopropylbenzene	2.8E-01	95% KM (t) UCL
Methyl-tert-butyl ether (MTBE)	1.6E+00	95% KM Approximate Gamma UCL
Naphthalene	4.4E-01	KM H-UCL
n-Butylbenzene	3.3E-01	95% KM (t) UCL
n-Propylbenzene	3.0E-01	95% KM (t) UCL
sec-Butylbenzene	1.9E-01	95% KM (t) UCL
Styrene	3.6E-01	max
Tetrachloroethene (PCE)	2.4E-01	95% KM (t) UCL
Toluene	8.8E-01	95% KM (Chebyshev) UCL
trans-1,2-Dichloroethene	6.0E-01	max
Trichloroethene (TCE)	2.4E-01	KM H-UCL

TABLE 4a
EXPOSURE POINT CONCENTRATIONS IN GROUNDWATER [1,2]
Brisbane Baylands OU-2
Brisbane, California

Analyte	Exposure Point Concentration[3]	Basis for Exposure Point Concentration
Vinyl Chloride	4.3E-01	95% KM (t) UCL
Xylenes, Total	1.1E+00	95% KM Approximate Gamma UCL
TPH-Gasoline (C4-C12)	6.0E+01	KM H-UCL
Polynuclear Aromatic Hydrocarbons and Total Petroleum Hydrocarbons as diesel and motor oil		
Acenaphthylene	1.4E-01	95% KM (t) UCL
Acenaphthene	5.1E-01	95% KM Approximate Gamma UCL
Anthracene	3.2E-01	95% KM (Chebyshev) UCL
Benzo(a)anthracene	2.0E-01	95% KM Approximate Gamma UCL
Benzo(a)pyrene	2.4E-01	KM H-UCL
Benzo(b)fluoranthene	2.5E-01	KM H-UCL
Benzo(g,h,i)perylene	2.3E-01	KM H-UCL
Benzo(k)fluoranthene	1.5E-01	95% KM (t) UCL
Chrysene	4.2E-01	95% KM (Chebyshev) UCL
Dibenzo(a,h)anthracene	1.1E-01	95% KM (t) UCL
Fluoranthene	4.3E-01	KM H-UCL
Fluorene	5.6E-01	95% KM Approximate Gamma UCL
Indeno(1,2,3-cd)pyrene	1.9E-01	KM H-UCL
Naphthalene	2.6E+00	95% KM (Chebyshev) UCL
Phenanthrene	1.3E+00	95% KM (Chebyshev) UCL
Pyrene	9.3E-01	95% KM (Chebyshev) UCL
TPH-Diesel (C10-C28)	2.6E+03	95% KM (Chebyshev) UCL
TPH-Motor Oil (C24-C36)	1.2E+03	95% KM (Chebyshev) UCL

Notes and Abbreviations:

[1] Upper confidence limits calculated using U.S. EPA's ProUCL software and based on recommendations from the output files. If more than one recommended UCL was estimated based on the distribution of the dataset, the higher value was selected.

[2] Maximum concentrations were selected if: i) there was an insufficient number of samples in the dataset (typically less than or equal to ten); ii) there was less than two detected samples in the dataset; or iii) the estimated UCL was higher than the maximum detected value.

UCL = Upper Confidence Limit

KM = Kaplan-Meier

BCA = Bias Corrected Accelerated

ND = Not detected

TABLE 4b
EXPOSURE POINT CONCENTRATIONS IN GROUNDWATER - HVOC PLUME[1]
Brisbane Baylands OU-2
Brisbane, California

Analyte	Exposure Point Concentration[3]	Basis for Exposure Point Concentration
Volatile Organic Compounds (VOCs)		
x cis-1,2-Dichloroethene	1.9E+05	Maximum
x Ethylbenzene	1.7E+01	Maximum
x Tetrachloroethene (PCE)	4.3E+04	Maximum
x Toluene	2.7E+00	Maximum
x trans-1,2-Dichloroethene	3.7E+03	Maximum
x Trichloroethene (TCE)	1.3E+04	Maximum
x Vinyl Chloride	6.5E+04	Maximum
x Xylenes, Total	1.5E+01	Maximum

Notes and Abbreviations:

[1] Maximum concentrations were selected if: i) there was an insufficient number of samples in the dataset (typically less than or equal to ten); ii) there was less than two detected samples in the dataset; or iii) the estimated UCL was higher than the maximum detected value.

TABLE 4c
ESTIMATED EXPOSURE POINT CONCENTRATIONS IN SOIL VAPOR[1]
FROM GROUNDWATER[2]
Brisbane Baylands OU-2
Brisbane, California

Analyte	Exposure Point Concentration Sitewide Groundwater µg/L	Exposure Point Concentration HVOC Plume µg/L	Dimensionless Henry's Constant	Soil Vapor Exposure Point Concentration Sitewide $\mu g/m^3$	Soil Vapor Exposure Point Concentration HVOC Plume $\mu g/m^3$
Volatile Organic Compounds (VOCs) and Total Petroleum Hydrocarbons as Gasoline					
1,1,1-Trichloroethane	1.8E+01	NA	7.0E-01	1.3E+04	NA
1,1,2-Trichloro-1,2,2-trifluoroethane	1.1E+00	NA	2.2E+01	2.4E+04	NA
1,1-Dichloroethane	2.4E+00	NA	2.3E-01	5.5E+02	NA
1,1-Dichloroethene	4.4E-01	NA	1.1E+00	4.8E+02	NA
1,2,3-Trichlorobenzene	4.1E-01	NA	5.1E-02	2.1E+01	NA
1,2,4-Trimethylbenzene	3.9E-01	NA	2.5E-01	9.8E+01	NA
1,2-Dichlorobenzene	2.5E-01	NA	7.8E-02	2.0E+01	NA
1,3,5-Trimethylbenzene	2.1E-01	NA	3.6E-01	7.7E+01	NA
4-Isopropyltoluene	4.0E-01	NA	2.7E-01	1.1E+02	NA
Acetone	1.2E+01	NA	1.4E-03	1.7E+01	NA
Benzene	8.0E-01	NA	2.3E-01	1.8E+02	NA
Chloroethane	7.7E+01	NA	4.5E-01	3.5E+04	NA
cis-1,2-Dichloroethene	2.1E+00	1.9E+05	1.7E-01	3.5E+02	3.2E+07
Ethylbenzene	4.1E-01	1.7E+01	3.2E-01	1.3E+02	5.5E+03
Isopropylbenzene	2.8E-01	NA	4.7E-01	1.3E+02	NA
Methyl-tert-butyl ether (MTBE)	1.6E+00	NA	2.4E-02	3.9E+01	NA
Naphthalene	4.4E-01	NA	1.8E-02	7.9E+00	NA
n-Butylbenzene	3.3E-01	NA	6.5E-01	2.1E+02	NA
n-Propylbenzene	3.0E-01	NA	4.3E-01	1.3E+02	NA
sec-Butylbenzene	1.9E-01	NA	7.2E-01	1.4E+02	NA
Styrene	3.6E-01	NA	1.1E-01	4.0E+01	NA
Tetrachloroethene (PCE)	2.4E-01	4.3E+04	7.2E-01	1.7E+02	3.1E+07
Toluene	8.8E-01	2.7E+00	2.7E-01	2.4E+02	7.2E+02
trans-1,2-Dichloroethene	6.0E-01	3.7E+03	3.8E-01	2.3E+02	1.4E+06
Trichloroethene (TCE)	2.4E-01	1.3E+04	4.0E-01	9.7E+01	5.2E+06
Vinyl Chloride	4.3E-01	6.5E+04	1.1E+00	4.8E+02	7.1E+07
Xylenes, Total	1.1E+00	NA	2.7E-01	3.0E+02	NA
TPH-Gasoline (C4-C12)	6.0E+01	1.5E+01	7.3E+01	4.4E+06	1.1E+06

Notes and Abbreviations:

[1] Soil vapor concentration ($\mu g/m^3$) = Groundwater concentration (µg/L) * Dimensionless Henry's Law Constant * Conversion Factor (1000 L/m^3)

[2] Groundwater concentration ($\mu g/m^3$) presented in Tables 4a and 4b

NA = Not Available

TABLE 5
TOXICITY CRITERIA OF COPCs
Brisbane Baylands OU-2
Brisbane, California

Analyte	Cancer Toxicity Criteria				Noncancer Toxicity Criteria			
	Oral Slope Factor CSFo $(mg/kg\text{-}d)^{-1}$	Ref	Inhalation Unit Risk Factor IUR $(\mu g/m^3)^{-1}$	Ref	Oral Reference Dose RfDo mg/kg-d	Ref	Reference Concentration RfC $\mu g/m^3$	Ref
Metals								
Antimony	NC		NC		1.4E-04	o	NA	
Arsenic	9.5E+00	c	4.3E-03	i	3.5E-06	c	1.5E-02	c
Barium	NC		NC		2.0E-01	i	5.0E-01	e
Beryllium	NC		2.4E-03	i	2.0E-04	c	7.0E-03	c
Cadmium	NC		4.2E-03	o	1.0E-03	i	1.0E-02	c
Chromium	NC		NC		1.5E+00	i	NA	
Cobalt	NC		9.0E-03	e	3.0E-04	e	6.0E-03	e
Copper	NC		NC		4.0E-02	e	NA	
Lead	8.5E-03	wb	1.2E-05	wb	NA		NA	
Mercury	NC		NC		1.6E-04	c	3.0E-02	c
Molybdenum	NC		NC		5.0E-03	i	NA	
Nickel	NC		2.6E-04	c	1.1E-02	c	1.4E-02	c
Selenium	NC		NC		5.0E-03	i	2.0E+01	c
Silver	NC		NC		5.0E-03	i	NA	
Thallium	NC		NC		1.0E-05	e	NA	
Vanadium	NC		NC		5.0E-03	e	1.0E-01	c
Zinc	NC		NC		3.0E-01	i	NA	
Volatile Organic Compounds (VOCs) and Total Petroleum Hydrocarbons as Gasoline								
1,1,1-Trichloroethane	NC		NC		2.0E+00	i	1.0E+03	c
Freon 113	NC		NC		3.0E+01	i	5.0E+03	e
1,1-Dichloroethane	5.7E-03	c	1.6E-06	c	2.0E-01	c	8.0E+02	c
1,2,4-Trimethylbenzene	NC		NC		1.0E-02	i	6.0E+01	i
1,3,5-Trimethylbenzene	NC		NC		1.0E-02	i	6.0E+01	i
2-Butanone	NC		NC		6.0E-01	i	5.0E+03	i
4-Isopropyltoluene	NC		NC		8.0E-02	i	3.0E+02	c
4-Methyl-2-Pentanone	NC		NC		NA		3.0E+03	i
Benzene	1.0E-01	c	2.9E-05	c	4.0E-03	i	3.0E+00	c
Carbon disulfide	NC		NC		1.0E-01	i	7.0E+02	i
Chloroethane	NC		NC		NA		1.0E+03	i
Chloroform	3.1E-02	c	2.3E-05	i	1.0E-02	i	9.8E+01	e
cis-1,2-Dichloroethene	NC		NC		2.0E-03	i	8.0E+00	i
Ethylbenzene	1.1E-02	c	2.5E-06	c	1.0E-01	i	1.0E+03	i
Isopropylbenzene	NC		NC		1.0E-01	i	4.0E+02	i
Methyl-tert-butyl ether	0.0018	c	2.60E-07	c	NA		0.003	i
Naphthalene	NC		3.4E-05	c	2.0E-02	i	3.0E+00	i
n-Butylbenzene	NC		NC		5.0E-02	e	2.0E+02	rtr
n-Propylbenzene	NC		NC		1.0E-01	e	1.0E+03	e
sec-Butylbenzene	NC		NC		1.0E-01	e	4.0E+02	rtr
tert-Butylbenzene	NC		NC		1.0E-01	e	4.0E+02	rtr
Tetrachloroethene (PCE)	5.4E-01	c	6.1E-06	c	6.0E-03	i	4.0E+01	i
Toluene	NC		NC		8.0E-02	i	3.0E+02	c
Trichloroethene (TCE)	4.6E-02	i	4.1E-06	i	5.0E-04	i	2.0E+00	i
Vinyl Chloride	7.2E-01	i	7.8E-05	c	3.0E-03	i	1.0E+02	i
Xylenes, Total	NC		NC		2.0E-01	i	1.0E+02	i
TPH-g (C4-C12)	NC		NC		3.9E-02	wb	5.7E+02	wb
Polynuclear Aromatic Hydrocarbons and Total Petroleum Hydrocarbons as Diesel								

TABLE 5
TOXICITY CRITERIA OF COPCs
Brisbane Baylands OU-2
Brisbane, California

Analyte	Cancer Toxicity Criteria				Noncancer Toxicity Criteria			
	Oral Slope Factor CSFo $(mg/kg\text{-}d)^{-1}$	Ref	Inhalation Unit Risk Factor IUR $(\mu g/m^3)^{-1}$	Ref	Oral Reference Dose RfDo mg/kg-d	Ref	Reference Concentration RfC $\mu g/m^3$	Ref
2-Methylnaphthalene	NC		NC		4.0E-03	i	NA	
Acenaphthene	NC		NC		6.0E-02	i	NA	
Acenaphthylene	NC		NC		NA		NA	
Anthracene	NC		NC		3.0E-01	i	NA	
Benzo(a)anthracene	1.0E-01	e	1.1E-04	c	NA		NA	
Benzo(a)pyrene	1.0E+00	i	1.1E-03	c	3.0E-04	i	2.0E-03	i
Benzo(b)fluoranthene	1.0E-01	e	1.1E-04	c	NA		NA	
Benzo(g,h,i)perylene	NC		NC		NA		NA	
Benzo(k)fluoranthene	1.0E-02	e	1.1E-04	c	NA		NA	
Chrysene	1.0E-03	e	1.1E-05	c	NA		NA	
Dibenzo(a,h)anthracene	1.0E+00	e	1.2E-03	c	NA		NA	
Fluoranthene	NC		NC		4.0E-02	i	NA	
Fluorene	NC		NC		4.0E-02	i	NA	
Indeno(1,2,3-cd)pyrene	1.0E-01	e	1.1E-04	c	--	--	--	--
Naphthalene	NC		3.4E-05	c	2.0E-02	i	3.0E+00	i
Phenanthrene	NC		NC		NA		NA	
Pyrene	NC		NC		3.0E-02	i	NA	
TPH-Diesel (C10-C28)	NC		NC		1.9E-02	wb	2.6E+02	wb
TPH-Motor Oil	NC		NC		1.5E-01	wb	NA	
Organochlorine Pesticides and Polychlorinated Biphenyls								
4,4'-DDD	2.4E-01	i	6.9E-05	c	3.0E-05	e	NA	
4,4'-DDE	3.4E-01	i	9.7E-05	c	3.0E-04	e	NA	
4,4'-DDT	3.4E-01	i	9.7E-05	i	5.0E-04	i	NA	
alpha-Chlordane	1.3E+00	c	3.4E-04	c	5.0E-04	i	7.0E-01	i
Chlordane	1.3E+00	c	3.4E-04	c	5.0E-04	i	7.0E-01	i
Dieldrin	1.6E+01	i	4.6E-03	i	5.0E-05	i	NA	
Endrin	NC		NC		3.0E-04	I	NA	
Endrin aldehyde	NC		NC		3.0E-04	I	NA	
Endrin ketone	NC		NC		3.0E-04	I	NA	
gamma-Chlordane	1.3E+00	c	3.4E-04	c	5.0E-04	i	7.0E-01	i
PCB-1254 (Aroclor 1254)	2.0E+00	e	5.7E-04	e	2.0E-05	i	NA	
PCB-1260 (Aroclor 1260)	2.0E+00	e	5.7E-04	e	NA		NA	

Notes and Abbreviations:
COPCs = chemicals of potential concern
Ref = Reference
c = cal epa oehha
e = US EPA RSLs
i = IRIS
NC = Noncarcinogen
NA = Not Available
rtr = route-to-route
wb = Water Board ESLs, 2019

TABLE 6
SUMMARY OF EXCESS LIFETIME CANCER RISK AND NONCANCER HAZARD
CHEMICALS IN SOIL ALL AREAS EXCEPT FOR ZONE 4 - FUTURE WORKER
Brisbane Baylands OU-2
Brisbane, California

Analyte	Exposure Point Concentration mg/kg	Screening Level Cancer mg/kg	Screening Level Noncancer mg/kg	Excess Cancer Risk	Noncancer Hazard Index	Percent Contribution Cancer	Percent Contribution Noncancer
Metals							
Antimony	5.8E+01	NC	1.60E+02	NC	3.7E-01	--	2%
Arsenic	5.8E+01	3.10E-01	3.60E+00	1.9E-04	1.6E+01	98%	94%
Barium	4.3E+02	NC	2.20E+05	NC	2.0E-03	--	0%
Beryllium	2.9E-01	6.90E+03	2.30E+02	4.1E-11	1.2E-03	0%	0%
Cadmium	2.3E+00	4.00E+03	1.10E+03	5.8E-10	2.1E-03	0%	0%
Chromium	1.3E+02	NC	1.80E+06	NC	7.3E-05	--	0%
Cobalt	3.6E+01	1.90E+03	3.50E+02	1.9E-08	1.0E-01	0%	1%
Copper	2.0E+03	NC	4.70E+04	NC	4.2E-02	--	0%
Lead	1.1E+03	3.80E+02	3.20E+02	2.9E-06	NA	2%	--
Mercury	8.1E-01	NC	1.90E+02	NC	4.2E-03	--	0%
Molybdenum	5.5E+00	NC	5.80E+03	NC	9.4E-04	--	0%
Nickel	8.5E+01	6.40E+04	1.10E+04	1.3E-09	7.7E-03	0%	0%
Selenium	1.3E+00	NC	5.80E+03	NC	2.3E-04	--	0%
Silver	1.1E+00	NC	5.80E+03	NC	1.9E-04	--	0%
Thallium	4.1E-01	NC	1.20E+01	NC	3.4E-02	--	0%
Vanadium	5.8E+02	NC	5.80E+03	NC	9.9E-02	--	1%
Zinc	7.2E+02	NC	3.50E+05	NC	2.1E-03	--	0%
Volatile Organic Compounds (VOCs) and Total Petroleum Hydrocarbons as Gasoline							
1,1,1-Trichloroethane	0.0E+00	NC	7.30E+03	NC	0.0E+00	--	0%
1,1,2-Trichloro1,2,2trifluoroethane	7.5E-03	NC	1.80E+04	NC	4.2E-07	--	0%
1,1-Dichloroethane	0.0E+00	1.60E+01	2.30E+05	0.0E+00	0.0E+00	0%	0%
1,2,4-Trimethylbenzene	2.4E-01	NC	1.80E+03	NC	1.4E-04	--	0%
1,3,5-Trimethylbenzene	1.4E-01	NC	1.50E+03	NC	9.0E-05	--	0%
2-Butanone	4.8E-03	NC	1.90E+05	NC	2.5E-08	--	0%
4-Isopropyltoluene	2.6E-02	NC	5.30E+03	NC	5.0E-06	--	0%
4-Methyl-2pentanone	4.0E+00	NC	1.40E+05	NC	2.9E-05	--	0%
Benzene	4.7E-02	1.40E+00	4.70E+01	3.4E-08	1.0E-03	0%	0%
Carbon disulfide	4.4E-04	NC	3.50E+03	NC	1.3E-07	--	0%
Chloroethane	0.0E+00	NC	5.90E+04	NC	0.0E+00	--	0%
Chloroform	1.4E-03	1.40E+00	1.00E+03	1.0E-09	1.4E-06	0%	0%
cis-1,2-Dichloroethene	3.6E-04	NC	8.50E+01	NC	4.3E-06	--	0%
Ethylbenzene	6.1E-03	2.60E+01	2.10E+04	2.3E-10	2.9E-07	0%	0%
Isopropylbenzene	5.1E-02	NC	9.90E+03	NC	5.2E-06	--	0%
Methyl-tert-butyl ether (MTBE)	3.9E-04	2.10E+02	6.60E+04	1.9E-12	5.9E-09	0%	0%
Naphthalene	4.2E-02	1.70E+01	5.80E+02	2.5E-09	7.3E-05	0%	0%
n-Butylbenzene	2.2E-02	NC	5.80E+04	NC	3.7E-07	--	0%
n-Propylbenzene	3.4E-02	NC	2.40E+04	NC	1.4E-06	--	0%
sec-Butylbenzene	2.1E-02	NC	1.20E+05	NC	1.7E-07	--	0%
tert-Butylbenzene	1.1E+00	NC	1.20E+05	NC	9.2E-06	--	0%
Tetrachloroethene (PCE)	3.5E-04	2.70E+00	3.90E+02	1.3E-10	8.9E-07	0%	0%
Toluene	9.1E-02	NC	5.30E+03	NC	1.7E-05	--	0%
Trichloroethene (TCE)	3.1E-02	6.10E+00	1.90E+01	5.1E-09	1.6E-03	0%	0%
Vinyl Chloride	2.4E-04	1.50E-01	3.80E+02	1.6E-09	6.2E-07	0%	0%
Xylenes, Total	8.1E-04	NC	2.50E+03	NC	3.2E-07	--	0%
TPH Gasoline (C4-C12)	8.0E-02	NC	2.00E+03	NC	4.0E-05	--	0%

TABLE 6
SUMMARY OF EXCESS LIFETIME CANCER RISK AND NONCANCER HAZARD
CHEMICALS IN SOIL ALL AREAS EXCEPT FOR ZONE 4 - FUTURE WORKER
Brisbane Baylands OU-2
Brisbane, California

Analyte	Exposure Point Concentration mg/kg	Screening Level Cancer mg/kg	Screening Level Noncancer mg/kg	Excess Cancer Risk	Noncancer Hazard Index	Percent Contribution Cancer	Percent Contribution Noncancer
Polynuclear Aromatic Hydrocarbons and Total Petroleum Hydrocarbons as Diesel							
2-Methylnaphthalene	9.8E-02	NC	3.00E+03	NC	3.3E-05	--	0%
Acenaphthene	6.7E-02	NC	4.50E+04	NC	1.5E-06	--	0%
Acenaphthylene	6.5E-02	NC	4.50E+04	NC	1.5E-06	--	0%
Anthracene	1.5E-01	NC	2.30E+05	NC	6.7E-07	--	0%
Benzo(a)anthracene	2.8E-01	2.00E+01	NA	1.4E-08	NA	0%	--
Benzo(a)pyrene	3.8E-01	2.10E+00	2.20E+02	1.8E-07	1.7E-03	0%	0%
Benzo(b)fluoranthene	5.3E-01	2.10E+01	NA	2.5E-08	NA	0%	--
Benzo(g,h,i)perylene	2.3E-01	NC	NA	NC	NA	--	--
Benzo(k)fluoranthene	1.8E-01	2.10E+02	NA	8.8E-10	NA	0%	--
Chrysene	4.6E-01	2.10E+03	NA	2.2E-10	NA	0%	--
Dibenzo(a,h)anthracene	1.1E-01	2.10E+00	NA	5.1E-08	NA	0%	--
Fluoranthene	5.0E-01	NC	3.00E+04	NC	1.7E-05	--	0%
Fluorene	1.6E-02	NC	3.00E+04	NC	5.4E-07	--	0%
Indeno(1,2,3-cd)pyrene	1.4E-01	2.10E+01	NA	6.6E-09	NA	0%	--
Naphthalene	1.1E-01	1.70E+01	5.80E+02	6.4E-09	1.9E-04	0%	0%
Phenanthrene	3.8E-01	NC	NA	NC	NA	--	--
Pyrene	7.1E-01	NC	2.30E+04	NC	3.1E-05	--	0%
B(a)P TEQ	6.1E-01	2.10E+00	2.20E+02	2.9E-07	2.8E-03	0%	0%
TPH-Diesel (C10-C28)	3.7E+02	NC	1.20E+03	NC	3.1E-01	--	2%
TPH-Motor Oil (C24-C36)	7.8E+02	NC	1.80E+05	NC	4.3E-03	--	0%
Organochlorine Pesticides and Polychlorinated Biphenyls							
4,4'-DDD	1.7E-03	1.20E+01	NA	1.4E-10	NA	0%	--
4,4'-DDE	1.7E-02	8.30E+00	NA	2.1E-09	NA	0%	--
4,4'-DDT	6.4E-03	8.50E+00	5.20E+02	7.5E-10	1.2E-05	0%	0%
alpha-Chlordane	3.8E-03	2.20E+00	5.00E+02	1.7E-09	7.6E-06	0%	0%
Chlordane	1.9E-02	2.20E+00	5.00E+02	8.7E-09	3.8E-05	0%	0%
Dieldrin	2.5E-03	1.60E-01	4.80E+01	1.6E-08	5.2E-05	0%	0%
Endrin	1.7E-03	NC	2.90E+02	NC	6.0E-06	--	0%
Endrin aldehyde	0.0E+00	NC	2.90E+02	NC	0.0E+00	--	0%
Endrin ketone	0.0E+00	NC	2.90E+02	NC	0.0E+00	--	0%
gamma-Chlordane	8.2E-04	2.20E+00	5.00E+02	3.7E-10	1.6E-06	0%	0%
PCB-1254 (Aroclor 1254)	2.4E-02	9.40E-01	NA	2.6E-08	NA	0%	--
PCB-1260 (Aroclor 1260)	9.1E-02	9.40E-01	NA	9.7E-08	NA	0%	--
TOTAL				**2E-04**	**1.7E+01**		
TOTAL without Arsenic				**4E-06**	**9.9E-01**		
TOTAL without B(a)P TEQ				**2E-04**	**1.7E+01**		

Notes and Abbreviations:

[1] Screening levels based first on SF RWQCB Environmental Screening Levels, January 2019 and supplemented by U.S. EPA Regional Screening Levels May 2019).

NC = Noncarcinogen NA = Not Available

TABLE 7
SUMMARY OF EXCESS LIFETIME CANCER RISK AND NONCANCER HAZARD
CHEMICALS IN SOIL ZONE 4 - FUTURE WORKER
Brisbane Baylands OU-2
Brisbane, California

Analyte	Exposure Point Concentration mg/kg	Screening Level Cancer mg/kg	Screening Level Noncancer mg/kg	Excess Cancer Risk	Noncancer Hazard Index	Percent Contribution Cancer	Percent Contribution Noncancer
Metals							
Antimony	3.6E+01	NC	1.60E+02	NC	2.3E-01	--	3%
Arsenic	1.3E+01	3.10E-01	3.60E+00	4.1E-05	3.5E+00	93%	48%
Barium	8.4E+01	NC	2.20E+05	NC	3.8E-04	--	0%
Beryllium	2.0E-01	6.90E+03	2.30E+02	2.9E-11	8.6E-04	0%	0%
Cadmium	7.6E-01	4.00E+03	1.10E+03	1.9E-10	6.9E-04	0%	0%
Chromium	3.3E+01	NC	1.80E+06	NC	1.8E-05	--	0%
Cobalt	9.5E+00	1.90E+03	3.50E+02	5.0E-09	2.7E-02	0%	0%
Copper	1.6E+02	NC	4.70E+04	NC	3.5E-03	--	0%
Lead	5.4E+02	3.80E+02	3.20E+02	1.4E-06	NA	3%	--
Mercury	5.3E-01	NC	1.90E+02	NC	2.8E-03	--	0%
Molybdenum	1.0E+00	NC	5.80E+03	NC	1.8E-04	--	0%
Nickel	4.0E+01	6.40E+04	1.10E+04	6.2E-10	3.6E-03	0%	0%
Selenium	1.3E+00	NC	5.80E+03	NC	2.2E-04	--	0%
Silver	3.3E-01	NC	5.80E+03	NC	5.6E-05	--	0%
Thallium	4.4E-01	NC	1.20E+01	NC	3.7E-02	--	1%
Vanadium	6.9E+01	NC	5.80E+03	NC	1.2E-02	--	0%
Zinc	2.3E+02	NC	3.50E+05	NC	6.7E-04	--	0%
Volatile Organic Compounds (VOCs) and Total Petroleum Hydrocarbons as Gasoline							
1,1,1-Trichloroethane	1.2E-01	NC	7.30E+03	NC	1.6E-05	--	0%
1,1,2-Trichloro1,2,2trifluoroethane	0.0E+00	NC	1.80E+04	NC	0.0E+00	--	0%
1,1-Dichloroethane	1.2E-01	1.60E+01	2.30E+05	7.5E-09	5.2E-07	0%	0%
1,2,4-Trimethylbenzene	1.1E+00	NC	1.80E+03	NC	5.9E-04	--	0%
1,3,5-Trimethylbenzene	2.3E-01	NC	1.50E+03	NC	1.5E-04	--	0%
2-Butanone	6.3E-03	NC	1.90E+05	NC	3.3E-08	--	0%
4-Isopropyltoluene	1.1E-01	NC	5.30E+03	NC	2.2E-05	--	0%
4-Methyl-2pentanone	0.0E+00	NC	1.40E+05	NC	0.0E+00	--	0%
Benzene	9.2E-03	1.40E+00	4.70E+01	6.6E-09	2.0E-04	0%	0%
Carbon disulfide	2.4E-02	NC	3.50E+03	NC	6.8E-06	--	0%
Chloroethane	2.6E-01	NC	5.90E+04	NC	4.4E-06	--	0%
Chloroform	0.0E+00	1.40E+00	1.00E+03	0.0E+00	0.0E+00	0%	0%
cis-1,2-Dichloroethene	5.4E-01	NC	8.50E+01	NC	6.4E-03	--	0%
Ethylbenzene	5.3E-02	2.60E+01	2.10E+04	2.0E-09	2.5E-06	0%	0%
Isopropylbenzene	6.9E-02	NC	9.90E+03	NC	7.0E-06	--	0%
Methyl-tert-butyl ether (MTBE)	0.0E+00	2.10E+02	6.60E+04	0.0E+00	0.0E+00	0%	0%
Naphthalene	8.3E-01	1.70E+01	5.80E+02	4.9E-08	1.4E-03	0%	0%
n-Butylbenzene	4.0E-01	NC	5.80E+04	NC	6.9E-06	--	0%
n-Propylbenzene	2.1E-01	NC	2.40E+04	NC	8.9E-06	--	0%
sec-Butylbenzene	6.1E-02	NC	1.20E+05	NC	5.1E-07	--	0%
tert-Butylbenzene	0.0E+00	NC	1.20E+05	NC	0.0E+00	--	0%
Tetrachloroethene (PCE)	4.7E-04	2.70E+00	3.90E+02	1.7E-10	1.2E-06	0%	0%
Toluene	6.9E-02	NC	5.30E+03	NC	1.3E-05	--	0%
Trichloroethene (TCE)	4.8E-01	6.10E+00	1.90E+01	7.9E-08	2.5E-02	0%	0%
Vinyl Chloride	1.0E-01	1.50E-01	3.80E+02	6.7E-07	2.6E-04	2%	0%
Xylenes, Total	0.0E+00	NC	2.50E+03	NC	0.0E+00	--	0%
TPH Gasoline (C4-C12)	4.0E-01	NC	2.00E+03	NC	2.0E-04	--	0%

TABLE 7
SUMMARY OF EXCESS LIFETIME CANCER RISK AND NONCANCER HAZARD
CHEMICALS IN SOIL ZONE 4 - FUTURE WORKER
Brisbane Baylands OU-2
Brisbane, California

Analyte	Exposure Point Concentration mg/kg	Screening Level Cancer mg/kg	Screening Level Noncancer mg/kg	Excess Cancer Risk	Noncancer Hazard Index	Percent Contribution Cancer	Percent Contribution Noncancer
Polynuclear Aromatic Hydrocarbons and Total Petroleum Hydrocarbons as Diesel							
2-Methylnaphthalene	2.5E-01	NC	3.00E+03	NC	8.4E-05	--	0%
Acenaphthene	3.3E-01	NC	4.50E+04	NC	7.3E-06	--	0%
Acenaphthylene	8.3E-02	NC	4.50E+04	NC	1.8E-06	--	0%
Anthracene	6.6E-01	NC	2.30E+05	NC	2.9E-06	--	0%
Benzo(a)anthracene	5.6E-01	2.00E+01	NA	2.8E-08	NA	0%	--
Benzo(a)pyrene	4.2E-01	2.10E+00	2.20E+02	2.0E-07	1.9E-03	0%	0%
Benzo(b)fluoranthene	4.0E-01	2.10E+01	NA	1.9E-08	NA	0%	--
Benzo(g,h,i)perylene	2.2E-01	NC	NA	NC	NA	--	--
Benzo(k)fluoranthene	3.4E-01	2.10E+02	NA	1.6E-09	NA	0%	--
Chrysene	6.7E-01	2.10E+03	NA	3.2E-10	NA	0%	--
Dibenzo(a,h)anthracene	7.3E-02	2.10E+00	NA	3.5E-08	NA	0%	--
Fluoranthene	4.7E-01	NC	3.00E+04	NC	1.6E-05	--	0%
Fluorene	5.2E-01	NC	3.00E+04	NC	1.7E-05	--	0%
Indeno(1,2,3-cd)pyrene	1.0E-01	2.10E+01	NA	4.9E-09	NA	0%	--
Naphthalene	1.0E-01	1.70E+01	5.80E+02	6.0E-09	1.8E-04	0%	0%
Phenanthrene	2.8E+00	NC	NA	NC	NA	--	--
Pyrene	1.1E+00	NC	2.30E+04	NC	4.7E-05	--	0%
B(a)P TEQ	6.0E-01	2.10E+00	2.20E+02	2.9E-07	2.7E-03	1%	0%
TPH-Diesel (C10-C28)	4.0E+03	NC	1.20E+03	NC	3.4E+00	--	46%
TPH-Motor Oil (C24-C36)	4.2E+03	NC	1.80E+05	NC	2.4E-02	--	0%
Organochlorine Pesticides and Polychlorinated Biphenyls							
4,4'-DDD	1.4E-03	1.20E+01	NA	1.2E-10	NA	0%	--
4,4'-DDE	1.5E-03	8.30E+00	NA	1.8E-10	NA	0%	--
4,4'-DDT	2.4E-03	8.50E+00	5.20E+02	2.8E-10	4.6E-06	0%	0%
alpha-Chlordane	1.1E-03	2.20E+00	5.00E+02	4.8E-10	2.1E-06	0%	0%
Chlordane	6.4E-02	2.20E+00	5.00E+02	2.9E-08	1.3E-04	0%	0%
Dieldrin	2.4E-03	1.60E-01	4.80E+01	1.5E-08	5.0E-05	0%	0%
Endrin	0.0E+00	NC	2.90E+02	NC	0.0E+00	--	0%
Endrin aldehyde	0.0E+00	NC	2.90E+02	NC	0.0E+00	--	0%
Endrin ketone	7.0E-04	NC	2.90E+02	NC	2.4E-06	--	0%
gamma-Chlordane	4.5E-03	2.20E+00	5.00E+02	2.0E-09	9.0E-06	0%	0%
PCB-1254 (Aroclor 1254)	0.0E+00	9.40E-01	NA	0.0E+00	NA	0%	--
PCB-1260 (Aroclor 1260)	2.1E-02	9.40E-01	NA	2.2E-08	NA	0%	--
TOTAL				**4E-05**	**7.3E+00**		
TOTAL without Arsenic				**3E-06**	**3.7E+00**		
TOTAL without B(a)P TEQ				**4E-05**	**7.3E+00**		

Notes and Abbreviations:

[1] Screening levels based first on SF RWQCB Environmental Screening Levels, January 2019 and supplemented by U.S. EPA Regional Screening Levels May 2019).

NC = Noncarcinogen NA = Not Available

TABLE 8
SUMMARY OF EXCESS LIFETIME CANCER RISK AND NONCANCER HAZARD
CHEMICALS IN SOIL AREA OF HVOC PLUME - FUTURE WORKER
Brisbane Baylands OU-2
Brisbane, California

Analyte	Exposure Point Concentration mg/kg	Screening Level Cancer mg/kg	Screening Level Noncancer mg/kg	Excess Cancer Risk	Noncancer Hazard Index	Percent Contribution Cancer	Percent Contribution Noncancer
Volatile Organic Compounds (VOCs)							
Chloroform	7.7E-03	1.40E+00	1.00E+03	5.5E-09	7.7E-06	0%	0%
cis-1,2-Dichloroethene	4.9E+02	NC	8.50E+01	NC	5.8E+00	--	9%
Ethylbenzene	5.3E-03	2.60E+01	2.10E+04	2.0E-10	2.5E-07	0%	0%
Tetrachloroethene (PCE)	4.8E+03	2.70E+00	3.90E+02	1.8E-03	1.2E+01	92%	19%
trans-1,2-Dichloroethene	2.5E+02	NC	6.00E+02	NC	4.2E-01	--	1%
Trichloroethene (TCE)	8.6E+02	6.10E+00	1.90E+01	1.4E-04	4.5E+01	7%	71%
Vinyl Chloride	2.3E+00	1.50E-01	3.80E+02	1.5E-05	6.1E-03	1%	0%
Xylenes, Total	3.1E-02	NC	2.50E+03	NC	1.2E-05	--	0%
TOTAL				**2E-03**	**6.4E+01**		

Notes and Abbreviations:

[1] Screening levels based first on SF RWQCB Environmental Screening Levels, January 2019 and supplemented by U.S. EPA Regional Screening Levels May 2019).

NC = Noncarcinogen NA = Not Available

TABLE 9
SUMMARY OF EXCESS LIFETIME CANCER RISK AND NONCANCER HAZARD
CHEMICALS IN SOIL ALL AREAS EXCEPT FOR ZONE 4 - FUTURE RESIDENT
Brisbane Baylands OU-2
Brisbane, California

Analyte	Exposure Point Concentration mg/kg	Screening Level Cancer mg/kg	Screening Level Noncancer mg/kg	Excess Cancer Risk	Noncancer Hazard Index	Percent Contribution Cancer	Percent Contribution Noncancer
Metals							
Antimony	5.8E+01	NC	1.1E+01	NC	5.3E+00	--	2.3%
Arsenic	5.8E+01	6.7E-02	2.6E-01	8.6E-04	2.2E+02	97.1%	95.1%
Barium	4.3E+02	NC	1.5E+04	NC	2.9E-02	--	0.0%
Beryllium	2.9E-01	1.6E+03	1.6E+01	1.8E-10	1.8E-02	0.0%	0.0%
Cadmium	2.3E+00	9.1E+02	7.8E+01	2.5E-09	3.0E-02	0.0%	0.0%
Chromium	1.3E+02	NC	1.2E+05	NC	1.1E-03	--	0.0%
Cobalt	3.6E+01	4.2E+02	2.3E+01	8.6E-08	1.6E+00	0.0%	0.7%
Copper	2.0E+03	NC	3.1E+03	NC	6.4E-01	--	0.3%
Lead	1.1E+03	8.2E+01	8.0E+01	1.4E-05	NA	1.5%	--
Mercury	8.1E-01	NC	1.3E+01	NC	6.2E-02	--	0.0%
Molybdenum	5.5E+00	NC	3.9E+02	NC	1.4E-02	--	0.0%
Nickel	8.5E+01	1.5E+04	8.2E+02	5.7E-09	1.0E-01	0.0%	0.0%
Selenium	1.3E+00	NC	3.9E+02	NC	3.4E-03	--	0.0%
Silver	1.1E+00	NC	3.9E+02	NC	2.8E-03	--	0.0%
Thallium	4.1E-01	NC	7.8E-01	NC	5.2E-01	--	0.2%
Vanadium	5.8E+02	NC	3.9E+02	NC	1.5E+00	--	0.6%
Zinc	7.2E+02	NC	2.3E+04	NC	3.1E-02	--	0.0%
Volatile Organic Compounds (VOCs) and Total Petroleum Hydrocarbons as Gasoline							
1,1,1-Trichloroethane	0.0E+00	NC	1.7E+03	NC	0.0E+00	--	0.0%
1,1,2-Trichloro1,2,2trifluoroethane	7.5E-03	NC	6.7E+03	NC	1.1E-06	--	0.0%
1,1-Dichloroethane	0.0E+00	3.6E+00	1.6E+04	0.0E+00	0.0E+00	0.0%	0.0%
1,2,4-Trimethylbenzene	2.4E-01	NC	3.0E+02	NC	8.1E-04	--	0.0%
1,3,5-Trimethylbenzene	1.4E-01	NC	2.7E+02	NC	5.0E-04	--	0.0%
2-Butanone	4.8E-03	NC	2.7E+04	NC	1.8E-07	--	0.0%
4-Isopropyltoluene	2.6E-02	NC	1.1E+03	NC	2.4E-05	--	0.0%
4-Methyl-2pentanone	4.0E+00	NC	3.4E+04	NC	1.2E-04	--	0.0%
Benzene	4.7E-02	3.3E-01	1.1E+01	1.4E-07	4.3E-03	0.0%	0.0%
Carbon disulfide	4.4E-04	NC	7.7E+02	NC	5.8E-07	--	0.0%
Chloroethane	0.0E+00	NC	1.4E+04	NC	0.0E+00	--	0.0%
Chloroform	1.4E-03	3.2E-01	2.0E+02	4.4E-09	7.0E-06	0.0%	0.0%
cis-1,2-Dichloroethene	3.6E-04	NC	1.9E+01	NC	1.9E-05	--	0.0%
Ethylbenzene	6.1E-03	5.9E+00	3.4E+03	1.0E-09	1.8E-06	0.0%	0.0%
Isopropylbenzene	5.1E-02	NC	1.9E+03	NC	2.7E-05	--	0.0%
Methyl-tert-butyl ether (MTBE)	3.9E-04	4.7E+01	1.6E+04	8.3E-12	2.4E-08	0.0%	0.0%
Naphthalene	4.2E-02	3.8E+00	1.3E+02	1.1E-08	3.3E-04	0.0%	0.0%
n-Butylbenzene	2.2E-02	NC	3.9E+03	NC	5.5E-06	--	0.0%
n-Propylbenzene	3.4E-02	NC	3.8E+03	NC	9.1E-06	--	0.0%
sec-Butylbenzene	2.1E-02	NC	7.8E+03	NC	2.7E-06	--	0.0%
tert-Butylbenzene	1.1E+00	NC	7.8E+03	NC	1.4E-04	--	0.0%
Tetrachloroethene (PCE)	3.5E-04	5.9E-01	8.2E+01	5.9E-10	4.3E-06	0.0%	0.0%
Toluene	9.1E-02	NC	1.1E+03	NC	8.3E-05	--	0.0%
Trichloroethene (TCE)	3.1E-02	9.5E-01	4.2E+00	3.3E-08	7.4E-03	0.0%	0.0%
Vinyl Chloride	2.4E-04	8.3E-03	7.0E+01	2.8E-08	3.4E-06	0.0%	0.0%
Xylenes, Total	8.1E-04	NC	5.8E+02	NC	1.4E-06	--	0.0%
TPH Gasoline (C4-C12)	8.0E-02	NC	4.3E+02	NC	1.9E-04	--	0.0%

TABLE 9
SUMMARY OF EXCESS LIFETIME CANCER RISK AND NONCANCER HAZARD
CHEMICALS IN SOIL ALL AREAS EXCEPT FOR ZONE 4 - FUTURE RESIDENT
Brisbane Baylands OU-2
Brisbane, California

Analyte	Exposure Point Concentration mg/kg	Screening Level Cancer mg/kg	Screening Level Noncancer mg/kg	Excess Cancer Risk	Noncancer Hazard Index	Percent Contribution Cancer	Percent Contribution Noncancer
Polynuclear Aromatic Hydrocarbons and Total Petroleum Hydrocarbons as Diesel							
2-Methylnaphthalene	9.8E-02	NC	2.4E+02	NC	4.1E-04	--	0.0%
Acenaphthene	6.7E-02	NC	3.6E+03	NC	1.9E-05	--	0.0%
Acenaphthylene	6.5E-02	NC	3.6E+03	NC	1.8E-05	--	0.0%
Anthracene	1.5E-01	NC	1.8E+04	NC	8.6E-06	--	0.0%
Benzo(a)anthracene	2.8E-01	1.1E+00	NA	2.6E-07	NA	0.0%	--
Benzo(a)pyrene	3.8E-01	1.1E-01	1.8E+01	3.5E-06	2.1E-02	0.4%	0.0%
Benzo(b)fluoranthene	5.3E-01	1.1E+00	NA	4.8E-07	NA	0.1%	--
Benzo(g,h,i)perylene	2.3E-01	NC	NA	NC	NA	--	--
Benzo(k)fluoranthene	1.8E-01	1.1E+01	NA	1.7E-08	NA	0.0%	--
Chrysene	4.6E-01	1.1E+02	NA	4.2E-09	NA	0.0%	--
Dibenzo(a,h)anthracene	1.1E-01	1.1E-01	NA	9.6E-07	NA	0.1%	--
Fluoranthene	5.0E-01	NC	2.4E+03	NC	2.1E-04	--	0.0%
Fluorene	1.6E-02	NC	2.4E+03	NC	6.8E-06	--	0.0%
Indeno(1,2,3-cd)pyrene	1.4E-01	1.1E+00	NA	1.3E-07	NA	0.0%	--
Naphthalene	1.1E-01	3.8E+00	1.3E+02	2.9E-08	8.4E-04	0.0%	0.0%
Phenanthrene	3.8E-01	NC	NA	NC	NA	--	--
Pyrene	7.1E-01	NC	1.8E+03	NC	3.9E-04	--	0.0%
B(a)P TEQ	6.1E-01	1.1E-01	1.8E+01	5.5E-06	3.4E-02	--	--
TPH-Diesel (C10-C28)	3.7E+02	NC	2.6E+02	NC	1.4E+00	--	0.6%
TPH-Motor Oil	7.8E+02	NC	1.2E+04	NC	6.5E-02	--	0.0%
Organochlorine Pesticides and Polychlorinated Biphenyls							
4,4'-DDD	1.7E-03	2.7E+00	NA	6.3E-10	NA	0.0%	--
4,4'-DDE	1.7E-02	1.8E+00	NA	9.5E-09	NA	0.0%	--
4,4'-DDT	6.4E-03	1.9E+00	3.7E+01	3.4E-09	1.7E-04	0.0%	0.0%
alpha-Chlordane	3.8E-03	4.8E-01	3.6E+01	7.9E-09	1.1E-04	0.0%	0.0%
Chlordane	1.9E-02	4.8E-01	3.6E+01	4.0E-08	5.3E-04	0.0%	0.0%
Dieldrin	2.5E-03	3.7E-02	3.5E+00	6.7E-08	7.1E-04	0.0%	0.0%
Endrin	1.7E-03	NC	2.1E+01	NC	8.3E-05	--	0.0%
Endrin aldehyde	0.0E+00	NC	2.1E+01	NC	0.0E+00	--	0.0%
Endrin ketone	0.0E+00	NC	2.1E+01	NC	0.0E+00	--	0.0%
gamma-Chlordane	8.2E-04	4.8E-01	3.6E+01	1.7E-09	2.3E-05	0.0%	0.0%
PCB-1254 (Aroclor 1254)	2.4E-02	2.3E-01	NA	1.0E-07	NA	0.0%	--
PCB-1260 (Aroclor 1260)	9.1E-02	2.3E-01	NA	4.0E-07	NA	0.0%	--
TOTAL with Arsenic				**9E-04**	**2.3E+02**		
TOTAL without Arsenic				**3E-05**	**1.1E+01**		
TOTAL without B(a)P TEQ				**9E-04**	**2.3E+02**		

Notes and Abbreviations:

[1] Screening levels based first on SF RWQCB Environmental Screening Levels, January 2019 and supplemented by U.S. EPA Regional Screening Levels May 2019).

NC = Noncarcinogen NA = Not Available

TABLE 10
SUMMARY OF EXCESS LIFETIME CANCER RISK AND NONCANCER HAZARD
CHEMICALS IN SOIL ZONE 4 - FUTURE RESIDENT
Brisbane Baylands OU-2
Brisbane, California

Analyte	Exposure Point Concentration mg/kg	Screening Level Cancer mg/kg	Screening Level Noncancer mg/kg	Excess Cancer Risk	Noncancer Hazard Index	Percent Contribution Cancer	Percent Contribution Noncancer
Metals							
Antimony	3.6E+01	NC	1.1E+01	NC	3.3E+00	--	4.8%
Arsenic	1.3E+01	6.7E-02	2.6E-01	1.9E-04	4.9E+01	86.0%	70.4%
Barium	8.4E+01	NC	1.5E+04	NC	5.6E-03	--	0.0%
Beryllium	2.0E-01	1.6E+03	1.6E+01	1.2E-10	1.2E-02	0.0%	0.0%
Cadmium	7.6E-01	9.1E+02	7.8E+01	8.3E-10	9.7E-03	0.0%	0.0%
Chromium	3.3E+01	NC	1.2E+05	NC	2.8E-04	--	0.0%
Cobalt	9.5E+00	4.2E+02	2.3E+01	2.3E-08	4.1E-01	0.0%	0.6%
Copper	1.6E+02	NC	3.1E+03	NC	5.3E-02	--	0.1%
Lead	5.4E+02	8.2E+01	8.0E+01	6.6E-06	NA	3.0%	--
Mercury	5.3E-01	NC	1.3E+01	NC	4.1E-02	--	0.1%
Molybdenum	1.0E+00	NC	3.9E+02	NC	2.7E-03	--	0.0%
Nickel	4.0E+01	1.5E+04	8.2E+02	2.7E-09	4.8E-02	0.0%	0.1%
Selenium	1.3E+00	NC	3.9E+02	NC	3.3E-03	--	0.0%
Silver	3.3E-01	NC	3.9E+02	NC	8.4E-04	--	0.0%
Thallium	4.4E-01	NC	7.8E-01	NC	5.7E-01	--	0.8%
Vanadium	6.9E+01	NC	3.9E+02	NC	1.8E-01	--	0.3%
Zinc	2.3E+02	NC	2.3E+04	NC	1.0E-02	--	0.0%
Volatile Organic Compounds (VOCs) and Total Petroleum Hydrocarbons as Gasoline							
1,1,1-Trichloroethane	1.2E-01	NC	1.7E+03	NC	7.1E-05	--	0.0%
1,1,2-Trichloro1,2,2trifluoroethane	0.0E+00	NC	6.7E+03	NC	0.0E+00	--	0.0%
1,1-Dichloroethane	1.2E-01	3.6E+00	1.6E+04	3.3E-08	7.5E-06	0.0%	0.0%
1,2,4-Trimethylbenzene	1.1E+00	NC	3.0E+02	NC	3.6E-03	--	0.0%
1,3,5-Trimethylbenzene	2.3E-01	NC	2.7E+02	NC	8.4E-04	--	0.0%
2-Butanone	6.3E-03	NC	2.7E+04	NC	2.3E-07	--	0.0%
4-Isopropyltoluene	1.1E-01	NC	1.1E+03	NC	1.0E-04	--	0.0%
4-Methyl-2pentanone	0.0E+00	NC	3.4E+04	NC	0.0E+00	--	0.0%
Benzene	9.2E-03	3.3E-01	1.1E+01	2.8E-08	8.3E-04	0.0%	0.0%
Carbon disulfide	2.4E-02	NC	7.7E+02	NC	3.1E-05	--	0.0%
Chloroethane	2.6E-01	NC	1.4E+04	NC	1.9E-05	--	0.0%
Chloroform	0.0E+00	3.2E-01	2.0E+02	0.0E+00	0.0E+00	0.0%	0.0%
cis-1,2-Dichloroethene	5.4E-01	NC	1.9E+01	NC	2.8E-02	--	0.0%
Ethylbenzene	5.3E-02	5.9E+00	3.4E+03	9.0E-09	1.6E-05	0.0%	0.0%
Isopropylbenzene	6.9E-02	NC	1.9E+03	NC	3.6E-05	--	0.0%
Methyl-tert-butyl ether (MTBE)	0.0E+00	4.7E+01	1.6E+04	0.0E+00	0.0E+00	0.0%	0.0%
Naphthalene	8.3E-01	3.8E+00	1.3E+02	2.2E-07	6.4E-03	0.1%	0.0%
n-Butylbenzene	4.0E-01	NC	3.9E+03	NC	1.0E-04	--	0.0%
n-Propylbenzene	2.1E-01	NC	3.8E+03	NC	5.6E-05	--	0.0%
sec-Butylbenzene	6.1E-02	NC	7.8E+03	NC	7.9E-06	--	0.0%
tert-Butylbenzene	0.0E+00	NC	7.8E+03	NC	0.0E+00	--	0.0%
Tetrachloroethene (PCE)	4.7E-04	5.9E-01	8.2E+01	8.0E-10	5.7E-06	0.0%	0.0%
Toluene	6.9E-02	NC	1.1E+03	NC	6.3E-05	--	0.0%
Trichloroethene (TCE)	4.8E-01	9.5E-01	4.2E+00	5.1E-07	1.1E-01	0.2%	0.2%
Vinyl Chloride	1.0E-01	8.3E-03	7.0E+01	1.2E-05	1.4E-03	5.5%	0.0%
Xylenes, Total	0.0E+00	NC	5.8E+02	NC	0.0E+00	--	0.0%
TPH Gasoline (C4-C12)	4.0E-01	NC	4.3E+02	NC	9.4E-04	--	0.0%

TABLE 10
SUMMARY OF EXCESS LIFETIME CANCER RISK AND NONCANCER HAZARD
CHEMICALS IN SOIL ZONE 4 - FUTURE RESIDENT
Brisbane Baylands OU-2
Brisbane, California

Analyte	Exposure Point Concentration mg/kg	Screening Level Cancer mg/kg	Screening Level Noncancer mg/kg	Excess Cancer Risk	Noncancer Hazard Index	Percent Contribution Cancer	Percent Contribution Noncancer
Polynuclear Aromatic Hydrocarbons and Total Petroleum Hydrocarbons as Diesel							
2-Methylnaphthalene	2.5E-01	NC	2.4E+02	NC	1.0E-03	--	0.0%
Acenaphthene	3.3E-01	NC	3.6E+03	NC	9.2E-05	--	0.0%
Acenaphthylene	8.3E-02	NC	3.6E+03	NC	2.3E-05	--	0.0%
Anthracene	6.6E-01	NC	1.8E+04	NC	3.7E-05	--	0.0%
Benzo(a)anthracene	5.6E-01	1.1E+00	NA	5.1E-07	NA	0.2%	--
Benzo(a)pyrene	4.2E-01	1.1E-01	1.8E+01	3.8E-06	2.3E-02	1.7%	0.0%
Benzo(b)fluoranthene	4.0E-01	1.1E+00	NA	3.7E-07	NA	0.2%	--
Benzo(g,h,i)perylene	2.2E-01	NC	NA	NC	NA	--	--
Benzo(k)fluoranthene	3.4E-01	1.1E+01	NA	3.1E-08	NA	0.0%	--
Chrysene	6.7E-01	1.1E+02	NA	6.1E-09	NA	0.0%	--
Dibenzo(a,h)anthracene	7.3E-02	1.1E-01	NA	6.6E-07	NA	0.3%	--
Fluoranthene	4.7E-01	NC	2.4E+03	NC	2.0E-04	--	0.0%
Fluorene	5.2E-01	NC	2.4E+03	NC	2.2E-04	--	0.0%
Indeno(1,2,3-cd)pyrene	1.0E-01	1.1E+00	NA	9.3E-08	NA	0.0%	--
Naphthalene	1.0E-01	3.8E+00	1.3E+02	2.7E-08	7.9E-04	0.0%	0.0%
Phenanthrene	2.8E+00	NC	NA	NC	NA	--	--
Pyrene	1.1E+00	NC	1.8E+03	NC	6.0E-04	--	0.0%
B(a)P TEQ	6.0E-01	1.1E-01	1.8E+01	5.5E-06	3.3E-02	--	--
TPH-Diesel (C10-C28)	4.0E+03	NC	2.6E+02	NC	1.6E+01	--	22.6%
TPH-Motor Oil	4.2E+03	NC	1.2E+04	NC	3.5E-01	--	0.5%
Organochlorine Pesticides and Polychlorinated Biphenyls							
4,4'-DDD	1.4E-03	2.7E+00	NA	5.2E-10	NA	0.0%	--
4,4'-DDE	1.5E-03	1.8E+00	NA	8.1E-10	NA	0.0%	--
4,4'-DDT	2.4E-03	1.9E+00	3.7E+01	1.2E-09	6.4E-05	0.0%	0.0%
alpha-Chlordane	1.1E-03	4.8E-01	3.6E+01	2.2E-09	3.0E-05	0.0%	0.0%
Chlordane	6.4E-02	4.8E-01	3.6E+01	1.3E-07	1.8E-03	0.1%	0.0%
Dieldrin	2.4E-03	3.7E-02	3.5E+00	6.5E-08	6.9E-04	0.0%	0.0%
Endrin	0.0E+00	NC	2.1E+01	NC	0.0E+00	--	0.0%
Endrin aldehyde	0.0E+00	NC	2.1E+01	NC	0.0E+00	--	0.0%
Endrin ketone	7.0E-04	NC	2.1E+01	NC	3.3E-05	--	0.0%
gamma-Chlordane	4.5E-03	4.8E-01	3.6E+01	9.4E-09	1.3E-04	0.0%	0.0%
PCB-1254 (Aroclor 1254)	0.0E+00	2.3E-01	NA	0.0E+00	NA	0.0%	--
PCB-1260 (Aroclor 1260)	2.1E-02	2.3E-01	NA	9.0E-08	NA	0.0%	--
TOTAL with Arsenic				**2E-04**	**6.9E+01**		
TOTAL without Arsenic				**3E-05**	**2.0E+01**		
TOTAL without B(a)P TEQ				**2E-04**	**6.9E+01**		

Notes and Abbreviations:

[1] Screening levels based first on SF RWQCB Environmental Screening Levels, January 2019 and supplemented by U.S. EPA Regional Screening Levels May 2019).

NC = Noncarcinogen NA = Not Available

TABLE 11
SUMMARY OF EXCESS LIFETIME CANCER RISK AND NONCANCER HAZARD
CHEMICALS IN SOIL AREA OF HVOC PLUME - FUTURE RESIDENT
Brisbane Baylands OU-2
Brisbane, California

Analyte	Exposure Point Concentration mg/kg	Screening Level Cancer mg/kg	Screening Level Noncancer mg/kg	Excess Cancer Risk	Noncancer Hazard Index	Percent Contribution Cancer	Percent Contribution Noncancer
Volatile Organic Compounds (VOCs)							
Chloroform	7.70E-03	3.2E-01	2.0E+02	2.4E-08	3.9E-05	0.0%	0.0%
cis-1,2-Dichloroethene	4.91E+02	NC	1.9E+01	NC	2.6E+01	--	8.9%
Ethylbenzene	5.30E-03	5.9E+00	3.4E+03	9.0E-10	1.6E-06	0.0%	0.0%
Tetrachloroethene (PCE)	4.80E+03	5.9E-01	8.2E+01	8.1E-03	5.9E+01	87.3%	20.1%
trans-1,2-Dichloroethene	2.50E+02	NC	1.3E+02	NC	1.9E+00	--	0.7%
Trichloroethene (TCE)	8.60E+02	9.5E-01	4.2E+00	9.1E-04	2.0E+02	9.7%	70.3%
Vinyl Chloride	2.30E+00	8.3E-03	7.0E+01	2.8E-04	3.3E-02	3.0%	0.0%
Xylenes, Total	3.10E-02	NC	5.8E+02	NC	5.3E-05	--	0.0%
TOTAL				**9E-03**	**2.9E+02**		

Notes and Abbreviations:

[1] Screening levels based first on SF RWQCB Environmental Screening Levels, January 2019 and supplemented by U.S. EPA Regional Screening Levels May 2019).

NC = Noncarcinogen NA = Not Available

TABLE 12

SUMMARY OF EXCESS LIFETIME CANCER RISK AND NONCANCER HAZARD
CHEMICALS IN SOIL ALL AREAS EXCEPT FOR ZONE 4 - FUTURE CONSTRUCTION WORKER

Brisbane Baylands OU-2
Brisbane, California

Analyte	Exposure Point Concentration mg/kg	Screening Level Cancer mg/kg	Screening Level Noncancer mg/kg	Excess Cancer Risk	Noncancer Hazard Index	Percent Contribution Cancer	Percent Contribution Noncancer
Metals							
Antimony	3.3E+01	NC	4.96E+01	NC	6.7E-01	--	1%
Arsenic	5.3E+01	2.03E+00	9.76E-01	2.6E-05	5.4E+01	96%	95%
Barium	3.0E+02	NC	3.02E+03	NC	9.9E-02	--	0%
Beryllium	1.1E-01	1.84E+02	2.72E+01	6.1E-10	4.1E-03	0%	0%
Cadmium	1.7E+00	1.05E+02	5.09E+01	1.6E-08	3.4E-02	0%	0%
Chromium	1.2E+02	NC	5.31E+05	NC	2.2E-04	--	0%
Cobalt	1.2E+01	4.91E+01	2.79E+01	2.4E-07	4.2E-01	1%	1%
Copper	1.0E+03	NC	1.42E+04	NC	7.4E-02	--	0%
Lead	1.3E+03	2.70E+03	1.60E+02	4.9E-07	NA	2%	--
Mercury	7.0E-01	NC	4.36E+01	NC	1.6E-02	--	0%
Molybdenum	1.7E+00	NC	1.77E+03	NC	9.4E-04	--	0%
Nickel	8.1E+01	1.70E+03	8.63E+01	4.8E-08	9.4E-01	0%	2%
Selenium	1.4E+00	NC	1.75E+03	NC	7.9E-04	--	0%
Silver	1.4E+00	NC	1.77E+03	NC	8.0E-04	--	0%
Thallium	6.0E-01	NC	3.54E+00	NC	1.7E-01	--	0%
Vanadium	6.1E+01	NC	4.66E+02	NC	1.3E-01	--	0%
Zinc	8.0E+02	NC	1.06E+05	NC	7.5E-03	--	0%
Volatile Organic Compounds (VOCs) and Total Petroleum Hydrocarbons as Gasoline							
1,1,1-Trichloroethane	0.0E+00	NC	7.20E+03	NC	0.0E+00	--	0%
1,1,2-Trichloro1,2,2trifluoroethane	7.5E-03	NC	NA	NC	NA	--	--
1,1-Dichloroethane	0.0E+00	3.68E+02	7.08E+04	0.0E+00	0.0E+00	0%	0%
1,2,4-Trimethylbenzene	2.4E-01	NC	NA	NC	NA	--	--
1,3,5-Trimethylbenzene	1.4E-01	NC	NA	NC	NA	--	--
2-Butanone	4.8E-03	NC	1.20E+05	NC	4.0E-08	--	0%
4-Isopropyltoluene	2.6E-02	NC	4.70E+03	NC	5.6E-06	--	0%
4-Methyl-2pentanone	4.0E+00	NC	1.40E+05	NC	2.8E-05	--	0%
Benzene	4.7E-02	3.28E+01	4.54E+01	1.4E-09	1.0E-03	0%	0%
Carbon disulfide	4.4E-04	NC	NA	NC	NA	--	--
Chloroethane	0.0E+00	NC	5.86E+04	NC	0.0E+00	--	0%
Chloroform	1.4E-03	3.38E+01	8.61E+02	4.1E-11	1.6E-06	0%	0%
cis-1,2-Dichloroethene	3.6E-04	NC	7.83E+01	NC	4.6E-06	--	0%
Ethylbenzene	6.1E-03	5.38E+02	1.47E+04	1.1E-11	4.1E-07	0%	0%
Isopropylbenzene	5.1E-02	NC	NA	NC	NA	--	--
Methyl-tert-butyl ether (MTBE)	3.9E-04	4.11E+03	6.54E+04	9.5E-14	6.0E-09	0%	0%
Naphthalene	4.2E-02	4.04E+02	5.01E+02	1.0E-10	8.5E-05	0%	0%
n-Butylbenzene	2.2E-02	NC	NA	NC	NA	--	--
n-Propylbenzene	3.4E-02	NC	NA	NC	NA	--	--
sec-Butylbenzene	2.1E-02	NC	NA	NC	NA	--	--
tert-Butylbenzene	1.1E+00	NC	NA	NC	NA	--	--
Tetrachloroethene (PCE)	3.5E-04	3.32E+01	3.49E+02	1.1E-11	1.0E-06	0%	0%
Toluene	9.1E-02	NC	4.70E+03	NC	1.9E-05	--	0%
Trichloroethene (TCE)	3.1E-02	1.27E+02	1.76E+01	2.4E-10	1.8E-03	0%	0%
Vinyl Chloride	2.4E-04	3.40E+00	3.02E+02	6.9E-11	7.8E-07	0%	0%
Xylenes, Total	8.1E-04	NC	2.40E+03	NC	3.4E-07	--	0%
TPH Gasoline (C4-C12)	8.0E-02	NC	1.80E+03	NC	4.5E-05	--	0%

TABLE 12

SUMMARY OF EXCESS LIFETIME CANCER RISK AND NONCANCER HAZARD
CHEMICALS IN SOIL ALL AREAS EXCEPT FOR ZONE 4 - FUTURE CONSTRUCTION WORKER

Brisbane Baylands OU-2
Brisbane, California

Analyte	Exposure Point Concentration mg/kg	Screening Level Cancer mg/kg	Screening Level Noncancer mg/kg	Excess Cancer Risk	Noncancer Hazard Index	Percent Contribution Cancer	Percent Contribution Noncancer
Polynuclear Aromatic Hydrocarbons and Total Petroleum Hydrocarbons as Diesel							
2-Methylnaphthalene	5.8E-01	NC	6.70E+02	NC	8.6E-04	--	0%
Acenaphthene	8.9E-02	NC	1.01E+04	NC	8.9E-06	--	0%
Acenaphthylene	8.4E-02	NC	NA	NC	NA	--	--
Anthracene	2.0E-01	NC	5.03E+04	NC	4.0E-06	--	0%
Benzo(a)anthracene	3.9E-01	1.13E+02	NA	3.4E-09	NA	0%	--
Benzo(a)pyrene	3.9E-01	1.14E+01	1.01E+01	3.4E-08	3.9E-02	0%	0%
Benzo(b)fluoranthene	2.9E-01	1.14E+02	NA	2.5E-09	NA	0%	--
Benzo(g,h,i)perylene	2.2E-01	NC	NA	NC	NA	--	--
Benzo(k)fluoranthene	2.0E-01	9.08E+02	NA	2.2E-10	NA	0%	--
Chrysene	2.6E-01	9.08E+03	NA	2.8E-11	NA	0%	--
Dibenzo(a,h)anthracene	5.3E-02	1.14E+01	NA	4.6E-09	NA	0%	--
Fluoranthene	3.0E-01	NC	6.70E+03	NC	4.4E-05	--	0%
Fluorene	1.1E-01	NC	6.70E+03	NC	1.6E-05	--	0%
Indeno(1,2,3-cd)pyrene	1.7E-01	1.14E+02	NA	1.5E-09	NA	0%	--
Naphthalene	8.2E-02	4.04E+02	5.01E+02	2.0E-10	1.6E-04	0%	0%
Phenanthrene	2.7E-01	NC	NA	NC	NA	--	--
Pyrene	4.5E-01	NC	5.03E+03	NC	9.0E-05	--	0%
B(a)P TEQ	5.5E-01	1.14E+01	1.01E+01	4.8E-08	5.4E-02	0%	0%
TPH-Diesel (C10-C28)	4.4E+02	NC	1.10E+03	NC	4.0E-01	--	1%
TPH-Motor Oil (C24-C36)	1.2E+03	1.14E+04	5.45E+04	1.0E-07	2.1E-02	0%	0%
Organochlorine Pesticides and Polychlorinated Biphenyls							
4,4'-DDD	3.8E-03	8.11E+04	NA	4.6E-14	NA	0%	--
4,4'-DDE	8.2E-03	5.68E+04	NA	1.4E-13	NA	0%	--
4,4'-DDT	1.8E-03	5.73E+04	1.41E+05	3.1E-14	1.3E-08	0%	0%
alpha-Chlordane	1.9E-03	1.40E+04	1.30E+05	1.4E-13	1.5E-08	0%	0%
Chlordane	9.4E-03	1.40E+04	1.28E+05	6.7E-13	7.4E-08	0%	0%
Dieldrin	1.4E-03	1.06E+03	1.24E+04	1.4E-12	1.2E-07	0%	0%
Endrin	1.0E-03	NC	7.44E+01	NC	1.4E-05	--	0%
Endrin aldehyde	6.7E-04	NC	7.44E+01	NC	9.0E-06	--	0%
Endrin ketone	0.0E+00	NC	7.44E+01	NC	0.0E+00	--	0%
gamma-Chlordane	1.7E-03	1.40E+04	1.30E+05	1.2E-13	1.3E-08	0%	0%
PCB-1254 (Aroclor 1254)	2.8E-02	5.49E+03	NA	5.0E-12	NA	0%	--
PCB-1260 (Aroclor 1260)	4.4E-02	5.49E+03	NA	8.0E-12	NA	0%	--
TOTAL				**3E-05**	**5.8E+01**		
TOTAL without Arsenic				**1E-06**	**3.1E+00**		
TOTAL without B(a)P TEQ				**3E-05**	**5.7E+01**		

Notes and Abbreviations:

[1] Screening levels based on SF RWQCB Environmental Screening Levels, January 2019.

NC = Noncarcinogen NA = Not Available

TABLE 13
SUMMARY OF EXCESS LIFETIME CANCER RISK AND NONCANCER HAZARD
CHEMICALS IN SOIL ZONE 4 - FUTURE CONSTRUCTION WORKER
Brisbane Baylands OU-2
Brisbane, California

Analyte	Exposure Point Concentration mg/kg	Screening Level Cancer mg/kg	Screening Level Noncancer mg/kg	Excess Cancer Risk	Noncancer Hazard Index	Percent Contribution Cancer	Percent Contribution Noncancer
Metals							
Antimony	1.0E+01	NC	4.96E+01	NC	2.1E-01	--	0%
Arsenic	5.6E+01	2.03E+00	9.76E-01	2.8E-05	5.8E+01	85%	86%
Barium	8.1E+02	NC	3.02E+03	NC	2.7E-01	--	0%
Beryllium	3.4E+00	1.84E+02	2.72E+01	1.8E-08	1.2E-01	0%	0%
Cadmium	2.4E+00	1.05E+02	5.09E+01	2.3E-08	4.8E-02	0%	0%
Chromium	5.0E+01	NC	5.31E+05	NC	9.5E-05	--	0%
Cobalt	1.2E+02	4.91E+01	2.79E+01	2.5E-06	4.4E+00	8%	7%
Copper	1.9E+03	NC	1.42E+04	NC	1.3E-01	--	0%
Lead	1.9E+03	2.70E+03	1.60E+02	7.0E-07	--	2%	--
Mercury	4.6E-02	NC	4.36E+01	NC	1.0E-03	--	0%
Molybdenum	8.0E+00	NC	1.77E+03	NC	4.5E-03	--	0%
Nickel	8.2E+01	1.70E+03	8.63E+01	4.8E-08	9.5E-01	0%	1%
Selenium	1.6E+00	NC	1.75E+03	NC	9.3E-04	--	0%
Silver	9.3E-01	NC	1.77E+03	NC	5.3E-04	--	0%
Thallium	3.9E-01	NC	3.54E+00	NC	1.1E-01	--	0%
Vanadium	1.2E+03	NC	4.66E+02	NC	2.6E+00	--	4%
Zinc	1.2E+03	NC	1.06E+05	NC	1.1E-02	--	0%
Volatile Organic Compounds (VOCs) and Total Petroleum Hydrocarbons as Gasoline							
1,1,1-Trichloroethane	1.2E-01	NC	7.20E+03	NC	1.7E-05	--	0%
1,1,2-Trichloro1,2,2trifluoroethane	0.0E+00	NC	NA	NC	NA	--	--
1,1-Dichloroethane	1.2E-01	3.68E+02	7.08E+04	3.3E-10	1.7E-06	0%	0%
1,2,4-Trimethylbenzene	1.1E+00	NC	NA	NC	NA	--	--
1,3,5-Trimethylbenzene	2.3E-01	NC	NA	NC	NA	--	--
2-Butanone	6.3E-03	NC	1.20E+05	NC	5.3E-08	--	0%
4-Isopropyltoluene	1.1E-01	NC	4.70E+03	NC	2.4E-05	--	0%
4-Methyl-2pentanone	0.0E+00	NC	1.40E+05	NC	0.0E+00	--	0%
Benzene	9.2E-03	3.28E+01	4.54E+01	2.8E-10	2.0E-04	0%	0%
Carbon disulfide	2.4E-02	NC	NA	NC	NA	--	--
Chloroethane	2.6E-01	NC	5.86E+04	NC	4.4E-06	--	0%
Chloroform	0.0E+00	3.38E+01	8.61E+02	0.0E+00	0.0E+00	0%	0%
cis-1,2-Dichloroethene	5.4E-01	NC	7.83E+01	NC	6.9E-03	--	0%
Ethylbenzene	5.3E-02	5.38E+02	1.47E+04	9.9E-11	3.6E-06	0%	0%
Isopropylbenzene	6.9E-02	NC	NA	NC	NA	--	--
Methyl-tert-butyl ether (MTBE)	0.0E+00	4.11E+03	6.54E+04	0.0E+00	0.0E+00	0%	0%
Naphthalene	8.3E-01	4.04E+02	5.01E+02	2.1E-09	1.7E-03	0%	0%
n-Butylbenzene	4.0E-01	NC	NA	NC	NA	--	--
n-Propylbenzene	2.1E-01	NC	NA	NC	NA	--	--
sec-Butylbenzene	6.1E-02	NC	NA	NC	NA	--	--
tert-Butylbenzene	0.0E+00	NC	NA	NC	NA	--	--
Tetrachloroethene (PCE)	4.7E-04	3.32E+01	3.49E+02	1.4E-11	1.3E-06	0%	0%
Toluene	6.9E-02	NC	4.70E+03	NC	1.5E-05	--	0%
Trichloroethene (TCE)	4.8E-01	1.27E+02	1.76E+01	3.8E-09	2.7E-02	0%	0%
Vinyl Chloride	1.0E-01	3.40E+00	3.02E+02	2.9E-08	3.3E-04	0%	0%
Xylenes, Total	0.0E+00	NC	2.40E+03	NC	0.0E+00	--	0%
TPH Gasoline (C4-C12)	4.0E-01	NC	1.80E+03	NC	2.2E-04	--	0%

TABLE 13
SUMMARY OF EXCESS LIFETIME CANCER RISK AND NONCANCER HAZARD
CHEMICALS IN SOIL ZONE 4 - FUTURE CONSTRUCTION WORKER
Brisbane Baylands OU-2
Brisbane, California

Analyte	Exposure Point Concentration mg/kg	Screening Level Cancer mg/kg	Screening Level Noncancer mg/kg	Excess Cancer Risk	Noncancer Hazard Index	Percent Contribution Cancer	Percent Contribution Noncancer
Polynuclear Aromatic Hydrocarbons and Total Petroleum Hydrocarbons as Diesel							
2-Methylnaphthalene	7.5E+00	NC	6.70E+02	NC	1.1E-02	--	0%
Acenaphthene	2.2E+00	NC	1.01E+04	NC	2.2E-04	--	0%
Acenaphthylene	5.5E-01	NC	NA	NC	NA	--	--
Anthracene	3.2E+00	NC	5.03E+04	NC	6.4E-05	--	0%
Benzo(a)anthracene	1.9E+00	1.13E+02	NA	1.7E-08	NA	0%	--
Benzo(a)pyrene	1.4E+00	1.14E+01	1.01E+01	1.2E-07	1.3E-01	0%	0%
Benzo(b)fluoranthene	1.0E+00	1.14E+02	NA	8.9E-09	NA	0%	--
Benzo(g,h,i)perylene	2.0E-01	NC	NA	NC	NA	--	--
Benzo(k)fluoranthene	5.2E-01	9.08E+02	NA	5.8E-10	NA	0%	--
Chrysene	3.2E+00	9.08E+03	NA	3.5E-10	NA	0%	--
Dibenzo(a,h)anthracene	3.2E-02	1.14E+01	NA	2.8E-09	NA	0%	--
Fluoranthene	9.5E-01	NC	6.70E+03	NC	1.4E-04	--	0%
Fluorene	2.9E+00	NC	6.70E+03	NC	4.4E-04	--	0%
Indeno(1,2,3-cd)pyrene	6.7E-02	1.14E+02	NA	5.9E-10	NA	0%	--
Naphthalene	1.3E+00	4.04E+02	5.01E+02	3.2E-09	2.6E-03	0%	0%
Phenanthrene	1.3E+01	NC	NA	NC	NA	--	--
Pyrene	6.7E+00	NC	5.03E+03	NC	1.3E-03	--	0%
B(a)P TEQ	1.8E+00	1.14E+01	1.01E+01	1.6E-07	1.8E-01	0%	0%
TPH-Diesel (C10-C28)	1.3E+04	NC	1.10E+03			0%	0%
TPH-Motor Oil (C24-C36)	1.4E+04	1.14E+04	5.45E+04	1.2E-06	2.5E-01	4%	0%
Organochlorine Pesticides and Polychlorinated Biphenyls							
4,4'-DDD	9.2E-04	8.11E+04	NA	1.1E-14	NA	0%	--
4,4'-DDE	8.6E-04	5.68E+04	NA	1.5E-14	NA	0%	--
4,4'-DDT	2.7E-03	5.73E+04	1.41E+05	4.8E-14	1.9E-08	0%	0%
alpha-Chlordane	6.8E-04	1.40E+04	1.30E+05	4.8E-14	5.2E-09	0%	0%
Chlordane	6.4E-02	1.40E+04	1.28E+05	4.6E-12	5.0E-07	0%	0%
Dieldrin	2.4E-03	1.06E+03	1.24E+04	2.3E-12	1.9E-07	0%	0%
Endrin	0.0E+00	NC	7.44E+01	NC	0.0E+00	--	0%
Endrin aldehyde	0.0E+00	NC	7.44E+01	NC	0.0E+00	--	0%
Endrin ketone	0.0E+00	NC	7.44E+01	NC	0.0E+00	--	0%
gamma-Chlordane	7.6E-04	1.40E+04	1.30E+05	5.4E-14	5.8E-09	0%	0%
PCB-1254 (Aroclor 1254)	0.0E+00	5.49E+03	NA	0.0E+00	NA	0%	--
PCB-1260 (Aroclor 1260)	1.9E-02	5.49E+03	NA	3.4E-12	NA	0%	--
TOTAL				**3E-05**	**6.7E+01**		
TOTAL without Arsenic				**5E-06**	**9.4E+00**		
TOTAL without B(a)P TEQ				**3E-05**	**6.7E+01**		

Notes and Abbreviations:

[1] Screening levels based first on SF RWQCB Environmental Screening Levels, January 2019 and supplemented by U.S. EPA Regional Screening Levels May 2019).

NC = Noncarcinogen NA = Not Available

TABLE 14

SUMMARY OF EXCESS LIFETIME CANCER RISK AND NONCANCER HAZARD
CHEMICALS IN SOIL AREA OF HVOC PLUME - FUTURE CONSTRUCTION WORKER

Brisbane Baylands OU-2
Brisbane, California

Analyte	Exposure Point Concentration mg/kg	Screening Level Cancer mg/kg	Screening Level Noncancer mg/kg	Excess Cancer Risk	Noncancer Hazard Index	Percent Contribution Cancer	Percent Contribution Noncancer
Volatile Organic Compounds (VOCs)							
Chloroform	7.7E-03	3.38E+01	8.61E+02	2.3E-10	8.9E-06	0%	0%
cis-1,2-Dichloroethene	4.9E+02	NC	7.83E+01	NC	6.3E+00	--	9%
Ethylbenzene	5.3E-03	5.38E+02	1.47E+04	9.9E-12	3.6E-07	0%	0%
Tetrachloroethene (PCE)	4.8E+03	3.32E+01	3.49E+02	1.4E-04	1.4E+01	95%	20%
trans-1,2-Dichloroethene	2.5E+02	NC	5.70E+02	NC	4.4E-01	--	1%
Trichloroethene (TCE)	8.6E+02	1.27E+02	1.76E+01	6.8E-06	4.9E+01	4%	70%
Vinyl Chloride	2.3E+00	3.40E+00	3.02E+02	6.8E-07	7.6E-03	0%	0%
Xylenes, Total	3.1E-02	NC	2.50E+03	NC	1.2E-05	--	0%
TOTAL				**2E-04**	**6.9E+01**		

Notes and Abbreviations:

[1] Screening levels based first on SF RWQCB Environmental Screening Levels, January 2019 and supplemented by U.S. EPA Regional Screening Levels May 2019).

NC = Noncarcinogen NA = Not Available

TABLE 15

SUMMARY OF EXCESS LIFETIME CANCER RISK AND NONCANCER HAZARD
INHALATION OF CHEMICALS IN AIR FROM SOIL ALL AREAS EXCEPT FOR ZONE 4 - OFF-SITE WORKER

Brisbane Baylands OU-2
Brisbane, California

Analyte	Exposure Point Concentration 0 - 2 ft bgs mg/kg	Exposure Point Concentration in Air µg/m^3	Screening Level Cancer µg/m^3	Screening Level Noncancer µg/m^3	Screening Level Reference	Excess Cancer Risk	Noncancer Hazard Index	Percent Contribution Cancer	Percent Contribution Noncancer
Metals									
Antimony	5.8E+01	9.0E-05	NC	NA	EPA RSL	NC	NA	--	--
Arsenic	5.8E+01	8.9E-05	2.9E-03	6.6E-02	DTSC	3.1E-08	1.3E-03	42%	16%
Barium	4.3E+02	6.6E-04	NC	2.2E+00	EPA RSL	NC	3.0E-04	--	4%
Beryllium	2.9E-01	4.4E-07	5.1E-03	3.1E-02	DTSC	8.6E-11	1.4E-05	0%	0%
Cadmium	2.3E+00	3.6E-06	NC	NA	DTSC	NC	NA	--	--
Chromium	1.3E+02	2.0E-04	NC	NA	DTSC	NC	NA	--	--
Cobalt	3.6E+01	5.6E-05	1.4E-03	2.6E-02	EPA RSL	4.0E-08	2.1E-03	54%	26%
Copper	2.0E+03	3.0E-03	NC	NA	EPA RSL	NC	NA	--	--
Lead	1.1E+03	1.7E-03	NC	NA	DTSC	NC	NA	--	--
Mercury	8.1E-01	1.2E-06	NC	1.3E-01	DTSC	NC	9.5E-06	--	0%
Molybdenum	5.5E+00	8.4E-06	NC	NA	EPA RSL	NC	NA	--	--
Nickel	8.5E+01	1.3E-04	4.7E-02	6.1E-02	DTSC	2.8E-09	2.1E-03	4%	26%
Selenium	1.3E+00	2.1E-06	NC	8.8E+01	EPA RSL	NC	2.3E-08	--	0%
Silver	1.1E+00	1.7E-06	NC	NA	EPA RSL	NC	NA	--	--
Thallium	4.1E-01	6.3E-07	NC	NA	EPA RSL	NC	NA	--	--
Vanadium	5.8E+02	8.9E-04	NC	4.4E-01	DTSC	NC	2.0E-03	--	25%
Zinc	7.2E+02	1.1E-03	NC	NA	EPA RSL	NC	NA	--	--
Volatile Organic Compounds (VOCs) and Total Petroleum Hydrocarbons as Gasoline									
1,1,1-Trichloroethane	0.0E+00	0.0E+00	NC	4.4E+03	esl	NC	0.0E+00	--	0%
1,1,2-Trichloro-1,2,2-trifluoroethane	7.5E-03	1.2E-08	NC	2.2E+04	rsl	NC	5.2E-13	--	0%
1,1-Dichloroethane	0.0E+00	0.0E+00	7.7E+00	3.5E+03	esl//dtsc	0.0E+00	0.0E+00	0%	0%
1,2,4-Trimethylbenzene	2.4E-01	3.7E-07	NC	2.6E+02	rsl	NC	1.4E-09	--	0%
1,3,5-Trimethylbenzene	1.4E-01	2.1E-07	NC	2.6E+02	rsl	NC	8.0E-10	--	0%
2-Butanone	4.8E-03	7.4E-09	NC	2.2E+04	esl	NC	3.3E-13	--	0%
4-Isopropyltoluene	2.6E-02	4.0E-08	NC	1.3E+03	toluene	NC	3.1E-11	--	0%
4-Methyl-2pentanone	4.0E+00	6.2E-06	NC	1.3E+04	esl	NC	4.7E-10	--	0%
Benzene	4.7E-02	7.2E-08	4.2E-01	1.3E+01	esl	1.7E-13	5.6E-09	0%	0%
Carbon disulfide	4.4E-04	6.8E-10	NC	3.1E+03	EPA RSL	NC	2.2E-13	--	0%
Chloroethane	0.0E+00	0.0E+00	NC	4.4E+04	esl	NC	0.0E+00	--	0%
Chloroform	1.4E-03	2.2E-09	5.3E-01	4.3E+02	esl	4.1E-15	5.0E-12	0%	0%
cis-1,2-Dichloroethene	3.6E-04	5.6E-10	NC	3.5E+01	esl	NC	1.6E-11	--	0%
Ethylbenzene	6.1E-03	9.4E-09	4.9E+00	4.4E+03	esl	1.9E-15	2.1E-12	0%	0%
Isopropylbenzene	5.1E-02	7.9E-08	NC	1.8E+03	EPA RSL	NC	4.4E-11	--	0%
Methyl-tert-butyl ether (MTBE)	3.9E-04	6.0E-10	4.7E+01	1.3E+04	esl	1.3E-17	4.6E-14	0%	0%
Naphthalene	4.2E-02	6.5E-08	3.6E-01	1.3E+01	esl	1.8E-13	5.0E-09	0%	0%
n-Butylbenzene	2.2E-02	3.3E-08	NC	NA	rsl	NC	NA	--	--
n-Propylbenzene	3.4E-02	5.3E-08	NC	4.4E+03	rsl	NC	1.2E-11	--	0%
sec-Butylbenzene	2.1E-02	3.2E-08	NC	NA	rsl	NC	NA	--	--
tert-Butylbenzene	1.1E+00	1.7E-06	NC	NA	rsl	NC	NA	--	--
Tetrachloroethene (PCE)	3.5E-04	5.4E-10	2.0E+00	1.8E+02	esl	2.7E-16	3.0E-12	0%	0%
Toluene	9.1E-02	1.4E-07	NC	1.3E+03	es	NC	1.1E-10	--	0%
Trichloroethene (TCE)	3.1E-02	4.8E-08	3.0E+00	8.8E+00	esl	1.6E-14	5.4E-09	0%	0%
Vinyl Chloride	2.4E-04	3.6E-10	1.6E-01	4.4E+02	esl	2.3E-15	8.2E-13	0%	0%
Xylenes, Total	8.1E-04	1.2E-09	NC	4.4E+02	esl	NC	2.8E-12	--	0%
TPH Gasoline (C4-C12)	8.0E-02	1.2E-07	NC	2.5E+03	esl	NC	5.0E-11	--	0%
Polynuclear Aromatic Hydrocarbons and Total Petroleum Hydrocarbons as Diesel									
2-Methylnaphthalene	9.8E-02	1.5E-07	NC	NA	EPA RSL	NC	NA	--	--
Acenaphthene	6.7E-02	1.0E-07	NC	1.1E+03	DTSC	NC	9.4E-11	--	0%
Acenaphthylene	6.5E-02	1.0E-07	NC	1.1E+03	acenapthene	NC	9.2E-11	--	0%
Anthracene	1.5E-01	2.4E-07	NC	5.3E+03	DTSC	NC	4.5E-11	--	0%
Benzo(a)anthracene	2.8E-01	4.4E-07	1.1E-01	NA	DTSC	4.0E-12	NA	0%	--
Benzo(a)pyrene	3.8E-01	5.9E-07	1.1E-02	8.8E-03	DTSC	5.3E-11	6.7E-05	0%	1%
Benzo(b)fluoranthene	5.3E-01	8.1E-07	1.1E-01	NA	DTSC	7.4E-12	NA	0%	--
Benzo(g,h,i)perylene	2.3E-01	3.5E-07	NC	7.0E+02	DTSC	NC	4.9E-10	--	0%
Benzo(k)fluoranthene	1.8E-01	2.8E-07	1.1E-01	NA	DTSC	2.6E-12	NA	0%	--
Chrysene	4.6E-01	7.1E-07	1.1E+00	NA	DTSC	6.4E-13	NA	0%	--
Dibenzo(a,h)anthracene	1.1E-01	1.6E-07	1.0E-02	NA	DTSC	1.6E-11	NA	0%	--
Fluoranthene	5.0E-01	7.7E-07	NC	7.0E+02	DTSC	NC	1.1E-09	--	0%
Fluorene	1.6E-02	2.5E-08	NC	7.0E+02	DTSC	NC	3.6E-11	--	0%
Indeno(1,2,3-cd)pyrene	1.4E-01	2.1E-07	1.1E-01	NA	DTSC	1.9E-12	NA	0%	--
Naphthalene	1.1E-01	1.7E-07	3.6E-01	1.3E+01	DTSC	4.6E-13	1.3E-08	0%	0%

TABLE 15

SUMMARY OF EXCESS LIFETIME CANCER RISK AND NONCANCER HAZARD
INHALATION OF CHEMICALS IN AIR FROM SOIL ALL AREAS EXCEPT FOR ZONE 4 - OFF-SITE WORKER

Brisbane Baylands OU-2
Brisbane, California

Analyte	Exposure Point Concentration 0 - 2 ft bgs mg/kg	Exposure Point Concentration in Air µg/m^3	Screening Level Cancer µg/m^3	Screening Level Noncancer µg/m^3	Screening Level Reference	Excess Cancer Risk	Noncancer Hazard Index	Percent Contribution Cancer	Percent Contribution Noncancer
Phenanthrene	3.8E-01	5.9E-07	NC	5.3E+02	pyrene	NC	1.1E-09	--	0%
Pyrene	7.1E-01	1.1E-06	NC	5.3E+02	DTSC	NC	2.1E-09	--	0%
B(a)P TEQ	6.1E-01	9.3E-07	1.1E-02	8.8E-03	DTSC	8.5E-11	1.1E-04	0%	1%
TPH-Diesel (C10-C28)	3.7E+02	5.7E-04	NC	1.1E+03	esl	NC	5.2E-07	--	0%
TPH-Motor Oil (C24-C36)	7.8E+02	1.2E-03	NC	NA	esl	NC	NA	--	--
Organochlorine Pesticides and Polychlorinated Biphenyls									
4,4'-DDD	1.7E-03	2.6E-09	1.8E-01	NA	EPA RSL	1.5E-14	NA	0%	--
4,4'-DDE	1.7E-02	2.6E-08	1.3E-01	NA	esl	2.0E-13	NA	0%	--
4,4'-DDT	6.4E-03	9.8E-09	1.3E-01	NA	EPA RSL	7.6E-14	NA	0%	--
alpha-Chlordane	3.8E-03	5.8E-09	1.2E-01	3.1E+00	chlordane	4.9E-14	1.9E-09	0%	0%
Chlordane	1.9E-02	2.9E-08	1.2E-01	3.1E+00	EPA RSL	2.4E-13	9.5E-09	0%	0%
Dieldrin	2.5E-03	3.8E-09	2.7E-03	NA	esl	1.4E-12	NA	0%	--
Endrin	1.7E-03	2.7E-09	NC	NA	EPA RSL	NC	NA	--	--
Endrin aldehyde	0.0E+00	0.0E+00	NC	NA	EPA RSL	NC	NA	--	--
Endrin ketone	0.0E+00	0.0E+00	NC	NA	EPA RSL	NC	NA	--	--
gamma-Chlordane	8.2E-04	1.3E-09	1.2E-01	3.1E+00	chlordane	1.1E-14	4.1E-10	0%	0%
PCB-1254 (Aroclor 1254)	2.4E-02	3.7E-08	2.2E-02	NA	esl	1.7E-12	NA	0%	--
PCB-1260 (Aroclor 1260)	9.1E-02	1.4E-07	2.2E-02	NA	esl	6.4E-12	NA	0%	--
TOTAL						**7E-08**	**8.2E-03**		

Notes and Abbreviations:

[1] Screening levels based first on SF RWQCB Environmental Screening Levels, February 2019 and supplemented by DTSC Modified Screening Levels (April 2019) and U.S. EPA Regional Screening Levels (Novembery 2019).

NC = Noncarcinogen NA = Not Available

TABLE 16

SUMMARY OF EXCESS LIFETIME CANCER RISK AND NONCANCER HAZARD
INHALATION OF CHEMICALS IN AIR FROM SOIL ZONE 4 - OFF-SITE WORKER

Brisbane Baylands OU-2
Brisbane, California

Analyte	Exposure Point Concentration 0 - 2 ft bgs mg/kg	Exposure Point Concentration in Air µg/m^3	Screening Level Cancer µg/m^3	Screening Level Noncancer µg/m^3	Screening Level Reference	Excess Cancer Risk	Noncancer Hazard Index	Percent Contribution Cancer	Percent Contribution Noncancer
Metals									
Antimony	3.6E+01	5.6E-05	NC	NA	EPA RSL	NC	NA	--	--
Arsenic	1.3E+01	1.9E-05	2.9E-03	6.6E-02	DTSC	6.7E-09	2.9E-04	36%	12%
Barium	8.4E+01	1.3E-04	NC	2.2E+00	EPA RSL	NC	5.9E-05	--	2%
Beryllium	2.0E-01	3.0E-07	5.1E-03	3.1E-02	DTSC	5.9E-11	9.8E-06	0%	0%
Cadmium	7.6E-01	1.2E-06	NC	NA	DTSC	NC	NA	--	--
Chromium	3.3E+01	5.1E-05	NC	NA	DTSC	NC	NA	--	--
Cobalt	9.5E+00	1.5E-05	1.4E-03	2.6E-02	EPA RSL	1.0E-08	5.6E-04	56%	24%
Copper	1.6E+02	2.5E-04	NC	NA	EPA RSL	NC	NA	--	--
Lead	5.4E+02	8.3E-04	NC	NA	DTSC	NC	NA	--	--
Mercury	5.3E-01	8.2E-07	NC	1.3E-01	DTSC	NC	6.3E-06	--	0%
Molybdenum	1.0E+00	1.6E-06	NC	NA	EPA RSL	NC	NA	--	--
Nickel	4.0E+01	6.1E-05	4.7E-02	6.1E-02	DTSC	1.3E-09	1.0E-03	7%	42%
Selenium	1.3E+00	2.0E-06	NC	8.8E+01	EPA RSL	NC	2.2E-08	--	0%
Silver	3.3E-01	5.0E-07	NC	NA	EPA RSL	NC	NA	--	--
Thallium	4.4E-01	6.8E-07	NC	NA	EPA RSL	NC	NA	--	--
Vanadium	6.9E+01	1.1E-04	NC	4.4E-01	DTSC	NC	2.4E-04	--	10%
Zinc	2.3E+02	3.6E-04	NC	NA	EPA RSL	NC	NA	--	--
Volatile Organic Compounds (VOCs) and Total Petroleum Hydrocarbons as Gasoline									
1,1,1-Trichloroethane	1.2E-01	1.8E-07	NC	4.4E+03	esl	NC	4.2E-11	--	0%
1,1,2-Trichloro-1,2,2-trifluoroethane	0.0E+00	0.0E+00	NC	2.2E+04	rsl	NC	0.0E+00	--	0%
1,1-Dichloroethane	1.2E-01	1.8E-07	7.7E+00	3.5E+03	esl//dtsc	2.4E-14	5.3E-11	0%	0%
1,2,4-Trimethylbenzene	1.1E+00	1.6E-06	NC	2.6E+02	rsl	NC	6.3E-09	--	0%
1,3,5-Trimethylbenzene	2.3E-01	3.5E-07	NC	2.6E+02	rsl	NC	1.3E-09	--	0%
2-Butanone	6.3E-03	9.7E-09	NC	2.2E+04	esl	NC	4.4E-13	--	0%
4-Isopropyltoluene	1.1E-01	1.8E-07	NC	1.3E+03	toluene	NC	1.4E-10	--	0%
4-Methyl-2pentanone	0.0E+00	0.0E+00	NC	1.3E+04	esl	NC	0.0E+00	--	0%
Benzene	9.2E-03	1.4E-08	4.2E-01	1.3E+01	esl	3.4E-14	1.1E-09	0%	0%
Carbon disulfide	2.4E-02	3.7E-08	NC	3.1E+03	EPA RSL	NC	1.2E-11	--	0%
Chloroethane	2.6E-01	4.0E-07	NC	4.4E+04	esl	NC	9.1E-12	--	0%
Chloroform	0.0E+00	0.0E+00	5.3E-01	4.3E+02	esl	0.0E+00	0.0E+00	0%	0%
cis-1,2-Dichloroethene	5.4E-01	8.3E-07	NC	3.5E+01	esl	NC	2.4E-08	--	0%
Ethylbenzene	5.3E-02	8.2E-08	4.9E+00	4.4E+03	esl	1.7E-14	1.9E-11	0%	0%
Isopropylbenzene	6.9E-02	1.1E-07	NC	1.8E+03	EPA RSL	NC	5.9E-11	--	0%
Methyl-tert-butyl ether (MTBE)	0.0E+00	0.0E+00	4.7E+01	1.3E+04	esl	0.0E+00	0.0E+00	0%	0%
Naphthalene	8.3E-01	1.3E-06	3.6E-01	1.3E+01	esl	3.6E-12	9.9E-08	0%	0%
n-Butylbenzene	4.0E-01	6.1E-07	NC	NA	rsl	NC	NA	--	--
n-Propylbenzene	2.1E-01	3.3E-07	NC	4.4E+03	rsl	NC	7.5E-11	--	0%
sec-Butylbenzene	6.1E-02	9.5E-08	NC	NA	rsl	NC	NA	--	--
tert-Butylbenzene	0.0E+00	0.0E+00	NC	NA	rsl	NC	NA	--	--
Tetrachloroethene (PCE)	4.7E-04	7.2E-10	2.0E+00	1.8E+02	esl	3.6E-16	4.0E-12	0%	0%
Toluene	6.9E-02	1.1E-07	NC	1.3E+03	es	NC	8.2E-11	--	0%
Trichloroethene (TCE)	4.8E-01	7.4E-07	3.0E+00	8.8E+00	esl	2.5E-13	8.4E-08	0%	0%
Vinyl Chloride	1.0E-01	1.5E-07	1.6E-01	4.4E+02	esl	9.6E-13	3.5E-10	0%	0%
Xylenes, Total	0.0E+00	0.0E+00	NC	4.4E+02	esl	NC	0.0E+00	--	0%
TPH Gasoline (C4-C12)	4.0E-01	6.2E-07	NC	2.5E+03	esl	NC	2.5E-10	--	0%
Polynuclear Aromatic Hydrocarbons and Total Petroleum Hydrocarbons as Diesel									
2-Methylnaphthalene	2.5E-01	3.9E-07	NC	NA	EPA RSL	NC	NA	--	--
Acenaphthene	3.3E-01	5.1E-07	NC	1.1E+03	DTSC	NC	4.6E-10	--	0%
Acenaphthylene	8.3E-02	1.3E-07	NC	1.1E+03	acenapthene	NC	1.2E-10	--	0%
Anthracene	6.6E-01	1.0E-06	NC	5.3E+03	DTSC	NC	1.9E-10	--	0%
Benzo(a)anthracene	5.6E-01	8.7E-07	1.1E-01	NA	DTSC	7.9E-12	NA	0%	--
Benzo(a)pyrene	4.2E-01	6.5E-07	1.1E-02	8.8E-03	DTSC	5.9E-11	7.3E-05	0%	3%
Benzo(b)fluoranthene	4.0E-01	6.2E-07	1.1E-01	NA	DTSC	5.6E-12	NA	0%	--
Benzo(g,h,i)perylene	2.2E-01	3.4E-07	NC	7.0E+02	DTSC	NC	4.9E-10	--	0%
Benzo(k)fluoranthene	3.4E-01	5.2E-07	1.1E-01	NA	DTSC	4.7E-12	NA	0%	--
Chrysene	6.7E-01	1.0E-06	1.1E+00	NA	DTSC	9.4E-13	NA	0%	--
Dibenzo(a,h)anthracene	7.3E-02	1.1E-07	1.0E-02	NA	DTSC	1.1E-11	NA	0%	--
Fluoranthene	4.7E-01	7.2E-07	NC	7.0E+02	DTSC	NC	1.0E-09	--	0%
Fluorene	5.2E-01	8.0E-07	NC	7.0E+02	DTSC	NC	1.1E-09	--	0%
Indeno(1,2,3-cd)pyrene	1.0E-01	1.6E-07	1.1E-01	NA	DTSC	1.4E-12	NA	0%	--
Naphthalene	1.0E-01	1.6E-07	3.6E-01	1.3E+01	DTSC	4.4E-13	1.2E-08	0%	0%

TABLE 16

SUMMARY OF EXCESS LIFETIME CANCER RISK AND NONCANCER HAZARD
INHALATION OF CHEMICALS IN AIR FROM SOIL ZONE 4 - OFF-SITE WORKER

Brisbane Baylands OU-2
Brisbane, California

Analyte	Exposure Point Concentration 0 - 2 ft bgs mg/kg	Exposure Point Concentration in Air µg/m^3	Screening Level Cancer µg/m^3	Screening Level Noncancer µg/m^3	Screening Level Reference	Excess Cancer Risk	Noncancer Hazard Index	Percent Contribution Cancer	Percent Contribution Noncancer
Phenanthrene	2.8E+00	4.3E-06	NC	5.3E+02	pyrene	NC	8.1E-09	--	0%
Pyrene	1.1E+00	1.7E-06	NC	5.3E+02	DTSC	NC	3.1E-09	--	0%
B(a)P TEQ	6.0E-01	9.3E-07	1.1E-02	8.8E-03	DTSC	8.4E-11	1.1E-04	0%	4%
TPH-Diesel (C10-C28)	4.0E+03	6.2E-03	NC	1.1E+03	esl	NC	5.7E-06	--	0%
TPH-Motor Oil (C24-C36)	4.2E+03	6.5E-03	NC	NA	esl	NC	NA	--	--
Organochlorine Pesticides and Polychlorinated Biphenyls									
4,4'-DDD	1.4E-03	2.1E-09	1.8E-01	NA	EPA RSL	1.2E-14	NA	0%	--
4,4'-DDE	1.5E-03	2.2E-09	1.3E-01	NA	esl	1.7E-14	NA	0%	--
4,4'-DDT	2.4E-03	3.6E-09	1.3E-01	NA	EPA RSL	2.8E-14	NA	0%	--
alpha-Chlordane	1.1E-03	1.6E-09	1.2E-01	3.1E+00	chlordane	1.4E-14	5.3E-10	0%	0%
Chlordane	6.4E-02	9.8E-08	1.2E-01	3.1E+00	EPA RSL	8.2E-13	3.2E-08	0%	0%
Dieldrin	2.4E-03	3.7E-09	2.7E-03	NA	esl	1.4E-12	NA	0%	--
Endrin	0.0E+00	0.0E+00	NC	NA	EPA RSL	NC	NA	--	--
Endrin aldehyde	0.0E+00	0.0E+00	NC	NA	EPA RSL	NC	NA	--	--
Endrin ketone	7.0E-04	1.1E-09	NC	NA	EPA RSL	NC	NA	--	--
gamma-Chlordane	4.5E-03	6.9E-09	1.2E-01	3.1E+00	chlordane	5.8E-14	2.2E-09	0%	0%
PCB-1254 (Aroclor 1254)	0.0E+00	0.0E+00	2.2E-02	NA	esl	0.0E+00	NA	0%	--
PCB-1260 (Aroclor 1260)	2.1E-02	3.2E-08	2.2E-02	NA	esl	1.4E-12	NA	0%	--
TOTAL						**2E-08**	**2.4E-03**		

Notes and Abbreviations:

[1] Screening levels based first on SF RWQCB Environmental Screening Levels, February 2019 and supplemented by DTSC Modified Screening Levels (April 2019) and U.S. EPA Regional Screening Levels (Novembery 2019).

NC = Noncarcinogen NA = Not Available

TABLE 17

SUMMARY OF EXCESS LIFETIME CANCER RISK AND NONCANCER HAZARD
INHALATION OF CHEMICALS IN AIR FROM SOIL ALL AREAS EXCEPT FOR ZONE 4 - OFF-SITE RESIDENT

Brisbane Baylands OU-2
Brisbane, California

Analyte	Exposure Point Concentration 0 - 2 ft bgs mg/kg	Exposure Point Concentration in Air µg/m^3	Screening Level Cancer µg/m^3	Screening Level Noncancer µg/m^3	Screening Level Reference	Excess Cancer Risk	Noncancer Hazard Index	Percent Contribution Cancer	Percent Contribution Noncancer
Metals									
Antimony	5.8E+01	9.0E-05	NC	NA	EPA RSL	NC	NA	--	--
Arsenic	5.8E+01	8.9E-05	2.9E-03	6.6E-02	DTSC	3.1E-08	1.3E-03	29%	15%
Barium	4.3E+02	6.6E-04	NC	2.2E+00	EPA RSL	NC	3.0E-04	--	3%
Beryllium	2.9E-01	4.4E-07	5.1E-03	3.1E-02	DTSC	8.6E-11	1.4E-05	0%	0%
Cadmium	2.3E+00	3.6E-06	NC	NA	DTSC	NC	NA	--	--
Chromium	1.3E+02	2.0E-04	NC	NA	DTSC	NC	NA	--	--
Cobalt	3.6E+01	5.6E-05	1.4E-03	2.6E-02	EPA RSL	4.0E-08	2.1E-03	38%	25%
Copper	2.0E+03	3.0E-03	NC	NA	EPA RSL	NC	NA	--	--
Lead	1.1E+03	1.7E-03	NC	NA	DTSC	NC	NA	--	--
Mercury	8.1E-01	1.2E-06	NC	1.3E-01	DTSC	NC	9.5E-06	--	0%
Molybdenum	5.5E+00	8.4E-06	NC	NA	EPA RSL	NC	NA	--	--
Nickel	8.5E+01	1.3E-04	4.7E-02	6.1E-02	DTSC	2.8E-09	2.1E-03	3%	25%
Selenium	1.3E+00	2.1E-06	NC	8.8E+01	EPA RSL	NC	2.3E-08	--	0%
Silver	1.1E+00	1.7E-06	NC	NA	EPA RSL	NC	NA	--	--
Thallium	4.1E-01	6.3E-07	NC	NA	EPA RSL	NC	NA	--	--
Vanadium	5.8E+02	8.9E-04	NC	4.4E-01	DTSC	NC	2.0E-03	--	23%
Zinc	7.2E+02	1.1E-03	NC	NA	EPA RSL	NC	NA	--	--
Volatile Organic Compounds (VOCs) and Total Petroleum Hydrocarbons as Gasoline									
1,1,1-Trichloroethane	0.0E+00	0.0E+00	NC	4.4E+03	esl	NC	0.0E+00	--	0%
1,1,2-Trichloro-1,2,2-trifluoroethane	7.5E-03	1.2E-08	NC	2.2E+04	rsl	NC	5.2E-13	--	0%
1,1-Dichloroethane	0.0E+00	0.0E+00	7.7E+00	3.5E+03	esl//dtsc	0.0E+00	0.0E+00	0%	0%
1,2,4-Trimethylbenzene	2.4E-01	3.7E-07	NC	2.6E+02	rsl	NC	1.4E-09	--	0%
1,3,5-Trimethylbenzene	1.4E-01	2.1E-07	NC	2.6E+02	rsl	NC	8.0E-10	--	0%
2-Butanone	4.8E-03	7.4E-09	NC	2.2E+04	esl	NC	3.3E-13	--	0%
4-Isopropyltoluene	2.6E-02	4.0E-08	NC	1.3E+03	toluene	NC	3.1E-11	--	0%
4-Methyl-2pentanone	4.0E+00	6.2E-06	NC	1.3E+04	esl	NC	4.7E-10	--	0%
Benzene	4.7E-02	7.2E-08	4.2E-01	1.3E+01	esl	1.7E-13	5.6E-09	0%	0%
Carbon disulfide	4.4E-04	6.8E-10	NC	3.1E+03	EPA RSL	NC	2.2E-13	--	0%
Chloroethane	0.0E+00	0.0E+00	NC	4.4E+04	esl	NC	0.0E+00	--	0%
Chloroform	1.4E-03	2.2E-09	5.3E-01	4.3E+02	esl	4.1E-15	5.0E-12	0%	0%
cis-1,2-Dichloroethene	3.6E-04	5.6E-10	NC	3.5E+01	esl	NC	1.6E-11	--	0%
Ethylbenzene	6.1E-03	9.4E-09	4.9E+00	4.4E+03	esl	1.9E-15	2.1E-12	0%	0%
Isopropylbenzene	5.1E-02	7.9E-08	NC	1.8E+03	EPA RSL	NC	4.4E-11	--	0%
Methyl-tert-butyl ether (MTBE)	3.9E-04	6.0E-10	4.7E+01	1.3E+04	esl	1.3E-17	4.6E-14	0%	0%
Naphthalene	4.2E-02	6.5E-08	3.6E-01	1.3E+01	esl	1.8E-13	5.0E-09	0%	0%
n-Butylbenzene	2.2E-02	3.3E-08	NC	NA	rsl	NC	NA	--	--
n-Propylbenzene	3.4E-02	5.3E-08	NC	4.4E+03	rsl	NC	1.2E-11	--	0%
sec-Butylbenzene	2.1E-02	3.2E-08	NC	NA	rsl	NC	NA	--	--
tert-Butylbenzene	1.1E+00	1.7E-06	NC	NA	rsl	NC	NA	--	--
Tetrachloroethene (PCE)	3.5E-04	5.4E-10	2.0E+00	1.8E+02	esl	2.7E-16	3.0E-12	0%	0%
Toluene	9.1E-02	1.4E-07	NC	1.3E+03	esl	NC	1.1E-10	--	0%
Trichloroethene (TCE)	3.1E-02	4.8E-08	3.0E+00	8.8E+00	esl	1.6E-14	5.4E-09	0%	0%
Vinyl Chloride	2.4E-04	3.6E-10	1.6E-01	4.4E+02	esl	2.3E-15	8.2E-13	0%	0%
Xylenes, Total	8.1E-04	1.2E-09	NC	4.4E+02	esl	NC	2.8E-12	--	0%
TPH Gasoline (C4-C12)	8.0E-02	1.2E-07	NC	2.5E+03	esl	NC	5.0E-11	--	0%
Polynuclear Aromatic Hydrocarbons and Total Petroleum Hydrocarbons as Diesel									
2-Methylnaphthalene	9.8E-02	1.5E-07	NC	NA	EPA RSL	NC	NA	--	--
Acenaphthene	6.7E-02	1.0E-07	NC	2.5E+02	DTSC	NC	4.1E-10	--	0%
Acenaphthylene	6.5E-02	1.0E-07	NC	2.5E+02	acenapthene	NC	4.0E-10	--	0%
Anthracene	1.5E-01	2.4E-07	NC	1.3E+03	DTSC	NC	1.9E-10	--	0%
Benzo(a)anthracene	2.8E-01	4.4E-07	9.2E-03	NA	esl	4.7E-11	NA	0%	--
Benzo(a)pyrene	3.8E-01	5.9E-07	9.2E-04	2.1E-03	DTSC	6.4E-10	2.8E-04	1%	3%
Benzo(b)fluoranthene	5.3E-01	8.1E-07	9.2E-03	NA	DTSC	8.8E-11	NA	0%	--
Benzo(g,h,i)perylene	2.3E-01	3.5E-07	NC	NA	---	NC	NA	--	--
Benzo(k)fluoranthene	1.8E-01	2.8E-07	9.2E-02	NA	DTSC	3.1E-12	NA	0%	--
Chrysene	4.6E-01	7.1E-07	9.1E-01	NA	DTSC	7.8E-13	NA	0%	--
Dibenzo(a,h)anthracene	1.1E-01	1.6E-07	9.2E-04	NA	DTSC	1.8E-10	NA	0%	--
Fluoranthene	5.0E-01	7.7E-07	NC	1.7E+02	DTSC	NC	4.6E-09	--	0%
Fluorene	1.6E-02	2.5E-08	NC	1.7E+02	DTSC	NC	1.5E-10	--	0%
Indeno(1,2,3-cd)pyrene	1.4E-01	2.1E-07	9.2E-03	NA	DTSC	2.3E-11	NA	0%	--
Naphthalene	1.1E-01	1.7E-07	8.3E-02	3.1E+00	esl	2.0E-12	5.4E-08	0%	0%

TABLE 17

SUMMARY OF EXCESS LIFETIME CANCER RISK AND NONCANCER HAZARD
INHALATION OF CHEMICALS IN AIR FROM SOIL ALL AREAS EXCEPT FOR ZONE 4 - OFF-SITE RESIDENT

Brisbane Baylands OU-2
Brisbane, California

Analyte	Exposure Point Concentration 0 - 2 ft bgs mg/kg	Exposure Point Concentration in Air µg/m^3	Screening Level Cancer µg/m^3	Screening Level Noncancer µg/m^3	Screening Level Reference	Excess Cancer Risk	Noncancer Hazard Index	Percent Contribution Cancer	Percent Contribution Noncancer
Phenanthrene	3.8E-01	5.9E-07	NC	1.3E+02	pyrene	NC	4.5E-09	--	0%
Pyrene	7.1E-01	1.1E-06	NC	1.3E+02	DTSC	NC	8.4E-09	--	0%
B(a)P TEQ	6.1E-01	9.3E-07	9.2E-04	2.1E-03	DTSC	1.0E-09	4.5E-04	1%	5%
TPH-Diesel (C10-C28)	3.7E+02	5.7E-04	NC	2.7E+02	esl	NC	2.1E-06	--	0%
TPH-Motor Oil (C24-C36)	7.8E+02	1.2E-03	NC	2.7E+02	esl	NC	4.5E-06	--	0%
Organochlorine Pesticides and Polychlorinated Biphenyls									
4,4'-DDD	1.7E-03	2.6E-09	4.1E-02	NA	EPA RSL	6.4E-14	NA	0%	--
4,4'-DDE	1.7E-02	2.6E-08	2.9E-02	NA	esl	9.0E-13	NA	0%	--
4,4'-DDT	6.4E-03	9.8E-09	2.9E-02	NA	EPA RSL	3.4E-13	NA	0%	--
alpha-Chlordane	3.8E-03	5.8E-09	2.8E-02	7.3E-01	chlordane	2.1E-13	8.0E-09	0%	0%
Chlordane	1.9E-02	2.9E-08	2.8E-02	7.3E-01	EPA RSL	1.0E-12	4.0E-08	0%	0%
Dieldrin	2.5E-03	3.8E-09	6.1E-04	NA	esl	6.3E-12	NA	0%	--
Endrin	1.7E-03	2.7E-09	NC	NA	EPA RSL	NC	NA	--	--
Endrin aldehyde	0.0E+00	0.0E+00	NC	NA	EPA RSL	NC	NA	--	--
Endrin ketone	0.0E+00	0.0E+00	NC	NA	EPA RSL	NC	NA	--	--
gamma-Chlordane	8.2E-04	1.3E-09	2.8E-02	7.3E-01	chlordane	4.5E-14	1.7E-09	0%	0%
PCB-1254 (Aroclor 1254)	2.4E-02	3.7E-08	4.9E-03	NA	esl	7.5E-12	NA	0%	--
PCB-1260 (Aroclor 1260)	9.1E-02	1.4E-07	4.9E-03	NA	esl	2.9E-11	NA	0%	--
TOTAL						**1E-07**	**8.7E-03**		

Notes and Abbreviations:

[1] Screening levels based first on SF RWQCB Environmental Screening Levels, February 2019 and supplemented by DTSC Modified Screening Levels (April 2019) and U.S. EPA Regional Screening Levels (Novembery 2019).

NC = Noncarcinogen NA = Not Available

TABLE 18

SUMMARY OF EXCESS LIFETIME CANCER RISK AND NONCANCER HAZARD
INHALATION OF CHEMICALS IN AIR FROM SOIL ZONE 4 - OFF-SITE RESIDENT

Brisbane Baylands OU-2
Brisbane, California

Analyte	Exposure Point Concentration 0 - 2 ft bgs mg/kg	Exposure Point Concentration in Air µg/m^3	Screening Level Cancer µg/m^3	Screening Level Noncancer µg/m^3	Screening Level Reference	Excess Cancer Risk	Noncancer Hazard Index	Percent Contribution Cancer	Percent Contribution Noncancer
Metals									
Antimony	3.6E+01	5.6E-05	NC	NA	EPA RSL	NC	NA	--	--
Arsenic	1.3E+01	1.9E-05	2.9E-03	6.6E-02	DTSC	6.7E-09	2.9E-04	33%	10%
Barium	8.4E+01	1.3E-04	NC	2.2E+00	EPA RSL	NC	5.9E-05	--	2%
Beryllium	2.0E-01	3.0E-07	5.1E-03	3.1E-02	DTSC	5.9E-11	9.8E-06	0%	0%
Cadmium	7.6E-01	1.2E-06	NC	NA	DTSC	NC	NA	--	--
Chromium	3.3E+01	5.1E-05	NC	NA	DTSC	NC	NA	--	--
Cobalt	9.5E+00	1.5E-05	1.4E-03	2.6E-02	EPA RSL	1.0E-08	5.6E-04	51%	19%
Copper	1.6E+02	2.5E-04	NC	NA	EPA RSL	NC	NA	--	--
Lead	5.4E+02	8.3E-04	NC	NA	DTSC	NC	NA	--	--
Mercury	5.3E-01	8.2E-07	NC	1.3E-01	DTSC	NC	6.3E-06	--	0%
Molybdenum	1.0E+00	1.6E-06	NC	NA	EPA RSL	NC	NA	--	--
Nickel	4.0E+01	6.1E-05	4.7E-02	6.1E-02	DTSC	1.3E-09	1.0E-03	6%	34%
Selenium	1.3E+00	2.0E-06	NC	8.8E+01	EPA RSL	NC	2.2E-08	--	0%
Silver	3.3E-01	5.0E-07	NC	NA	EPA RSL	NC	NA	--	--
Thallium	4.4E-01	6.8E-07	NC	NA	EPA RSL	NC	NA	--	--
Vanadium	6.9E+01	1.1E-04	NC	4.4E-01	DTSC	NC	2.4E-04	--	8%
Zinc	2.3E+02	3.6E-04	NC	NA	EPA RSL	NC	NA	--	--
Volatile Organic Compounds (VOCs) and Total Petroleum Hydrocarbons as Gasoline									
1,1,1-Trichloroethane	1.2E-01	1.8E-07	NC	4.4E+03	esl	NC	4.2E-11	--	0%
1,1,2-Trichloro-1,2,2-trifluoroethane	0.0E+00	0.0E+00	NC	2.2E+04	rsl	NC	0.0E+00	--	0%
1,1-Dichloroethane	1.2E-01	1.8E-07	7.7E+00	3.5E+03	esl//dtsc	2.4E-14	5.3E-11	0%	0%
1,2,4-Trimethylbenzene	1.1E+00	1.6E-06	NC	2.6E+02	rsl	NC	6.3E-09	--	0%
1,3,5-Trimethylbenzene	2.3E-01	3.5E-07	NC	2.6E+02	rsl	NC	1.3E-09	--	0%
2-Butanone	6.3E-03	9.7E-09	NC	2.2E+04	esl	NC	4.4E-13	--	0%
4-Isopropyltoluene	1.1E-01	1.8E-07	NC	1.3E+03	toluene	NC	1.4E-10	--	0%
4-Methyl-2-pentanone	0.0E+00	0.0E+00	NC	1.3E+04	esl	NC	0.0E+00	--	0%
Benzene	9.2E-03	1.4E-08	4.2E-01	1.3E+01	esl	3.4E-14	1.1E-09	0%	0%
Carbon disulfide	2.4E-02	3.7E-08	NC	3.1E+03	EPA RSL	NC	1.2E-11	--	0%
Chloroethane	2.6E-01	4.0E-07	NC	4.4E+04	esl	NC	9.1E-12	--	0%
Chloroform	0.0E+00	0.0E+00	5.3E-01	4.3E+02	esl	0.0E+00	0.0E+00	0%	0%
cis-1,2-Dichloroethene	5.4E-01	8.3E-07	NC	3.5E+01	esl	NC	2.4E-08	--	0%
Ethylbenzene	5.3E-02	8.2E-08	4.9E+00	4.4E+03	esl	1.7E-14	1.9E-11	0%	0%
Isopropylbenzene	6.9E-02	1.1E-07	NC	1.8E+03	EPA RSL	NC	5.9E-11	--	0%
Methyl-tert-butyl ether (MTBE)	0.0E+00	0.0E+00	4.7E+01	1.3E+04	esl	0.0E+00	0.0E+00	0%	0%
Naphthalene	8.3E-01	1.3E-06	3.6E-01	1.3E+01	esl	3.6E-12	9.9E-08	0%	0%
n-Butylbenzene	4.0E-01	6.1E-07	NC	NA	rsl	NC	NA	--	--
n-Propylbenzene	2.1E-01	3.3E-07	NC	4.4E+03	rsl	NC	7.5E-11	--	0%
sec-Butylbenzene	6.1E-02	9.5E-08	NC	NA	rsl	NC	NA	--	--
tert-Butylbenzene	0.0E+00	0.0E+00	NC	NA	rsl	NC	NA	--	--
Tetrachloroethene (PCE)	4.7E-04	7.2E-10	2.0E+00	1.8E+02	esl	3.6E-16	4.0E-12	0%	0%
Toluene	6.9E-02	1.1E-07	NC	1.3E+03	esl	NC	8.2E-11	--	0%
Trichloroethene (TCE)	4.8E-01	7.4E-07	3.0E+00	8.8E+00	esl	2.5E-13	8.4E-08	0%	0%
Vinyl Chloride	1.0E-01	1.5E-07	1.6E-01	4.4E+02	esl	9.6E-13	3.5E-10	0%	0%
Xylenes, Total	0.0E+00	0.0E+00	NC	4.4E+02	esl	NC	0.0E+00	--	0%
TPH Gasoline (C4-C12)	4.0E-01	6.2E-07	NC	2.5E+03	esl	NC	2.5E-10	--	0%
Polynuclear Aromatic Hydrocarbons and Total Petroleum Hydrocarbons as Diesel									
2-Methylnaphthalene	2.5E-01	3.9E-07	NC	NA	EPA RSL	NC	NA	--	--
Acenaphthene	3.3E-01	5.1E-07	NC	2.5E+02	DTSC	NC	2.0E-09	--	0%
Acenaphthylene	8.3E-02	1.3E-07	NC	2.5E+02	acenapthene	NC	5.1E-10	--	0%
Anthracene	6.6E-01	1.0E-06	NC	1.3E+03	DTSC	NC	8.1E-10	--	0%
Benzo(a)anthracene	5.6E-01	8.7E-07	9.2E-03	NA	esl	9.4E-11	NA	0%	--
Benzo(a)pyrene	4.2E-01	6.5E-07	9.2E-04	2.1E-03	DTSC	7.0E-10	3.1E-04	3%	10%
Benzo(b)fluoranthene	4.0E-01	6.2E-07	9.2E-03	NA	DTSC	6.7E-11	NA	0%	--
Benzo(g,h,i)perylene	2.2E-01	3.4E-07	NC	NA	---	NC	NA	--	--
Benzo(k)fluoranthene	3.4E-01	5.2E-07	9.2E-02	NA	DTSC	5.6E-12	NA	0%	--
Chrysene	6.7E-01	1.0E-06	9.1E-01	NA	DTSC	1.1E-12	NA	0%	--
Dibenzo(a,h)anthracene	7.3E-02	1.1E-07	9.2E-04	NA	DTSC	1.2E-10	NA	1%	--
Fluoranthene	4.7E-01	7.2E-07	NC	1.7E+02	DTSC	NC	4.3E-09	--	0%
Fluorene	5.2E-01	8.0E-07	NC	1.7E+02	DTSC	NC	4.7E-09	--	0%
Indeno(1,2,3-cd)pyrene	1.0E-01	1.6E-07	9.2E-03	NA	DTSC	1.7E-11	NA	0%	--
Naphthalene	1.0E-01	1.6E-07	8.3E-02	3.1E+00	esl	1.9E-12	5.1E-08	0%	0%

TABLE 18

SUMMARY OF EXCESS LIFETIME CANCER RISK AND NONCANCER HAZARD
INHALATION OF CHEMICALS IN AIR FROM SOIL ZONE 4 - OFF-SITE RESIDENT

Brisbane Baylands OU-2
Brisbane, California

Analyte	Exposure Point Concentration 0 - 2 ft bgs mg/kg	Exposure Point Concentration in Air µg/m^3	Screening Level Cancer µg/m^3	Screening Level Noncancer µg/m^3	Screening Level Reference	Excess Cancer Risk	Noncancer Hazard Index	Percent Contribution Cancer	Percent Contribution Noncancer
Phenanthrene	2.8E+00	4.3E-06	NC	1.3E+02	pyrene	NC	3.3E-08	--	0%
Pyrene	1.1E+00	1.7E-06	NC	1.3E+02	DTSC	NC	1.3E-08	--	0%
B(a)P TEQ	6.0E-01	9.3E-07	9.2E-04	2.1E-03	DTSC	1.0E-09	4.4E-04	5%	15%
TPH-Diesel (C10-C28)	4.0E+03	6.2E-03	NC	2.7E+02	esl	NC	2.3E-05	--	1%
TPH-Motor Oil (C24-C36)	4.2E+03	6.5E-03	NC	2.7E+02	esl	NC	2.4E-05	--	1%
Organochlorine Pesticides and Polychlorinated Biphenyls									
4,4'-DDD	1.4E-03	2.1E-09	4.1E-02	NA	EPA RSL	5.2E-14	NA	0%	--
4,4'-DDE	1.5E-03	2.2E-09	2.9E-02	NA	esl	7.8E-14	NA	0%	--
4,4'-DDT	2.4E-03	3.6E-09	2.9E-02	NA	EPA RSL	1.3E-13	NA	0%	--
alpha-Chlordane	1.1E-03	1.6E-09	2.8E-02	7.3E-01	chlordane	5.8E-14	2.2E-09	0%	0%
Chlordane	6.4E-02	9.8E-08	2.8E-02	7.3E-01	EPA RSL	3.5E-12	1.3E-07	0%	0%
Dieldrin	2.4E-03	3.7E-09	6.1E-04	NA	esl	6.1E-12	NA	0%	--
Endrin	0.0E+00	0.0E+00	NC	NA	EPA RSL	NC	NA	--	--
Endrin aldehyde	0.0E+00	0.0E+00	NC	NA	EPA RSL	NC	NA	--	--
Endrin ketone	7.0E-04	1.1E-09	NC	NA	EPA RSL	NC	NA	--	--
gamma-Chlordane	4.5E-03	6.9E-09	2.8E-02	7.3E-01	chlordane	2.5E-13	9.5E-09	0%	0%
PCB-1254 (Aroclor 1254)	0.0E+00	0.0E+00	4.9E-03	NA	esl	0.0E+00	NA	0%	--
PCB-1260 (Aroclor 1260)	2.1E-02	3.2E-08	4.9E-03	NA	esl	6.5E-12	NA	0%	--
TOTAL						**2E-08**	**3.0E-03**		

Notes and Abbreviations:

[1] Screening levels based first on SF RWQCB Environmental Screening Levels, February 2019 and supplemented by DTSC Modified Screening Levels (April 2019) and U.S. EPA Regional Screening Levels (Novembery 2019).

NC = Noncarcinogen NA = Not Available

TABLE 19a

COMPARISON OF EXPOSURE POINT CONCENTRATIONS TO GROUNDWATER VAPOR INTRUSION SCREENING LEVELS

Brisbane Baylands OU2

Brisbane, California

Analyte	95% UCL[1] µg/L	Residential Groundwater Vapor Intrusion ESL[2] µg/L	Commercial/Industrial Groundwater Vapor Intrusion ESL[2] µg/L	95% UCL > Residential Vapor Intrusion ESL?	95% UCL > Commercial/Industrial Vapor Intrusion ESL?
Volatile Organic Compounds and Total Petroleum Hydrocarbons					
1,1,1-Trichloroethane	1.8E+01	1.5E+03	6.3E+03		
1,1,2-Trichloro-1,2,2-trifluoroethane	1.1E+00	2.4E+02	1.0E+03		
1,1-Dichloroethane	2.4E+00	7.6E+00	3.3E+01		
1,1-Dichloroethene	4.4E-01	6.6E+01	2.8E+02		
1,2,3-Trichlorobenzene	4.1E-01	4.1E+01	1.7E+02		
1,2,4-Trimethylbenzene	3.9E-01	2.5E+02	1.0E+03		
1,2-Dichlorobenzene	2.5E-01	2.7E+03	1.1E+04		
1,3,5-Trimethylbenzene	2.1E-01	1.8E+02	7.2E+02		
4-Isopropyltoluene	4.0E-01	1.2E+03	4.9E+03		
Acetone	1.2E+01	2.3E+07	9.7E+07		
Benzene	8.0E-01	4.2E-01	1.8E+00	Yes	
cis-1,2-Dichloroethene	2.1E+00	4.9E+01	2.1E+02		
Ethylbenzene	4.1E-01	3.5E+00	1.5E+01		
Isopropylbenzene	2.8E-01	8.9E+02	3.8E+03		
Methyl-tert-butyl ether (MTBE)	1.6E+00	4.5E+02	2.0E+03		
Naphthalene	4.4E-01	4.6E+00	2.0E+01		
n-Butylbenzene	3.3E-01	--	--		
n-Propylbenzene	3.0E-01	2.3E+03	1.0E+04		
sec-Butylbenzene	1.9E-01	--	--		
Styrene	3.6E-01	8.5E+03	3.6E+04		
Tetrachloroethene (PCE)	2.4E-01	6.4E-01	2.8E+00		
Toluene	8.8E-01	1.2E+03	4.9E+03		
trans-1,2-Dichloroethene	6.0E-01	2.2E+02	9.2E+02		
Trichloroethene (TCE)	2.4E-01	1.2E+00	7.5E+00		
Vinyl Chloride	4.3E-01	8.6E-03	1.4E-01	Yes	Yes
Xylenes, Total	1.1E+00	3.9E+02	1.6E+03		
TPH-Gasoline (C4-C12)	6.0E+01	--	--		
TPH-Diesel (C10-C28)	2.6E+03	--	--		
TPH-Motor Oil (C24-C36)	1.2E+03	--	--		

Notes and Abbreviations:

1. The 95% UCL or the maximum detected concentration is presented, whichever is lower.

2. California Regional Water Quality Control Board, San Francisco Bay Region, January 2019, Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater, Table GW-3, Groundwater Vapor Intrusion Human Health RIsk Screening Levels.

UCL = upper confidence limit

-- = not available

TABLE 19b

COMPARISON OF EXPOSURE POINT CONCENTRATIONS IN AREA OF HVOC PLUME TO GROUNDWATER VAPOR INTRUSION SCREENING LEVELS

Brisbane Baylands OU2

Brisbane, California

Analyte	Maximum[1] µg/L	Residential Groundwater Vapor Intrusion ESL[2] µg/L	Commercial/Industrial Groundwater Vapor Intrusion ESL[2] µg/L	Maximum > Residential Vapor Intrusion ESL?	Maximum > Commercial/Industrial Vapor Intrusion ESL?
Volatile Organic Compounds					
cis-1,2-Dichloroethene	1.9E+05	4.9E+01	2.1E+02	Yes	Yes
Ethylbenzene	1.7E+01	3.5E+00	1.5E+01	Yes	Yes
Tetrachloroethene (PCE)	4.3E+04	6.4E-01	2.8E+00	Yes	Yes
Toluene	2.7E+00	1.2E+03	4.9E+03		
trans-1,2-Dichloroethene	3.7E+03	2.2E+02	9.2E+02	Yes	Yes
Trichloroethene (TCE)	1.3E+04	1.2E+00	7.5E+00	Yes	Yes
Vinyl Chloride	6.5E+04	8.6E-03	1.4E-01	Yes	Yes
Xylenes, Total	1.5E+01	3.9E+02	1.6E+03		

Notes and Abbreviations:

1. The maximum (average between shallow and deep sample results) concentration is presented due to a limited dataset.

2. California Regional Water Quality Control Board, San Francisco Bay Region, January 2019, Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater, Table GW-3, Groundwater Vapor Intrusion Human Health RIsk Screening Levels.

UCL = upper confidence limit

-- = not available

TABLE 20a

SUMMARY OF TRENCH AIR CONCENTRATIONS AND EXCESS LIFETIME CANCER RISK AND NONCANCER HAZARD FROM SOIL VAPOR INTO A TRENCH - SITEWIDE HYPOTHETICAL FUTURE CONSTRUCTION WORKER

Brisbane Baylands OU2
Brisbane, California

VOCs	Exposure Point Concentration (mg/m^3)	Shallow Volatilization Factor (VF_{trench}) (unitless)	Trench Air Exposure Point Concentration (EPC) (mg/m^3)	Exposure Concentration (ECc) in Trench Air Cancer Effects (mg/m^3)	Exposure Concentration (ECnc) in Trench Air Noncancer Effects (mg/m^3)	Unit Risk Factor $(mg/m^3)^{-1}$	Reference Concentration (mg/m^3)	Theoretical Excess Lifetime Cancer Risk (unitless)	Noncancer Hazard (unitless)
1,1,1-Trichloroethane	1.3E+01	1.5E-02	1.9E-01	6.2E-06	4.3E-04	--	1.0E+00	--	4.3E-04
1,1,2-Trichloro-1,2,2-trifluoroethane	2.4E+01	8.7E-03	2.1E-01	6.7E-06	4.7E-04	--	5.0E+00	--	9.4E-05
1,1-Dichloroethane	5.5E-01	1.9E-02	1.1E-02	3.5E-07	2.4E-05	1.6E-03	--	5.5E-10	--
1,1-Dichloroethene	4.8E-01	2.0E-02	9.6E-03	3.1E-07	2.2E-05	--	7.0E-02	--	3.1E-04
1,2,3-Trichlorobenzene	2.1E-02	9.2E-03	1.9E-04	6.2E-09	4.4E-07	--	2.0E-03	--	2.2E-04
1,2,4-Trimethylbenzene	9.8E-02	1.4E-02	1.4E-03	4.5E-08	3.1E-06	--	6.0E-02	--	5.2E-05
1,2-Dichlorobenzene	2.0E-02	1.3E-02	2.5E-04	8.3E-09	5.8E-07	--	2.0E-01	--	2.9E-06
1,3,5-Trimethylbenzene	7.7E-02	1.4E-02	1.1E-03	3.5E-08	2.4E-06	--	6.0E-02	--	4.1E-05
4-Isopropyltoluene	1.1E-01	1.8E-02	2.0E-03	6.4E-08	4.5E-06	--	3.0E-01	--	1.5E-05
Acetone	1.7E-02	2.5E-02	4.2E-04	1.4E-08	9.7E-07	--	3.1E+01	--	3.1E-08
Benzene	1.8E-01	2.1E-02	3.8E-03	1.2E-07	8.7E-06	2.9E-02	3.0E-03	3.6E-09	2.9E-03
Chloroethane	3.5E+01	2.3E-02	8.0E-01	2.6E-05	1.8E-03	--	1.0E+01	--	1.8E-04
cis-1,2-Dichloroethene	3.5E-01	2.0E-02	7.1E-03	2.3E-07	1.6E-05	--	8.0E-03	--	2.0E-03
Ethylbenzene	1.3E-01	1.6E-02	2.1E-03	6.7E-08	4.7E-06	2.5E-03	1.0E+00	1.7E-10	4.7E-06
Isopropylbenzene	1.3E-01	1.4E-02	1.8E-03	6.0E-08	4.2E-06	--	4.0E-01	--	1.0E-05
Methyl-tert-butyl ether (MTBE)	3.9E-02	1.7E-02	6.8E-04	2.2E-08	1.6E-06	2.6E-04	3.0E+00	5.8E-12	5.2E-07
Naphthalene	7.9E-03	1.4E-02	1.1E-04	3.6E-09	2.5E-07	3.4E-02	3.0E-03	1.2E-10	8.4E-05
n-Butylbenzene	2.1E-01	1.2E-02	2.6E-03	8.5E-08	5.9E-06	--	--	--	--
n-Propylbenzene	1.3E-01	1.4E-02	1.8E-03	5.8E-08	4.1E-06	--	1.0E+00	--	4.1E-06
sec-Butylbenzene	1.4E-01	1.2E-02	1.7E-03	5.5E-08	3.9E-06	--	--	--	--
Styrene	4.0E-02	1.6E-02	6.5E-04	2.1E-08	1.5E-06	--	9.0E-01	--	1.7E-06
Tetrachloroethene (PCE)	1.7E-01	1.2E-02	2.0E-03	6.5E-08	4.6E-06	6.1E-03	4.0E-02	4.0E-10	1.1E-04
Toluene	2.4E-01	1.8E-02	4.3E-03	1.4E-07	9.8E-06	--	3.0E-01	--	3.3E-05
trans-1,2-Dichloroethene	2.3E-01	2.0E-02	4.6E-03	1.5E-07	1.1E-05	--	8.0E-02	--	1.3E-04

TABLE 20a

SUMMARY OF TRENCH AIR CONCENTRATIONS AND EXCESS LIFETIME CANCER RISK AND NONCANCER HAZARD FROM SOIL VAPOR INTO A TRENCH - SITEWIDE HYPOTHETICAL FUTURE CONSTRUCTION WORKER

Brisbane Baylands OU2
Brisbane, California

VOCs	Exposure Point Concentration (mg/m^3)	Shallow Volatilization Factor (VF_{trench}) (unitless)	Trench Air Exposure Point Concentration (EPC) (mg/m^3)	Exposure Concentration (ECc) in Trench Air Cancer Effects (mg/m^3)	Exposure Concentration (ECnc) in Trench Air Noncancer Effects (mg/m^3)	Unit Risk Factor $(mg/m^3)^{-1}$	Reference Concentration (mg/m^3)	Theoretical Excess Lifetime Cancer Risk (unitless)	Noncancer Hazard (unitless)
Trichloroethene (TCE)	9.7E-02	1.6E-02	1.6E-03	5.1E-08	3.5E-06	4.1E-03	2.0E-03	2.1E-10	1.8E-03
Vinyl Chloride	4.8E-01	2.5E-02	1.2E-02	4.0E-07	2.8E-05	7.8E-02	1.0E-01	3.1E-08	2.8E-04
Xylenes, Total	3.0E-01	1.6E-02	4.8E-03	1.6E-07	1.1E-05	--	1.0E-01	--	1.1E-04
TPH-Gasoline (C4-C12)	4.4E+03	1.7E-02	7.4E+01	2.4E-03	1.7E-01	--	5.7E-01	--	3.0E-01
TOTAL								4E-08	3.0E-01

ECc = EPC x ET x CF x EF x ED / ATc

ECnc = EPC x ET x CF x EF x ED / ATnc

EPC = Csv x VF trench

EPC = trench air exposure point concentration (calculated from soil vapor)
ECc = exposure concentration cancer (calculated)
ECnc = exposure concentration noncancer (calculated)
ET = exposure time (1 hour/day)
CF = time conversion factor (1 day/24 hours)
EF = Exposure Frequency (20 days/year)
ED = Exposure Duration (1 year)
ATc = averaging time cancer (25550 days)
ATnc = averaging time noncancer (365 days)

TABLE 20b

SUMMARY OF TRENCH AIR CONCENTRATIONS AND EXCESS LIFETIME CANCER RISK AND NONCANCER HAZARD FROM SOIL VAPOR INTO A TRENCH - HVOC PLUME AREA HYPOTHETICAL FUTURE CONSTRUCTION WORKER

Brisbane Baylands OU2
Brisbane, California

VOCs	Exposure Point Concentration (mg/m^3)	Volatilization Factor (VF_{trench}) (unitless)	Trench Air Exposure Point Concentration (EPC) (mg/m^3)	Exposure Concentration (ECc) in Trench Air Cancer Effects (mg/m^3)	Exposure Concentration (ECnc) in Trench Air Noncancer Effects (mg/m^3)	Unit Risk Factor $(mg/m^3)^{-1}$	Reference Concentration (mg/m^3)	Theoretical Excess Lifetime Cancer Risk (unitless)	Noncancer Hazard (unitless)
cis-1,2-Dichloroethene	3.2E+04	2.0E-02	6.6E+02	2.1E-02	1.5E+00	--	8.0E-03	--	1.9E+02
Ethylbenzene	5.5E+00	1.6E-02	8.6E-02	2.8E-06	2.0E-04	2.5E-03	1.0E+00	7.0E-09	2.0E-04
Tetrachloroethene (PCE)	3.1E+04	1.2E-02	3.6E+02	1.2E-02	8.2E-01	6.1E-03	4.0E-02	7.2E-05	2.1E+01
Toluene	7.2E-01	1.8E-02	1.3E-02	4.3E-07	3.0E-05	--	3.0E-01	--	1.0E-04
trans-1,2-Dichloroethene	1.4E+03	2.0E-02	2.9E+01	9.4E-04	6.5E-02	--	8.0E-02	--	8.2E-01
Trichloroethene (TCE)	5.2E+03	1.6E-02	8.3E+01	2.7E-03	1.9E-01	4.1E-03	2.0E-03	1.1E-05	9.5E+01
Vinyl Chloride	7.1E+04	2.5E-02	1.8E+03	5.9E-02	4.1E+00	7.8E-02	1.0E-01	4.6E-03	4.1E+01
TPH-Gasoline (C4-C12)	1.1E+03	1.7E-02	1.8E+01	5.8E-04	4.1E-02	--	5.7E-01	--	7.2E-02
TOTAL								5E-03	3.5E+02

ECc = EPC x ET x CF x EF x ED / ATc

ECnc = EPC x ET x CF x EF x ED / ATnc

EPC = Csv x VF trench

EPC = trench air exposure point concentration (calculated from soil vapor)
ECc = exposure concentration cancer (calculated)
ECnc = exposure concentration noncancer (calculated)
ET = exposure time (1 hour/day)
CF = time conversion factor (1 day/24 hours)
EF = Exposure Frequency (20 days/year)
ED = Exposure Duration (1 year)
ATc = averaging time cancer (25550 days)
ATnc = averaging time noncancer (365 days)

TABLE 21a

COMPARISON OF EXPOSURE POINT CONCENTRATIONS TO GROUNDWATER SCREENING LEVELS FOR THE PROTECTION OF AQUATIC RECEPTORS

Brisbane Baylands OU2

Brisbane, California

Analyte	95% UCL[1] µg/L	Marine Aquatic SL[2] µg/L	Basis	95% UCL > Marine Aquatic SL x AF 100 ?
Metals				
Antimony	5.0E+01	5.0E+02	US EPA SW CCC	
Arsenic	2.1E+02	3.6E+01	CTR SW CCC	
Barium	4.8E+02	2.0E+02	BC SQuiRTs	
Beryllium	4.8E-01	1.0E+02	BC SQuiRTs	
Cadmium	3.3E-01	8.8E+00	BC SQuiRTs	
Chromium	1.7E+01	1.0E+03	10% US EPA SW Acute LOEL	
Chromium, Hexavalent	4.9E+00	5.0E+01	CTR SW CCC	
Cobalt	5.7E+00	1.0E+00	NZ SQuiRTs	
Copper	2.5E+01	3.1E+00	CTR SW CCC	
Lead	2.2E+01	8.1E+00	CTR SW CCC	
Mercury	1.1E-01	2.5E-02	Basin Plan	
Molybdenum	7.6E+00	2.3E+01	NZ SQuiRTs	
Nickel	9.3E+00	8.2E+00	CTR SW CCC	
Selenium	5.0E+00	5.0E-01	Basin Plan	
Silver	1.3E+00	1.9E-01	10% US EPA SW CMC	
Thallium	6.8E+00	2.1E+02	10% US EPA SW Acute LOEL	
Vanadium	1.4E+01	5.0E+01	BC SQuiRTs	
Zinc	7.8E+01	8.1E+01	CTR SW CCC	
Polynuclear Aromatic Hydrocarbons				
Acenaphthylene	1.4E-01	1.5E+01	Basin Plan	
Anthracene	3.2E-01	1.5E+01	Basin Plan	
Benzo(a)anthracene	2.0E-01	1.5E+01	Basin Plan	
Benzo(a)pyrene	2.4E-01	1.5E+01	Basin Plan	
Benzo(b)fluoranthene	2.5E-01	1.5E+01	Basin Plan	
Benzo(g,h,i)perylene	2.3E-01	1.5E+01	Basin Plan	
Benzo(k)fluoranthene	1.5E-01	1.5E+01	Basin Plan	
Chrysene	4.2E-01	1.5E+01	Basin Plan	
Dibenzo(a,h)anthracene	1.1E-01	1.5E+01	Basin Plan	
Fluoranthene	4.3E-01	8.0E+00	50% USEPA SW Chronic LOEL	
Fluorene	5.6E-01	1.5E+01	Basin Plan	
Indeno(1,2,3-cd)pyrene	1.9E-01	1.5E+01	Basin Plan	
Naphthalene	2.6E+00	1.5E+01	Basin Plan	
Acenaphthene	5.1E-01	1.5E+01	Basin Plan	
Phenanthrene	1.3E+00	4.6E+00	US EPA SW CCC	
Pyrene	9.3E-01	1.5E+01	Basin Plan	
Volatile Organic Compounds and Total Petroleum Hydrocarbons				
1,1,1-Trichloroethane	1.8E+01	3.1E+03	10% US EPA SW Acute LOEL	
1,1,2-Trichloro-1,2,2-trifluoroethane	1.1E+00	6.4E+03	SQuiRTs	
1,1-Dichloroethane	2.4E+00	--	--	
1,1-Dichloroethene	4.4E-01	2.2E+04	10% US EPA SW Acute LOEL	
1,2,3-Trichlorobenzene	4.1E-01	6.5E+01	50% US EPA SW Chronic LOEL (124TMB)	
1,2,4-Trimethylbenzene	3.9E-01	--	--	
1,2-Dichlorobenzene	2.5E-01	6.5E+01	50% US EPA SW Chronic LOEL	
1,3,5-Trimethylbenzene	2.1E-01	--	--	
4-Isopropyltoluene	4.0E-01	2.5E+03	50% US EPA SW Chronic LOEL (toluene)	
Acetone	1.2E+01	--	--	

TABLE 21a

COMPARISON OF EXPOSURE POINT CONCENTRATIONS TO GROUNDWATER SCREENING LEVELS FOR THE PROTECTION OF AQUATIC RECEPTORS

Brisbane Baylands OU2

Brisbane, California

Analyte	95% UCL[1] µg/L	Marine Aquatic SL[2] µg/L	Basis	95% UCL > Marine Aquatic SL x AF 100 ?
Benzene	8.0E-01	3.5E+02	50% US EPA SW Chronic LOEL	
cis-1,2-Dichloroethene	2.1E+00	2.2E+04	10% US EPA SW Acute LOEL	
Ethylbenzene	4.1E-01	4.3E+01	10% US EPA SW Acute LOEL	
Isopropylbenzene	2.8E-01	--	--	
Methyl-tert-butyl ether (MTBE)	1.6E+00	8.0E+03	CTR SW CCC	
Naphthalene	4.4E-01	1.5E+01	Basin Plan	
n-Butylbenzene	3.3E-01	--	--	
n-Propylbenzene	3.0E-01	--	--	
sec-Butylbenzene	1.9E-01	--	--	
Styrene	3.6E-01	--	--	
Tetrachloroethene (PCE)	2.4E-01	2.3E+02	50% US EPA SW Chronic LOEL	
Toluene	8.8E-01	2.5E+03	50% US EPA SW Chronic LOEL	
trans-1,2-Dichloroethene	6.0E-01	2.2E+04	10% US EPA SW Acute LOEL	
Trichloroethene (TCE)	2.4E-01	2.0E+02	10% US EPA SW Acute LOEL	
Vinyl Chloride	4.3E-01	--	--	
Xylenes, Total	1.1E+00	1.0E+02	5% acute SW LC 50	
TPH-Gasoline (C4-C12)	6.0E+01	3.7E+03	Basin Plan	
TPH-Diesel (C10-C28)	2.6E+03	6.4E+02	Basin Plan	
TPH-Motor Oil (C24-C36)	1.2E+03	--	--	

Notes and Abbreviations:

1. The 95% UCL or the maximum detected concentration is presented, whichever is lower.

2. California Regional Water Quality Control Board, San Francisco Bay Region, January 2019, Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater, Table GW-2, Aquatic Habitat Screening Levels (SLs; lowest marine aquatic habitat goal).

3. Comparison of the 95% UCL and the Marine Aquatic SL x AF of 100, used at Bay Area sites (e.g., Mission Bay and San Francisco Airport).

UCL = upper confidence limit

CCC = criterion for continuous concentration

CTR = California Toxics Rule (in RWQCBCV 2000 and Federal Register 2000)

LOEL = lowest observed effect level

BC SQuiRTs = British Columbia Water Quality Guidelines in Screening Quick Reference Table (SQuiRTs) for Invorganics in Water

NZ SQuiRTs = Australian and New Zealand ECLs and Trigger Values in Screening Quick Reference Table (SQuiRTs) for Invorganics in Water

SQuiRTs = Buchman, M.F., 2008. National Oceanic and Atmospheric Adminstration (NOAA) Screening Quick Reference Tables

SW = saltwater

US EPA = U.S Environmental Protection Agency

San Francisco Bay Region (Region 2) Water Quality Control Plan (Basin Plan), March 4, 2017

-- = not available

TABLE 21b

COMPARISON OF EXPOSURE POINT CONCENTRATIONS IN AREA OF HVOC PLUME TO GROUNDWATER SCREENING LEVELS FOR THE PROTECTION OF AQUATIC RECEPTORS

Brisbane Baylands OU2

Brisbane, California

Analyte	Maximum[1] µg/L	Marine Aquatic SL[2] µg/L	Basis	Maximum > Marine Aquatic SL x AF 100 ?
Volatile Organic Compounds				
cis-1,2-Dichloroethene	1.9E+05	2.2E+04	10% US EPA SW Acute LOEL	
Ethylbenzene	1.7E+01	4.3E+01	10% US EPA SW Acute LOEL	
Tetrachloroethene (PCE)	4.3E+04	2.3E+02	50% US EPA SW Chronic LOEL	Yes
Toluene	2.7E+00	2.5E+03	50% US EPA SW Chronic LOEL	
trans-1,2-Dichloroethene	3.7E+03	2.2E+04	10% US EPA SW Acute LOEL	
Trichloroethene (TCE)	1.3E+04	2.0E+02	10% US EPA SW Acute LOEL	
Vinyl Chloride	6.5E+04	--	--	
Xylenes, Total	1.5E+01	1.0E+02	5% acute SW LC 50	

Notes and Abbreviations:

1. The maximum detected concentration is presented.

2. California Regional Water Quality Control Board, San Francisco Bay Region, January 2019, Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater, Table GW-2, Aquatic Habitat Screening Levels (SLs; lowest marine aquatic habitat goal).

3. Comparison of the Maximum and the Marine Aquatic SL x AF of 100, used at Bay Area sites (e.g., Mission Bay and San Francisco Airport).

LOEL = lowest observed effect level

SW = saltwater

US EPA = U.S Environmental Protection Agency

-- = not available

FIGURES



Site Location Map

Brisbane Baylands OU2
Brisbane, California

Geosyntec consultants

WG2556	July 2019

Figure 1

D:\GIS\UPC\Brisbane\Project\2018_DataGapAnalysis - OU2\Fig01_SiteLocation_OU2.mxd



Legend

Sample Location and Soil Analyses
- Metals
- Metals, VOCs, SVOCs, PCBs, OCPs, TPH, Asbestos
- Historical Sample Location
- Monitoring Well Location
- Piezometer Location

- Drainage Ditch
- Sampling Zone
- Wetlands
- Approximate Former Oil Tank Location
- Approximate Former Underground Storage Tank (UST) Location
- Property Boundary
- Railroad Tracks
- Current/Former Building Footprint

Note:
- All locations are approximate

N

0 260 Feet

Soil Sample Locations

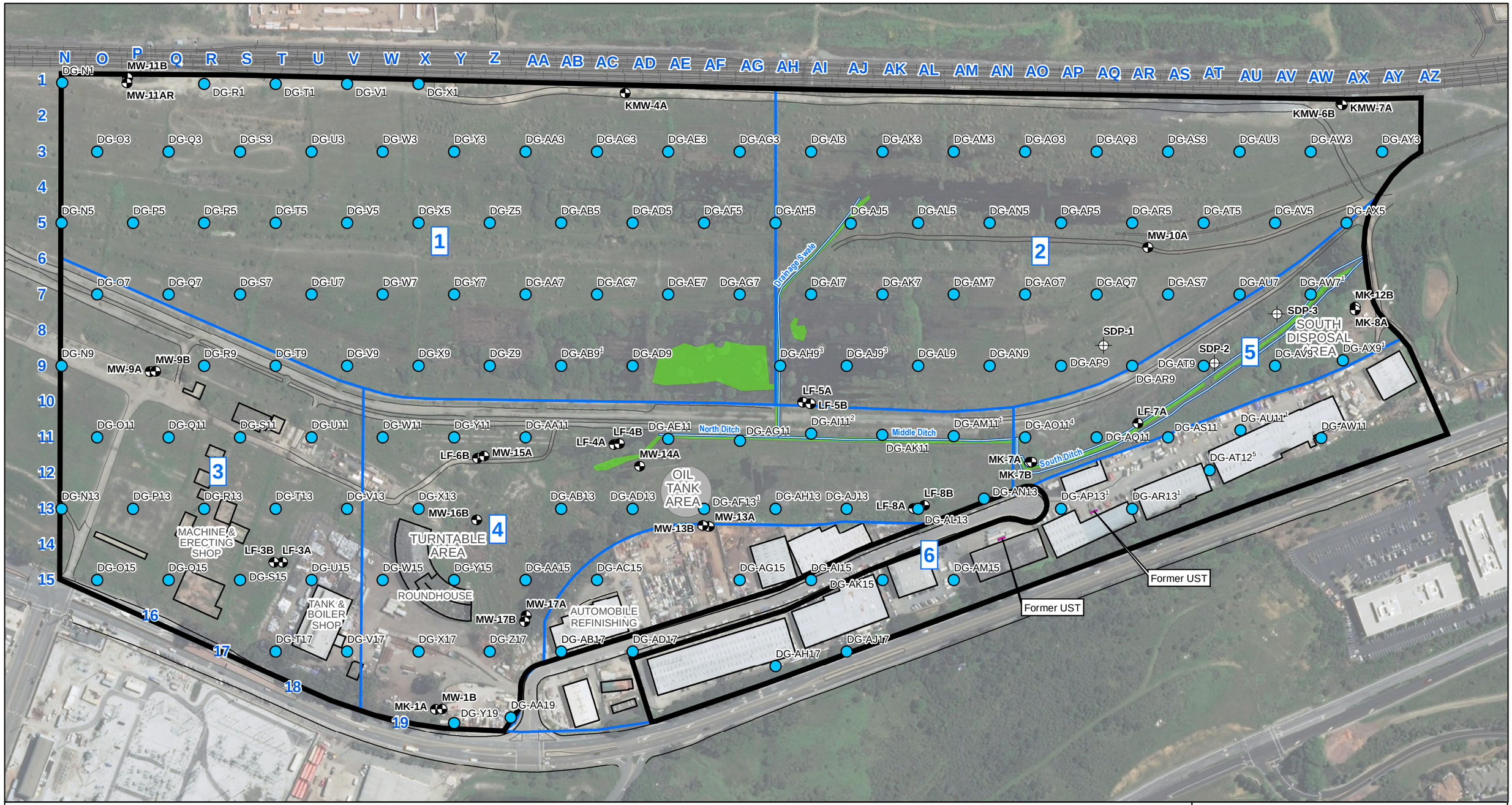
Brisbane Baylands OU-2
Brisbane, California

Geosyntec consultants

WG2619 | July 2019

Figure 2

D:\GIS\UPC\Brisbane\Project\2019_OU2_SM\Fig03_SoilSampleLocations.mxd



Legend

- Grab Groundwater Sample Location
- Monitoring Well Location
- Piezometer Location
- Drainage Ditch
- Sampling Zone
- Wetlands
- Approximate Former Oil Tank Location
- Approximate Former Underground Storage Tank (UST) Location
- Property Boundary
- Railroad Tracks
- Current/Former Building Footprint

Notes:
[1] Well was dry or had low recharge. A sample was not attempted.
[2] Tar found in well.
[3] Standing water found in well.
[4] Only sampled for VOCs due to low recharge.
[5] Well found dry.
VOCs = volatile organic compounds
All locations are approximate.

N

0 260 Feet

Groundwater Sample Locations

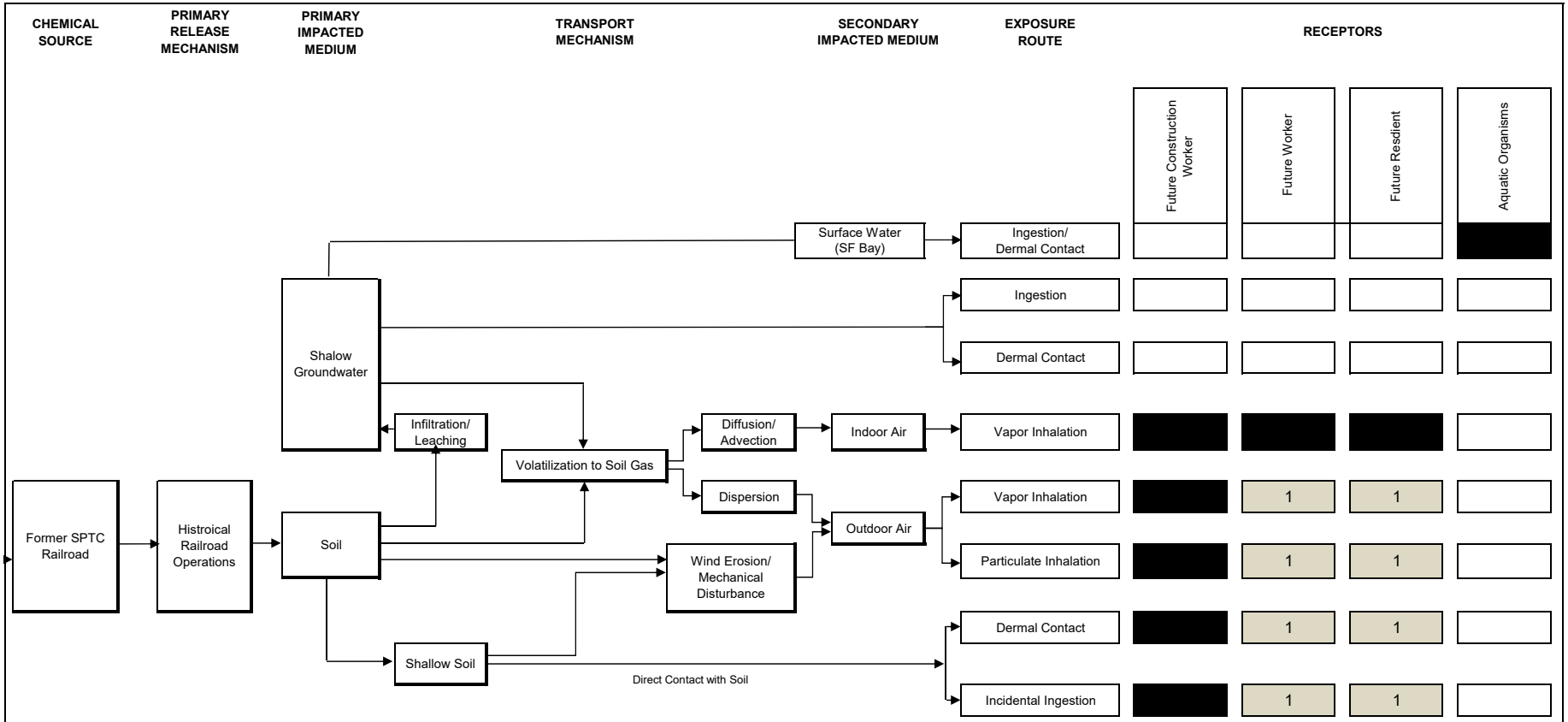
Brisbane Baylands OU-2
Brisbane, California

Geosyntec consultants

WG2619 | July 2019

Figure 3

D:\GIS\UPC\Brisbane\Project\2019_OU2_SM\Fig04_GWSampleLocations.mxd



NOTES:

Potentially complete exposure pathway

1 Under future conditions, the site will be paved and covered by buildings and pavement; therefore pathway is incomplete. However, pathway is evaluated in the HHRA.

Incomplete exposure pathway

Conceptual Site Model
Brisbane Baylands OU2
Brisbane, California

Geosyntec consultants

WG2556 | August 2019

Figure 4

APPENDIX A-1

Analytical Summary of Soil and Groundwater Data in Area of HVOC Plume

APPENDIX A-1 TABLE 1A
VOCs Analytical Results in Shallow Soil
UPC OU-2
Brisbane, California

Sample Location	C-34	C-35	C-36	C-37	*C-38*	C-39
Sample Date	8/30/06	8/30/06	8/30/06	8/30/06	*8/30/06*	8/30/06
Sample Depth (ft bgs)	3-4	4.5-5	6-6.5	4.5-5	*4.5-5*	3.5-4
VOCs (µg/kg)						
1,1,1-Trichloroethane	<5	<500	<2,500	<25	*<25,000*	<250,000
1,1,2-Trichloroethane	<5	<500	<2,500	<25	*<25,000*	<250,000
1,1-Dichloroethane	<5	<500	<2,500	<25	*<25,000*	<250,000
1,1-Dichloroethene	<5	<500	<2,500	<25	*<25,000*	<250,000
1,2-Dichloroethane	<5	<500	<2,500	<25	*<25,000*	<250,000
Acetone	<100	<10,000	<50,000	<500	*<500,000*	<5,000,000
Benzene	<5	<500	<2,500	<25	*<25,000*	<250,000
Chloroform	7.7	<500	<2,500	<25	*<25,000*	<250,000
cis-1,2-Dichloroethene	<5	3,200	27,000	830	*490,000*	460,000 J
Ethylbenzene	<5	<500	<2,500	<25	*<25,000*	<250,000
Methylene Chloride	<5	<500	<2,500	<120	*<120,000*	<1,300,000
Tetrachloroethene	15	<500	4,400	<25	*310,000*	4,200,000 J
Trichloroethene	<5	<500	<2,500	<25	*40,000*	<250,000
Toluene	<5	<500	<2,500	<25	*<25,000*	<250,000
trans-1,2-Dichloroethene	<5	<500	<2,500	160	*<25,000*	<250,000
Vinyl Chloride	<5	2,300	<2,500	84	*<25,000*	<250,000
Total Xylenes	<10	<1,000	<5,000	<50	*<50,000*	<500,000

Notes and Abbreviations:

Samples collected by Burns & McDonnell, OU-2 Additional Investigation in the area of the HVOC Plume. February 2007. Italicized results indicate sample collected below the water table.

ft bgs = feet below ground
VOCs = Volatile Organic Compounds VOCs Analyzed by EPA Method 8260B
µg/kg = micrograms per kilogram
<5 = Not detected above the laboratroy reporting limit shown
J - Elevated Surrogate Recovery - indicates potential bias.

APPENDIX A-1 TABLE 1B
VOCs Analytical Results in Deep Soil
UPC OU-2
Brisbane, California

Sample Location	C-34	*C-35*	*C-36*	*C-37*	*C-38*	C-39
Sample Date	8/30/06	*8/30/06*	*8/30/06*	*8/30/06*	*8/30/06*	8/30/06
Sample Depth (ft bgs)	7.5-8	*5.5-6*	*8-8.5*	*6.5-7*	*5.5-6*	4.5-5
VOCs (µg/kg)						
1,1,1-Trichloroethane	<5	*<2,500*	*<2,500*	*<500*	*<2,500*	<250,000
1,1,2-Trichloroethane	<5	*<2,500*	*<2,500*	*<500*	*<2,500*	<250,000
1,1-Dichloroethane	<5	*<2,500*	*<2,500*	*<500*	*<2,500*	<250,000
1,1-Dichloroethene	<5	*<2,500*	*<2,500*	*<500*	*<2,500*	<250,000
1,2-Dichloroethane	<5	*<2,500*	*<2,500*	*<500*	*<2,500*	<250,000
Acetone	<100	*<50,000*	*<50,000*	*<10,000*	*<50,000*	<5,000,000
Benzene	<5	*<2,500*	*<2,500*	*<500*	*<2,500*	<250,000
Chloroform	7.7	*<2,500*	*<2,500*	*<500*	*<2,500*	<250,000
cis-1,2-Dichloroethene	<5	*<2,500*	*12,000*	*630*	*80,000*	960,000
Ethylbenzene	5.3	*<2,500*	*<2,500*	*<500*	*<2,500*	<250,000
Methylene Chloride	<50	*<2,500*	*<2,500*	*<2,500*	*<2,500*	<1,300,000
Tetrachloroethene	<5	*<2,500*	*4,400*	*20,000*	*21,000*	9,400,000
Trichloroethene	<5	*<2,500*	*<2,500*	*930*	*<2,500*	860,000
Toluene	<5	*<2,500*	*<2,500*	*<500*	*<2,500*	<250,000
trans-1,2-Dichloroethene	<5	*<2,500*	*2,800*	*<500*	*<2,500*	<250,000
Vinyl Chloride	<5	*<2,500*	*<2,500*	*<500*	*3,100*	<250,000
Total Xylenes	31	*<5,000*	*7,100*	*<1,000*	*<5,000*	<500,000

Notes and Abbreviations:

Samples collected by Burns & McDonnell, OU-2 Additional Investigation in the area of the HVOC Plume. February 2007. Italicized results indicate sample collected below the water table.

ft bgs = feet below ground
VOCs = Volatile Organic Compounds VOCs Analyzed by EPA Method 8260B
µg/kg = micrograms per kilogram
<5 = Not detected above the laboratroy reporting limit shown
J - Elevated Surrogate Recovery - indicates potential bias.

APPENDIX A-1 TABLE 2A
VOCs Analytical Results in Shallow Groundwater
UPC OU-2
Brisbane, California

Sample Location	C-34	C-35	C-36	C-37	C-38	C-39
Sample Date	8/30/06	8/30/06	8/30/06	8/30/06	8/30/06	8/30/06
VOCs (µg/L)						
1,1,1-Trichloroethane	<0.5	<0.5	<1,200	<250	<1,000	<500
1,1-Dichloroethane	<0.5	<0.5	<1,200	<250	<1,000	<500
1,1-Dichloroethene	<0.5	<0.5	<1,200	<250	<1,000	<500
1,2-Dichloroethane	<0.5	<0.5	<1,200	<250	<1,000	<500
Acetone	<0.5	<20	<50,000	<10,000	<40,000	<20,000
Carbon Disulfide	<0.5	<0.5	<1,200	<250	<1,000	<500
Chloroform	<0.5	<0.5	<1,200	<250	<1,000	<500
Cis-1,2-Dichloroethene	<0.5	30	150,000	23,000	110,000	91,000
Ethylbenzene	0.6	31	<1,200	<250	<1,000	<500
Tetrachloroethene	<0.5	2.4	79,000	500	7,900	20,000
Trichloroethene	<0.5	1.1	15,000	<250	1,300	2,800
Toluene	0.62	0.67	<1200	<250	<1,000	<500
Trans-1,2-dichloroethene	<0.5	0.67	2,800	<250	<1,000	<500
Vinyl Chloride	<0.5	4.3	49,000	7,400	14,000	2,500
Total Xylenes	6.1	13	<1,200	<250	<1,000	<500

Notes and Abbreviations:
Samples collected by Burns & McDonnell, OU-2 Additional Investigation in the area of the HVOC Plume. February 2007.
VOCs = VOCs Analyzed by EPA Method 5030C/8260B
µg/L = micrograms per liter
<0.5 = Not detected above the laboratroy reporting limit shown

APPENDIX A-1 TABLE 2B
VOCs Analytical Results in Deep Groundwater
UPC OU-2
Brisbane, California

Sample Location	C-34	C-35	C-36	C-37	C-38	C-39
Sample Date	8/30/06	8/30/06	8/30/06	8/30/06	8/30/06	8/30/06
VOCs (µg/L)						
1,1,1-Trichloroethane	<0.5	<0.5	<2,500	<250	<1,000	<1,000
1,1-Dichloroethane	<0.5	<0.5	<2,500	<250	<1,000	<1,000
1,1-Dichloroethene	<0.5	<0.5	<2,500	<250	<1,000	<1,000
1,2-Dichloroethane	<0.5	<0.5	<2,500	<250	<1,000	<1,000
Acetone	<0.5	<0.5	<100,000	<10,000	<40,000	<40,000
Carbon Disulfide	<0.5	<0.5	<2,500	<250	<1,000	<1,000
Chloroform	<0.5	<0.5	<2,500	<250	<1,000	<1,000
Cis-1,2-Dichloroethene	<0.5	25	230,000	23,000	85,000	140,000
Ethylbenzene	0.7	3	<2,500	<250	<1,000	<1,000
Tetrachloroethene	<0.5	1.1	7,600	730	12,000	26,000
Trichloroethene	<0.5	0.7	11,000	<250	2,100	5,500
Toluene	0.80	4.70	<2,500	<250	<1,000	<1,000
Trans-1,2-dichloroethene	<0.5	0.63	4,600	<250	<1,000	<1,000
Vinyl Chloride	<0.5	4.5	80,000	17,000	11,000	11,000
Total Xylenes	8.1	16	<2,500	<250	<1,000	<1,000

Notes and Abbreviations:
Samples collected by Burns & McDonnell, OU-2 Additional Investigation in the area of the HVOC Plume. February 2007.
VOCs = VOCs Analyzed by EPA Method 5030C/8260B
µg/L = micrograms per liter
<0.5 = Not detected above the laboratroy reporting limit shown

COPYRIGHT © 2006 BURNS AND MCDONNELL ENGINEERING COMPANY, INC.

LANDFILL AREA

SAN FRANCISCO COUNTY

SAN MATEO COUNTY

CALTRAIN TRACKS

OU-1
NORTH AREA

OU-2
SOUTH AREA

BAYSHORE BOULEVARD

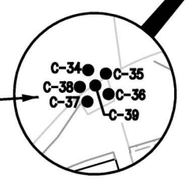
MACDONALD AVENUE

GENEVA AVENUE

INDUSTRIAL WAY

BAYSHORE BOULEVARD

ADDITIONAL 6 BORINGS



N

500' 0' 500' 1000'

SCALE IN FEET

Burns & McDonnell
SINCE 1898

Figure 1

SITE MAP - OU-2
HVOC PLUME, 6 ADDITIONAL BORINGS - AUGUST 2006
SUNQUEST PROPERTIES, INC.
BRISBANE, CALIFORNIA

UNIV-42983-OU2-FIG1.DGN /12-13-2 K:\SUNQUEST\USTN\42983\

COPYRIGHT © 2006 BURNS AND MCDONNELL ENGINEERING COMPANY, INC.

FORMER OIL TANK

FORMER TURNTABLE

FORMER DIESEL LINE

C-34 C-35 C-39 C-38 C-36 C-37

ROUNDHOUSE

INDUSTRIAL WAY

LEGEND

C-35● BORING LOCATION (APPROXIMATE)

EXISTING STRUCTURE

FORMER STRUCTURE

CHAIN LINK FENCE

N

60' 0' 60' 120'

SCALE IN FEET

Burns & McDonnell SINCE 1898

Figure 2

BORING LOCATIONS - OU-2 HVOC PLUME, 6 ADDITIONAL BORINGS - AUGUST 2006 SUNQUEST PROPERTIES, INC. BRISBANE, CALIFORNIA

K:\SUNQUEST\USTIN\42983\

UNIV-42983-OU2-FIG2.DGN /12-04-2

APPENDIX A-2
Analytical Summary of Soil and Groundwater Data

Table 1a: Soil and Grab Groundwater Sampling Matrix

Brisbane OU-2
Brisbane, California

Boring ID	Grid Node (Figure 3)		Soil Sample Depth (feet bgs)	Soil Analyses							Grab Groundwater Analyses				
	Ordinate	Abscissa		VOCs & GRO (8260B)	SVOCs - PAHs (8270-SIM)	TPH - Diesel/Motor Oil (8015B)	CAM-17 Metals (6010 B, 7471)	OCPs (8081A)	PCBs (8082)	Asbestos (CARB 435)	VOCs + GRO (8260B)	SVOCs (EPA 8270C)	CAM-17 Metals (6010B, 7471)	CrVI (7196)	TPH Diesel/Motor Oil (8015B)
Zone 1 - Former Switching Yard (North)															
DG-N1	N	1	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			9.5-10*	O	O	O	O	O	O	O	X	X	X	X	X
DG-O1	O	1	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-P1	P	1	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			9.5-10*	O	O	O	O	O	O	O	--	--	--	--	--
DG-Q1	Q	1	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-R1	R	1	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			9.5-10*	O	O	O	O	O	O	O	X	X	X	X	X
DG-S1	S	1	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-T1	T	1	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			9.5-10*	O	O	O	O	O	O	O	X	X	X	X	X
DG-U1	U	1	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-V1	V	1	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			9.5-10*	O	O	O	O	O	O	O	X	X	X	X	X
DG-W1	W	1	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-X1	X	1	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			9.5-10*	O	O	O	O	O	O	O	X	X	X	X	X
DG-Y1	Y	1	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-N2	N	2	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-O2	O	2	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-P2	P	2	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-Q2	Q	2	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-R2	R	2	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-S2	S	2	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-T2	T	2	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-U2	U	2	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-V2	V	2	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-W2	W	2	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-X2	X	2	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-Y2	Y	2	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-Z2	Z	2	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AA2	AA	2	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AB2	AB	2	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AC2	AC	2	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AD2	AD	2	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AE2	AE	2	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AF2	AF	2	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AG2	AG	2	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-N3	N	3	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--

Table 1a: Soil and Grab Groundwater Sampling Matrix

Brisbane OU-2
Brisbane, California

Boring ID	Grid Node (Figure 3)		Soil Sample Depth (feet bgs)	Soil Analyses							Grab Groundwater Analyses				
	Ordinate	Abscissa		VOCs & GRO (8260B)	SVOCs - PAHs (8270-SIM)	TPH - Diesel/Motor Oil (8015B)	CAM-17 Metals (6010 B, 7471)	OCPs (8081A)	PCBs (8082)	Asbestos (CARB 435)	VOCs + GRO (8260B)	SVOCs (EPA 8270C)	CAM-17 Metals (6010B, 7471)	CrVI (7196)	TPH Diesel/Motor Oil (8015B)
Zone 1 - Former Switching Yard (North)															
DG-O3	O	3	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			9.5-10*	O	O	O	O	O	O	O	X	X	X	X	X
DG-P3	P	3	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-Q3	Q	3	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			9.5-10*	O	O	O	O	O	O	O	O	O	O	O	O
DG-R3	R	3	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-S3	S	3	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			9.5-10*	O	O	O	O	O	O	O	X	X	X	X	X
DG-T3	T	3	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-U3	U	3	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			9.5-10*	O	O	O	O	O	O	O	X	X	X	X	X
DG-V3	V	3	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-W3	W	3	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			9.5-10*	O	O	O	O	O	O	O	X	X	X	X	X
DG-X3	X	3	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-Y3	Y	3	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			9.5-10*	O	O	O	O	O	O	O	X	X	X	X	X
DG-Z3	Z	3	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AA3	AA	3	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			7-7.5	X	X	X	X	X	X	X	X	X	X	X	X
DG-AB3	AB	3	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AC3	AC	3	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			9.5-10*	O	O	O	O	O	O	O	X	X	X	X	X
DG-AD3	AD	3	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AE3	AE	3	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			9.5-10*	O	O	O	O	O	O	O	X	X	X	X	X
DG-AF3	AF	3	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AG3	AG	3	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			9.5-10*	O	O	O	O	O	O	O	X	X	X	X	X
DG-N4	N	4	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-O4	O	4	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-P4	P	4	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-Q4	Q	4	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-R4	R	4	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-S4	S	4	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-T4	T	4	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-U4	U	4	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-V4	V	4	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-W4	W	4	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-X4	X	4	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-Y4	Y	4	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--

Table 1a: Soil and Grab Groundwater Sampling Matrix

Brisbane OU-2
Brisbane, California

Boring ID	Grid Node (Figure 3)		Soil Sample Depth (feet bgs)	Soil Analyses							Grab Groundwater Analyses				
	Ordinate	Abscissa		VOCs & GRO (8260B)	SVOCs - PAHs (8270-SIM)	TPH - Diesel/Motor Oil (8015B)	CAM-17 Metals (6010 B, 7471)	OCPs (8081A)	PCBs (8082)	Asbestos (CARB 435)	VOCs + GRO (8260B)	SVOCs (EPA 8270C)	CAM-17 Metals (6010B, 7471)	CrVI (7196)	TPH Diesel/Motor Oil (8015B)
Zone 1 - Former Switching Yard (North)															
DG-Z4	Z	4	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AA4	AA	4	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AB4	AB	4	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AC4	AC	4	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AD4	AD	4	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AE4	AE	4	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AF4	AF	4	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AG4	AG	4	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-N5	N	5	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			9.5-10*	O	O	O	O	O	O	O	X	X	X	X	X
DG-O5	O	5	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-P5	P	5	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			9.5-10*	O	O	O	O	O	O	O	X	X	X	X	X
DG-Q5	Q	5	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-R5	R	5	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			9.5-10*	O	O	O	O	O	O	O	X	X	X	X	X
DG-S5	S	5	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-T5	T	5	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			9.5-10*	O	O	O	O	O	O	O	X	X	X	X	X
DG-U5	U	5	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-V5	V	5	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			7.5-8	X	X	X	X	X	X	X	X	X	X	X	X
DG-W5	W	5	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-X5	X	5	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			9.5-10*	X	X	X	X	X	X	X	X	X	X	X	X
DG-Y5	Y	5	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-Z5	Z	5	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			9.5-10*	X	X	X	X	X	X	X	X	X	X	X	X
DG-AA5	AA	5	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AB5	AB	5	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			9.5-10*	O	O	O	O	O	O	O	X	X	X	X	X
DG-AC5	AC	5	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AD5	AD	5	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			9.5-10*	X	X	X	X	X	X	X	X	X	X	X	X
DG-AE5	AE	5	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AF5	AF	5	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			9.5-10*	O	O	O	O	O	O	O	X	X	X	X	X
DG-AG5	AG	5	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-O6	O	6	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-P6	P	6	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-Q6	Q	6	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--

Table 1a: Soil and Grab Groundwater Sampling Matrix

Brisbane OU-2
Brisbane, California

Boring ID	Grid Node (Figure 3)		Soil Sample Depth (feet bgs)	Soil Analyses							Grab Groundwater Analyses				
	Ordinate	Abscissa		VOCs & GRO (8260B)	SVOCs - PAHs (8270-SIM)	TPH - Diesel/Motor Oil (8015B)	CAM-17 Metals (6010 B, 7471)	OCPs (8081A)	PCBs (8082)	Asbestos (CARB 435)	VOCs + GRO (8260B)	SVOCs (EPA 8270C)	CAM-17 Metals (6010B, 7471)	CrVI (7196)	TPH Diesel/Motor Oil (8015B)
Zone 1 - Former Switching Yard (North)															
DG-R6	R	6	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-S6	S	6	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-T6	T	6	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-U6	U	6	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-V6	V	6	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-W6	W	6	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-X6	X	6	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-Y6	Y	6	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-Z6	Z	6	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AA6	AA	6	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AB6	AB	6	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AC6	AC	6	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AD6	AD	6	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AE6	AE	6	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AF6	AF	6	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AG6	AG	6	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-Q7	Q	7	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			9.5-10*	O	O	O	O	O	O	O	X	X	X	X	X
DG-R7	R	7	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-S7	S	7	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			9.5-10*	O	O	O	O	O	O	O	X	X	X	X	X
DG-T7	T	7	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-U7	U	7	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			9.5-10*	O	O	O	O	O	O	O	X	X	X	X	X
DG-V7	V	7	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-W7	W	7	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			9.5-10*	O	O	O	O	O	O	O	X	X	X	X	X
DG-X7	X	7	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-Y7	Y	7	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			9.5-10*	O	O	O	O	O	O	O	X	X	X	X	X
DG-Z7	Z	7	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AA7	AA	7	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			9.5-10*	O	O	O	O	O	O	O	X	X	X	X	X
DG-AB7	AB	7	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AC7	AC	7	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			7.5-8	X	X	X	X	X	X	X	X	X	X	X	X
DG-AD7	AD	7	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AE7	AE	7	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			8-8.5	X	X	X	X	X	X	X	X	X	X	X	X
DG-AF7	AF	7	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--

Table 1a: Soil and Grab Groundwater Sampling Matrix

Brisbane OU-2
Brisbane, California

Boring ID	Grid Node (Figure 3)		Soil Sample Depth (feet bgs)	Soil Analyses							Grab Groundwater Analyses				
	Ordinate	Abscissa		VOCs & GRO (8260B)	SVOCs - PAHs (8270-SIM)	TPH - Diesel/Motor Oil (8015B)	CAM-17 Metals (6010 B, 7471)	OCPs (8081A)	PCBs (8082)	Asbestos (CARB 435)	VOCs + GRO (8260B)	SVOCs (EPA 8270C)	CAM-17 Metals (6010B, 7471)	CrVI (7196)	TPH Diesel/Motor Oil (8015B)
Zone 1 - Former Switching Yard (North)															
DG-AG7	AG	7	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			9.5-10*	O	O	O	O	O	O	O	X	X	X	X	X
DG-S8	S	8	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-T8	T	8	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-U8	U	8	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-V8	V	8	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-W8	W	8	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-X8	X	8	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-Y8	Y	8	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-Z8	Z	8	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AA8	AA	8	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AB8	AB	8	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AC8	AC	8	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AD8	AD	8	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AE8	AE	8	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AF8	AF	8	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AG8	AG	8	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-U9	U	9	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-V9	V	9	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			7.5-8	X	X	X	X	X	X	X	X	X	X	X	X
DG-W9	W	9	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-X9	X	9	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			9.5-10*	O	O	O	O	O	O	O	X	X	X	X	X
DG-Y9	Y	9	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-Z9	Z	9	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			9.5-10*	O	O	O	O	O	O	O	X	X	X	X	X
DG-AA9	AA	9	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AB9	AB	9	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			9.5-10*	O	O	O	O	O	O	O	O	O	O	O	O
DG-AC9	AC	9	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AD9	AD	9	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			9.5-10*	O	O	O	O	O	O	O	X	X	X	X	X
DG-AF10	AF	10	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AG10	AG	10	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
Field Sample Total				**88**	**88**	**88**	**318**	**88**	**88**	**88**	**37**	**37**	**37**	**37**	**37**
Field Duplicates/Splits (10%)				9	9	9	32	9	9	9	4	4	4	4	4
Matrix Spikes (5%)				5	5	5	16	5	5	5	2	2	2	2	2
Field Blanks (1 per day)				0	0	0	0	0	0	0	0	0	0	0	0
Trip Blanks (1 per day)				0	0	0	0	0	0	0	0	0	0	0	0
Grand Total				**102**	**102**	**102**	**366**	**102**	**102**	**102**	**43**	**43**	**43**	**43**	**43**

Table 1a: Soil and Grab Groundwater Sampling Matrix

Brisbane OU-2
Brisbane, California

Boring ID	Grid Node (Figure 3)		Soil Sample Depth (feet bgs)	Soil Analyses							Grab Groundwater Analyses				
	Ordinate	Abscissa		VOCs & GRO (8260B)	SVOCs - PAHs (8270-SIM)	TPH - Diesel/Motor Oil (8015B)	CAM-17 Metals (6010 B, 7471)	OCPs (8081A)	PCBs (8082)	Asbestos (CARB 435)	VOCs + GRO (8260B)	SVOCs (EPA 8270C)	CAM-17 Metals (6010B, 7471)	CrVI (7196)	TPH Diesel/Motor Oil (8015B)
Zone 2 - Former Switching Yard (South)															
DG-AH2	AH	2	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AI2	AI	2	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AJ2	AJ	2	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AK2	AK	2	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AL2	AL	2	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AM2	AM	2	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AN2	AN	2	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AO2	AO	2	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AP2	AP	2	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AQ2	AQ	2	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AR2	AR	2	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AS2	AS	2	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AT2	AT	2	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AU2	AU	2	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AV2	AV	2	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AW2	AW	2	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AX2	AX	2	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AY2	AY	2	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AZ2	AZ	2	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AH3	AH	3	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AI3	AI	3	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			9.5-10*	O	O	O	O	O	O	O	X	X	X	X	X
DG-AJ3	AJ	3	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AK3	AK	3	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			9.5-10*	O	O	O	O	O	O	O	X	X	X	X	X
DG-AL3	AL	3	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AM3	AM	3	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			9.5-10*	O	O	O	O	O	O	O	X	X	X	X	X
DG-AN3	AN	3	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AO3	AO	3	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			9.5-10*	O	O	O	O	O	O	O	X	X	X	X	X
DG-AP3	AP	3	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AQ3	AQ	3	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			9.5-10*	O	O	O	O	O	O	O	X	X	X	X	X
DG-AR3	AR	3	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AS3	AS	3	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			4.5-5	X	X	X	X	X	X	X	X	X	X	X	X

Table 1a: Soil and Grab Groundwater Sampling Matrix

Brisbane OU-2
Brisbane, California

Boring ID	Grid Node (Figure 3)		Soil Sample Depth (feet bgs)	Soil Analyses							Grab Groundwater Analyses				
	Ordinate	Abscissa		VOCs & GRO (8260B)	SVOCs - PAHs (8270-SIM)	TPH - Diesel/Motor Oil (8015B)	CAM-17 Metals (6010 B, 7471)	OCPs (8081A)	PCBs (8082)	Asbestos (CARB 435)	VOCs + GRO (8260B)	SVOCs (EPA 8270C)	CAM-17 Metals (6010B, 7471)	CrVI (7196)	TPH Diesel/Motor Oil (8015B)
Zone 2 - Former Switching Yard (South)															
DG-AT3	AT	3	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AU3	AU	3	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			9.5-10*	O	O	O	O	O	O	O	X	X	X	X	X
DG-AV3	AV	3	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AW3	AW	3	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			9.5-10*	O	O	O	O	O	O	O	X	X	X	X	X
DG-AX3	AX	3	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AY3	AY	3	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			9.5-10*	O	O	O	O	O	O	O	X	X	X	X	X
DG-AZ3	AZ	3	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AH4	AH	4	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AI4	AI	4	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AJ4	AJ	4	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AK4	AK	4	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AL4	AL	4	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AM4	AM	4	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AN4	AN	4	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AO4	AO	4	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AP4	AP	4	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AQ4	AQ	4	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AR4	AR	4	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AS4	AS	4	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AT4	AT	4	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AU4	AU	4	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AV4	AV	4	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AW4	AW	4	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AX4	AX	4	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AY4	AY	4	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AH5	AH	5	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			8-8.5	X	X	X	X	X	X	X	X	X	X	X	X
DG-AI5	AI	5	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AJ5	AJ	5	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			9.5-10*	O	O	O	O	O	O	O	X	X	X	X	X
DG-AK5	AK	5	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AL5	AL	5	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			9.5-10*	O	O	O	O	O	O	O	X	X	X	X	X
DG-AM5	AM	5	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--

Table 1a: Soil and Grab Groundwater Sampling Matrix

Brisbane OU-2
Brisbane, California

Boring ID	Grid Node (Figure 3)		Soil Sample Depth (feet bgs)	Soil Analyses							Grab Groundwater Analyses				
	Ordinate	Abscissa		VOCs & GRO (8260B)	SVOCs - PAHs (8270-SIM)	TPH - Diesel/Motor Oil (8015B)	CAM-17 Metals (6010 B, 7471)	OCPs (8081A)	PCBs (8082)	Asbestos (CARB 435)	VOCs + GRO (8260B)	SVOCs (EPA 8270C)	CAM-17 Metals (6010B, 7471)	CrVI (7196)	TPH Diesel/Motor Oil (8015B)
Zone 2 - Former Switching Yard (South)															
DG-AN5	AN	5	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			9.5-10*	O	O	O	O	O	O	O	X	X	X	X	X
DG-AO5	AO	5	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AP5	AP	5	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			9.5-10*	O	O	O	O	O	O	O	X	X	X	X	X
DG-AQ5	AQ	5	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AR5	AR	5	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			9.5-10*	O	O	O	O	O	O	O	X	X	X	X	X
DG-AS5	AS	5	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AT5	AT	5	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			9.5-10*	O	O	O	O	O	O	O	X	X	X	X	X
DG-AU5	AU	5	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AV5	AV	5	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			7.5-8	X	X	X	X	X	X	X	X	X	X	X	X
DG-AW5	AW	5	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AH6	AH	6	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AI6	AI	6	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AJ6	AJ	6	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AK6	AK	6	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AL6	AL	6	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AM6	AM	6	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AN6	AN	6	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AO6	AO	6	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AP6	AP	6	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AQ6	AQ	6	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AR6	AR	6	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AS6	AS	6	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AT6	AT	6	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AU6	AU	6	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AV6	AV	6	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AH7	AH	7	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AI7	AI	7	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			8-8.5	X	X	X	X	X	X	X	X	X	X	X	X
DG-AJ7	AJ	7	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AK7	AK	7	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			9.5-10*	O	O	O	O	O	O	O	X	X	X	X	X
DG-AL7	AL	7	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--

Table 1a: Soil and Grab Groundwater Sampling Matrix

Brisbane OU-2
Brisbane, California

Boring ID	Grid Node (Figure 3)		Soil Sample Depth (feet bgs)	Soil Analyses							Grab Groundwater Analyses				
	Ordinate	Abscissa		VOCs & GRO (8260B)	SVOCs - PAHs (8270-SIM)	TPH - Diesel/Motor Oil (8015B)	CAM-17 Metals (6010 B, 7471)	OCPs (8081A)	PCBs (8082)	Asbestos (CARB 435)	VOCs + GRO (8260B)	SVOCs (EPA 8270C)	CAM-17 Metals (6010B, 7471)	CrVI (7196)	TPH Diesel/Motor Oil (8015B)
Zone 2 - Former Switching Yard (South)															
DG-AM7	AM	7	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			7.5-8	X	X	X	X	X	X	X	X	X	X	X	X
DG-AN7	AN	7	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AO7	AO	7	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			9.5-10*	O	O	O	O	O	O	O	X	X	X	X	X
DG-AP7	AP	7	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AQ7	AQ	7	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			9.5-10*	O	O	O	O	O	O	O	X	X	X	X	X
DG-AR7	AR	7	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AS7	AS	7	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			9.5-10*	O	O	O	O	O	O	O	X	X	X	X	X
DG-AT7	AT	7	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AU7	AU	7	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			9.5-10*	O	O	O	O	O	O	O	X	X	X	X	X
DG-AH8	AH	8	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AI8	AI	8	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AJ8	AJ	8	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AK8	AK	8	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AL8	AL	8	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AM8	AM	8	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AN8	AN	8	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AO8	AO	8	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AP8	AP	8	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AQ8	AQ	8	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AR8	AR	8	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AS8	AS	8	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AH9	AH	9	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			9.5-10*	O	O	O	O	O	O	O	O	O	O	O	O
DG-AI9	AI	9	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AJ9	AJ	9	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			9.5-10*	O	O	O	O	O	O	O	O	O	O	O	O
DG-AK9	AK	9	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AL9	AL	9	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			7-7.5	X	X	X	X	X	X	X	X	X	X	X	X
DG-AM9	AM	9	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AN9	AN	9	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			7-7.5	X	X	X	X	X	X	X	X	X	X	X	X
DG-AO9	AO	9	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--

Table 1a: Soil and Grab Groundwater Sampling Matrix

Brisbane OU-2
Brisbane, California

Boring ID	Grid Node (Figure 3)		Soil Sample Depth (feet bgs)	Soil Analyses							Grab Groundwater Analyses				
	Ordinate	Abscissa		VOCs & GRO (8260B)	SVOCs - PAHs (8270-SIM)	TPH - Diesel/Motor Oil (8015B)	CAM-17 Metals (6010 B, 7471)	OCPs (8081A)	PCBs (8082)	Asbestos (CARB 435)	VOCs + GRO (8260B)	SVOCs (EPA 8270C)	CAM-17 Metals (6010B, 7471)	CrVI (7196)	TPH Diesel/Motor Oil (8015B)
Zone 2 - Former Switching Yard (South)															
DG-AP9	AP	9	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			9.5-10*	O	O	O	O	O	O	O	X	X	X	X	X
DG-AQ9	AQ	9	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AR9	AR	9	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			9.5-10*	O	O	O	O	O	O	O	X	X	X	X	X
DG-AH10	AH	10	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AI10	AI	10	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AJ10	AJ	10	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AK10	AK	10	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AL10	AL	10	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AM10	AM	10	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AN10	AN	10	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AO10	AO	10	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
Field Sample Total				**67**	**67**	**67**	**271**	**67**	**67**	**67**	**28**	**28**	**28**	**28**	**28**
Field Duplicates/Splits (10%)				7	7	7	28	7	7	7	3	3	3	3	3
Matrix Spikes (5%)				4	4	4	14	4	4	4	2	2	2	2	2
Equipment Blanks (5%)															
Grand Total				**78**	**78**	**78**	**313**	**78**	**78**	**78**	**33**	**33**	**33**	**33**	**33**

Table 1a: Soil and Grab Groundwater Sampling Matrix

Brisbane OU-2
Brisbane, California

Boring ID	Grid Node (Figure 3)		Soil Sample Depth (feet bgs)	Soil Analyses							Grab Groundwater Analyses				
	Ordinate	Abscissa		VOCs & GRO (8260B)	SVOCs - PAHs (8270-SIM)	TPH - Diesel/Motor Oil (8015B)	CAM-17 Metals (6010 B, 7471)	OCPs (8081A)	PCBs (8082)	Asbestos (CARB 435)	VOCs + GRO (8260B)	SVOCs (EPA 8270C)	CAM-17 Metals (6010B, 7471)	CrVI (7196)	TPH Diesel/Motor Oil (8015B)
Zone 3 - Machine Shop Area															
DG-N6	N	6	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-N7	N	7	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-O7	O	7	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			9.5-10*	O	O	O	O	O	O	O	X	X	X	X	X
DG-P7	P	7	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-N8	N	8	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-O8	O	8	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-P8	P	8	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-Q8	Q	8	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-R8	R	8	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-N9	N	9	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			9.5-10*	O	O	O	O	O	O	O	X	X	X	X	X
DG-O9	O	9	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-P9	P	9	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			9.5-10*	O	O	O	O	O	O	O	--	--	--	--	--
DG-Q9	Q	9	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-R9	R	9	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			9.5-10*	O	O	O	O	O	O	O	X	X	X	X	X
DG-S9	S	9	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-T9	T	9	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			9.5-10*	O	O	O	O	O	O	O	X	X	X	X	X
DG-N10	N	10	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-O10	O	10	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-P10	P	10	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-Q10	Q	10	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-R10	R	10	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-S10	S	10	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-T10	T	10	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-U10	U	10	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-V10	V	10	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-N11	N	11	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-O11	O	11	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			9.5-10*	O	O	O	O	O	O	O	X	X	X	X	X
DG-P11	P	11	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-Q11	Q	11	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			9.5-10*	O	O	O	O	O	O	O	X	X	X	X	X

Table 1a: Soil and Grab Groundwater Sampling Matrix

Brisbane OU-2
Brisbane, California

Boring ID	Grid Node (Figure 3)		Soil Sample Depth (feet bgs)	Soil Analyses							Grab Groundwater Analyses				
	Ordinate	Abscissa		VOCs & GRO (8260B)	SVOCs - PAHs (8270-SIM)	TPH - Diesel/Motor Oil (8015B)	CAM-17 Metals (6010 B, 7471)	OCPs (8081A)	PCBs (8082)	Asbestos (CARB 435)	VOCs + GRO (8260B)	SVOCs (EPA 8270C)	CAM-17 Metals (6010B, 7471)	CrVI (7196)	TPH Diesel/Motor Oil (8015B)
Zone 3 - Machine Shop Area															
DG-R11	R	11	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-S11	S	11	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			9.5-10*	O	O	O	O	O	O	O	X	X	X	X	X
DG-T11	T	11	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-U11	U	11	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			9.5-10*	O	O	O	O	O	O	O	X	X	X	X	X
DG-V11	V	11	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-N12	N	12	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-O12	O	12	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-P12	P	12	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-Q12	Q	12	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-R12	R	12	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-S12	S	12	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-T12	T	12	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-U12	U	12	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-V12	V	12	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-N13	N	13	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			7.5-8	X	X	X	X	X	X	X	X	X	X	X	X
DG-O13	O	13	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-P13	P	13	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			9.5-10*	O	O	O	O	O	O	O	X	X	X	X	X
DG-Q13	Q	13	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-R13	R	13	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			9.5-10*	O	O	O	O	O	O	O	X	X	X	X	X
DG-S13	S	13	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-T13	T	13	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			9.5-10*	O	O	O	O	O	O	O	X	X	X	X	X
DG-U13	U	13	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-V13	V	13	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			7.5-8	X	X	X	X	X	X	X	X	X	X	X	X
DG-N14	N	14	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-O14	O	14	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-P14	P	14	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-Q14	Q	14	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-R14	R	14	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-S14	S	14	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--

Table 1a: Soil and Grab Groundwater Sampling Matrix

Brisbane OU-2
Brisbane, California

Boring ID	Grid Node (Figure 3)		Soil Sample Depth (feet bgs)	Soil Analyses							Grab Groundwater Analyses				
	Ordinate	Abscissa		VOCs & GRO (8260B)	SVOCs - PAHs (8270-SIM)	TPH - Diesel/Motor Oil (8015B)	CAM-17 Metals (6010 B, 7471)	OCPs (8081A)	PCBs (8082)	Asbestos (CARB 435)	VOCs + GRO (8260B)	SVOCs (EPA 8270C)	CAM-17 Metals (6010B, 7471)	CrVI (7196)	TPH Diesel/Motor Oil (8015B)
Zone 3 - Machine Shop Area															
DG-T14	T	14	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-U14	U	14	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-V14	V	14	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-N15	N	15	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-O15	O	15	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			7.5-8	X	X	X	X	X	X	X	X	X	X	X	X
DG-P15	P	15	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-Q15	Q	15	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			7.5-8	X	X	X	X	X	X	X	X	X	X	X	X
DG-R15	R	15	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-S15	S	15	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			6-6.5	X	X	X	X	X	X	X	X	X	X	X	X
DG-T15	T	15	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-U15	U	15	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			8.5-9	X	X	X	X	X	X	X	X	X	X	X	X
DG-V15	V	15	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-Q16	Q	16	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-R16	R	16	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-S16	S	16	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-T16	T	16	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-U16	U	16	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-V16	V	16	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-S17	S	17	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-T17	T	17	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			7-7.5	X	X	X	X	X	X	X	X	X	X	X	X
DG-U17	U	17	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-V17	V	17	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			9.5-10	X	X	X	X	X	X	X	X	X	X	X	X
DG-U18	U	18	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-V18	V	18	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
Field Sample Total				**48**	**48**	**48**	**170**	**48**	**48**	**48**	**19**	**19**	**19**	**19**	**19**
Field Duplicates/Splits (10%)				5	5	5	17	5	5	5	2	2	2	2	2
Matrix Spikes (5%)				3	3	3	9	3	3	3	1	1	1	1	1
Grand Total				**56**	**56**	**56**	**196**	**56**	**56**	**56**	**22**	**22**	**22**	**22**	**22**

Table 1a: Soil and Grab Groundwater Sampling Matrix

Brisbane OU-2
Brisbane, California

Boring ID	Grid Node (Figure 3)		Soil Sample Depth (feet bgs)	Soil Analyses							Grab Groundwater Analyses				
	Ordinate	Abscissa		VOCs & GRO (8260B)	SVOCs - PAHs (8270-SIM)	TPH - Diesel/Motor Oil (8015B)	CAM-17 Metals (6010 B, 7471)	OCPs (8081A)	PCBs (8082)	Asbestos (CARB 435)	VOCs + GRO (8260B)	SVOCs (EPA 8270C)	CAM-17 Metals (6010B, 7471)	CrVI (7196)	TPH Diesel/Motor Oil (8015B)
Zone 4 - Turntable/Oil Tank Area															
DG-W10	W	10	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-X10	X	10	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-Y10	Y	10	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-Z10	Z	10	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AA10	AA	10	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AB10	AB	10	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AC10	AC	10	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AD10	AD	10	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AE10	AE	10	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-W11	W	11	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			9.5-10*	O	O	O	O	O	O	O	X	X	X	X	X
DG-X11	X	11	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-Y11	Y	11	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			9.5-10*	O	O	O	O	O	O	O	X	X	X	X	X
DG-Z11	Z	11	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AA11	AA	11	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			9.5-10*	O	O	O	O	O	O	O	X	X	X	X	X
DG-AB11	AB	11	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AC11	AC	11	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			8.5-9	X	X	X	X	X	X	X	--	--	--	--	--
DG-AD11	AD	11	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AE11	AE	11	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			9.5-10*	X	X	X	X	X	X	X	X	X	X	X	X
DG-AF11	AF	11	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AG11	AG	11	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			9.5-10	X	X	X	X	X	X	X	X	X	X	X	X
DG-AH11	AH	11	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AI11	AI	11	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			9.5-10	X	X	X	X	X	X	X	O	O	O	O	O
DG-AJ11	AJ	11	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AK11	AK	11	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			9.5-10*	O	O	O	O	O	O	O	X	X	X	X	X
DG-AL11	AL	11	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AM11	AM	11	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			9.5-10*	O	O	O	O	O	O	O	O	O	O	O	O
DG-AN11	AN	11	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-W12	W	12	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-X12	X	12	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-Y12	Y	12	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-Z12	Z	12	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AA12	AA	12	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AB12	AB	12	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AC12	AC	12	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--

Table 1a: Soil and Grab Groundwater Sampling Matrix

Brisbane OU-2
Brisbane, California

Boring ID	Grid Node (Figure 3)		Soil Sample Depth (feet bgs)	Soil Analyses							Grab Groundwater Analyses				
	Ordinate	Abscissa		VOCs & GRO (8260B)	SVOCs - PAHs (8270-SIM)	TPH - Diesel/Motor Oil (8015B)	CAM-17 Metals (6010 B, 7471)	OCPs (8081A)	PCBs (8082)	Asbestos (CARB 435)	VOCs + GRO (8260B)	SVOCs (EPA 8270C)	CAM-17 Metals (6010B, 7471)	CrVI (7196)	TPH Diesel/Motor Oil (8015B)
Zone 4 - Turntable/Oil Tank Area															
DG-AD12	AD	12	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AE12	AE	12	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AF12	AF	12	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AG12	AG	12	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AH12	AH	12	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AI12	AI	12	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AJ12	AJ	12	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AK12	AK	12	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AL12	AL	12	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AM12	AM	12	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AN12	AN	12	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-W13	W	13	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-X13	X	13	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			9.5-10*	O	O	O	O	O	O	O	X	X	X	X	X
DG-Y13	Y	13	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-Z13	Z	13	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			9.5-10*	O	O	O	O	O	O	O	--	--	--	--	--
DG-AA13	AA	13	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AB13	AB	13	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			13.5-14	X	X	X	X	X	X	X	X	X	X	X	X
DG-AC13	AC	13	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AD13	AD	13	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			7.5-8	X	X	X	X	X	X	X	X	X	X	X	X
DG-AE13	AE	13	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AF13	AF	13	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			7-7.5	X	X	X	X	X	X	X	O	O	O	O	O
DG-AG13	AG	13	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AH13	AH	13	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			7.5-8	X	X	X	X	X	X	X	X	X	X	X	X
DG-AI13	AI	13	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AJ13	AJ	13	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			9.5-10*	O	O	O	O	O	O	O	X	X	X	X	X
DG-AK13	AK	13	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AL13	AL	13	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			9.5-10*	O	O	O	O	O	O	O	X	X	X	X	X
DG-AM13	AM	13	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-W14	W	14	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-X14	X	14	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-Y14	Y	14	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-Z14	Z	14	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AA14	AA	14	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AB14	AB	14	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--

Table 1a: Soil and Grab Groundwater Sampling Matrix

Brisbane OU-2

Brisbane, California

Boring ID	Grid Node (Figure 3)		Soil Sample Depth (feet bgs)	Soil Analyses							Grab Groundwater Analyses				
	Ordinate	Abscissa		VOCs & GRO (8260B)	SVOCs - PAHs (8270-SIM)	TPH - Diesel/Motor Oil (8015B)	CAM-17 Metals (6010 B, 7471)	OCPs (8081A)	PCBs (8082)	Asbestos (CARB 435)	VOCs + GRO (8260B)	SVOCs (EPA 8270C)	CAM-17 Metals (6010B, 7471)	CrVI (7196)	TPH Diesel/Motor Oil (8015B)
Zone 4 - Turntable/Oil Tank Area															
DG-AC14	AC	14	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AD14	AD	14	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AE14	AE	14	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AF14	AF	14	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AG14	AG	14	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AH14	AH	14	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AI14	AI	14	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AJ14	AJ	14	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AK14	AK	14	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-W15	W	15	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			9.5-10*	O	O	O	O	O	O	O	X	X	X	X	X
DG-X15	X	15	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-Y15	Y	15	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			7.5-8	X	X	X	X	X	X	X	X	X	X	X	X
DG-Z15	Z	15	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AA15	AA	15	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	O	O	O	O	O	O	O	--	--	--	--	--
			9.5-10*	O	O	O	O	O	O	O	X	X	X	X	X
DG-AB15	AB	15	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AC15	AC	15	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			7.5-8	X	X	X	X	X	X	X	X	X	X	X	X
DG-AD15	AD	15	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AE15	AE	15	0.5 - 1	O	O	O	O	O	O	O	--	--	--	--	--
			3.5 - 5	O	O	O	O	O	O	O	--	--	--	--	--
			9.5-10*	O	O	O	O	O	O	O	O	O	O	O	O
DG-AF15	AF	15	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AG15	AG	15	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			8.5-9	X	X	X	X	X	X	X	X	X	X	X	X
DG-AH15	AH	15	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-W16	W	16	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-X16	X	16	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-Y16	Y	16	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-Z16	Z	16	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AA16	AA	16	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AB16	AB	16	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AC16	AC	16	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AD16	AD	16	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AE16	AE	16	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-W17	W	17	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-X17	X	17	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			9.5-10*	O	O	O	O	O	O	O	X	X	X	X	X
DG-Y17	Y	17	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-Z17	Z	17	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			7.5-8	X	X	X	X	X	X	X	X	X	X	X	X

Table 1a: Soil and Grab Groundwater Sampling Matrix

Brisbane OU-2
Brisbane, California

Boring ID	Grid Node (Figure 3)		Soil Sample Depth (feet bgs)	Soil Analyses							Grab Groundwater Analyses				
	Ordinate	Abscissa		VOCs & GRO (8260B)	SVOCs - PAHs (8270-SIM)	TPH - Diesel/Motor Oil (8015B)	CAM-17 Metals (6010 B, 7471)	OCPs (8081A)	PCBs (8082)	Asbestos (CARB 435)	VOCs + GRO (8260B)	SVOCs (EPA 8270C)	CAM-17 Metals (6010B, 7471)	CrVI (7196)	TPH Diesel/Motor Oil (8015B)
Zone 4 - Turntable/Oil Tank Area															
DG-AA17	AA	17	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AB17	AB	17	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			9.5-10*	O	O	O	O	O	O	O	X	X	X	X	X
DG-W18	W	18	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-X18	X	18	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-Y18	Y	18	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-Z18	Z	18	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-X19	X	19	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-Y19	Y	19	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			7.5-8	X	X	X	X	X	X	X	X	X	X	X	X
DG-Z19	Z	19	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
Field Sample Total				**64**	**64**	**64**	**232**	**64**	**64**	**64**	**21**	**21**	**21**	**21**	**21**
Field Duplicates/Splits (10%)				7	7	7	24	7	7	7	3	3	3	3	3
Matrix Spikes (5%)				4	4	4	12	4	4	4	2	2	2	2	2
Grand Total				**75**	**75**	**75**	**268**	**75**	**75**	**75**	**26**	**26**	**26**	**26**	**26**

Table 1a: Soil and Grab Groundwater Sampling Matrix
Brisbane OU-2
Brisbane, California

Boring ID	Grid Node (Figure 3)		Soil Sample Depth (feet bgs)	Soil Analyses							Grab Groundwater Analyses				
	Ordinate	Abscissa		VOCs & GRO (8260B)	SVOCs - PAHs (8270-SIM)	TPH - Diesel/Motor Oil (8015B)	CAM-17 Metals (6010 B, 7471)	OCPs (8081A)	PCBs (8082)	Asbestos (CARB 435)	VOCs + GRO (8260B)	SVOCs (EPA 8270C)	CAM-17 Metals (6010B, 7471)	CrVI (7196)	TPH Diesel/Motor Oil (8015B)
Zone 5 - South Disposal Area															
DG-AX5	AX	5	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			9.5-10*	O	O	O	O	O	O	O	X	X	X	X	X
DG-AW6	AW	6	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AX6	AX	6	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AV7	AV	7	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AW7	AW	7	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			9.5-10*	O	O	O	O	O	O	O	O	O	O	O	O
DG-AX7	AX	7	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AT8	AT	8	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AU8	AU	8	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AV8	AV	8	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AW8	AW	8	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AX8	AX	8	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AY8	AY	8	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AS9	AS	9	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AT9	AT	9	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			9.5-10*	O	O	O	O	O	O	O	X	X	X	X	X
DG-AU9	AU	9	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AV9	AV	9	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			8.5-9	X	X	X	X	X	X	X	X	X	X	X	X
DG-AW9	AW	9	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AP10	AP	10	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AQ10	AQ	10	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AR10	AR	10	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AS10	AS	10	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AT10	AT	10	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AU10	AU	10	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AO11	AO	11	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			9.5-10*	O	O	O	O	O	O	O	X	X	X	X	X
DG-AP11	AP	11	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AQ11	AQ	11	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			9.5-10*	O	O	O	O	O	O	O	X	X	X	X	X
DG-AR11	AR	11	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AO12	AO	12	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
Field Sample Total				**13**	**13**	**13**	**57**	**13**	**13**	**13**	**5**	**5**	**5**	**5**	**5**
Field Duplicates/Splits (10%)				2	2	2	6	2	2	2	1	1	1	1	1
Matrix Spikes (5%)				1	1	1	3	1	1	1	1	1	1	1	1
Grand Total				**16**	**16**	**16**	**66**	**16**	**16**	**16**	**7**	**7**	**7**	**7**	**7**

Table 1a: Soil and Grab Groundwater Sampling Matrix
Brisbane OU-2
Brisbane, California

Boring ID	Grid Node (Figure 3)		Soil Sample Depth (feet bgs)	Soil Analyses							Grab Groundwater Analyses				
	Ordinate	Abscissa		VOCs & GRO (8260B)	SVOCs - PAHs (8270-SIM)	TPH - Diesel/Motor Oil (8015B)	CAM-17 Metals (6010 B, 7471)	OCPs (8081A)	PCBs (8082)	Asbestos (CARB 435)	VOCs + GRO (8260B)	SVOCs (EPA 8270C)	CAM-17 Metals (6010B, 7471)	CrVI (7196)	TPH Diesel/Motor Oil (8015B)
Zone 6 - Industrial Way Area															
DG-AX9	AX	9	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 4	X	X	X	X	X	X	X	--	--	--	--	--
			9.5-10	X	X	X	X	X	X	X	O	O	O	O	O
DG-AY9	AY	9	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AV10	AV	10	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
			14.5-15	--	--	--	X	--	--	--	--	--	--	--	--
DG-AW10	AW	10	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AX10	AX	10	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AY10	AY	10	0.5 - 1	--	--	--	O	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	O	--	--	--	--	--	--	--	--
DG-AZ10	AZ	10	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AS11	AS	11	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 4	X	X	X	X	X	X	X	--	--	--	--	--
			7.5-8	X	X	X	X	X	X	X	X	X	X	X	X
DG-AT11	AT	11	0.5 - 1	--	--	--	O	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AU11	AU	11	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 4	X	X	X	X	X	X	X	--	--	--	--	--
			9.5-10	X	X	X	X	X	X	X	O	O	O	O	O
DG-AW11	AW	11	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 5	X	X	X	X	X	X	X	--	--	--	--	--
			7.5-8	X	X	X	X	X	X	X	X	X	X	X	X
DG-AX11	AX	11	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AY11	AY	11	0.5 - 1	O	O	O	O	O	O	O	--	--	--	--	--
			3.5 - 4	O	O	O	O	O	O	O	--	--	--	--	--
			9.5-10*	O	O	O	O	O	O	O	O	O	O	O	O
DG-AZ11	AZ	11	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AP12	AP	12	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AQ12	AQ	12	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AR12	AR	12	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AS12	AS	12	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AT12	AT	12	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 4	X	X	X	X	X	X	X	--	--	--	--	--
			9.5-10	X	X	X	X	X	X	X	O	O	O	O	O
DG-AU12	AU	12	0.5 - 1	--	--	--	O	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	O	--	--	--	--	--	--	--	--
DG-AV12	AV	12	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 3	--	--	--	X	--	--	--	--	--	--	--	--
			19.5-20	--	--	--	X	--	--	--	--	--	--	--	--
DG-AW12	AW	12	0.5 - 1	--	--	--	O	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	O	--	--	--	--	--	--	--	--
DG-AN13	AN	13	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 4	X	X	X	X	X	X	X	--	--	--	--	--
			9.5-10	X	X	X	X	X	X	X	X	X	X	X	X
DG-AO13	AO	13	0.5 - 1	--	--	--	O	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	O	--	--	--	--	--	--	--	--
DG-AP13	AP	13	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 4	X	X	X	X	X	X	X	--	--	--	--	--
			9.5-10	X	X	X	X	X	X	X	O	O	O	O	O

Table 1a: Soil and Grab Groundwater Sampling Matrix
Brisbane OU-2
Brisbane, California

Boring ID	Grid Node (Figure 3)		Soil Sample Depth (feet bgs)	Soil Analyses							Grab Groundwater Analyses				
	Ordinate	Abscissa		VOCs & GRO (8260B)	SVOCs - PAHs (8270-SIM)	TPH - Diesel/Motor Oil (8015B)	CAM-17 Metals (6010 B, 7471)	OCPs (8081A)	PCBs (8082)	Asbestos (CARB 435)	VOCs + GRO (8260B)	SVOCs (EPA 8270C)	CAM-17 Metals (6010B, 7471)	CrVI (7196)	TPH Diesel/Motor Oil (8015B)
Zone 6 - Industrial Way Area															
DG-AQ13	AQ	13	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 3	--	--	--	X	--	--	--	--	--	--	--	--
			11.5-12	--	--	--	X	--	--	--	--	--	--	--	--
DG-AR13	AR	13	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 4	X	X	X	X	X	X	X	--	--	--	--	--
			9.5-10	X	X	X	X	X	X	X	O	O	O	O	O
DG-AS13	AS	13	0.5 - 1	--	--	--	O	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	O	--	--	--	--	--	--	--	--
DG-AT13	AT	13	0.5 - 1	O	O	O	X	O	O	O	--	--	--	--	--
			3.5 - 4	O	O	O	X	O	O	O	--	--	--	--	--
			9.5-10*	O	O	O	X	O	O	O	O	O	O	O	O
DG-AL14	AL	14	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AM14	AM	14	1-1.5	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	O	--	--	--	--	--	--	--	--
DG-AN14	AN	14	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	O	--	--	--	--	--	--	--	--
DG-AO14	AO	14	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	O	--	--	--	--	--	--	--	--
DG-AP14	AP	14	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AQ14	AQ	14	0.5 - 1	--	--	--	O	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	O	--	--	--	--	--	--	--	--
DG-AR14	AR	14	0.5 - 1	--	--	--	O	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	O	--	--	--	--	--	--	--	--
DG-AI15	AI	15	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 4	X	X	X	X	X	X	X	--	--	--	--	--
			9.5-10*	O	O	O	O	O	O	O	X	X	X	X	X
DG-AJ15	AJ	15	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AK15	AK	15	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 4	X	X	X	X	X	X	X	--	--	--	--	--
			9.5-10*	O	O	O	O	O	O	O	X	X	X	X	X
DG-AL15	AL	15	1-1.5	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AM15	AM	15	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 4	X	X	X	X	X	X	X	--	--	--	--	--
			9.5-10	X	X	X	X	X	X	X	X	X	X	X	X
DG-AN15	AN	15	0.5 - 1	--	--	--	O	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	O	--	--	--	--	--	--	--	--
DG-AO15	AO	15	0.5 - 1	O	O	O	O	O	O	O	--	--	--	--	--
			3.5 - 4	O	O	O	O	O	O	O	--	--	--	--	--
			9.5-10*	O	O	O	O	O	O	O	O	O	O	O	O
DG-AF16	AF	16	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AG16	AG	16	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AH16	AH	16	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AI16	AI	16	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AK16	AK	16	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AL16	AL	16	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	O	--	--	--	--	--	--	--	--
DG-AC17	AC	17	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AD17	AD	17	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 4	X	X	X	X	X	X	X	--	--	--	--	--
			7-7.5	X	X	X	X	X	X	X	X	X	X	X	X
DG-AE17	AE	17	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--

Table 1a: Soil and Grab Groundwater Sampling Matrix
Brisbane OU-2
Brisbane, California

Boring ID	Grid Node (Figure 3)		Soil Sample Depth (feet bgs)	Soil Analyses							Grab Groundwater Analyses				
	Ordinate	Abscissa		VOCs & GRO (8260B)	SVOCs - PAHs (8270-SIM)	TPH - Diesel/Motor Oil (8015B)	CAM-17 Metals (6010 B, 7471)	OCPs (8081A)	PCBs (8082)	Asbestos (CARB 435)	VOCs + GRO (8260B)	SVOCs (EPA 8270C)	CAM-17 Metals (6010B, 7471)	CrVI (7196)	TPH Diesel/Motor Oil (8015B)
Zone 6 - Industrial Way Area															
DG-AH17	AH	17	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 4	O	O	O	O	O	O	O	--	--	--	--	--
			9.5-10*	O	O	O	O	O	O	O	O	O	O	O	O
DG-AI17	AI	17	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AJ17	AJ	17	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 4	X	X	X	X	X	X	X	--	--	--	--	--
			9.5-10	X	X	X	X	X	X	X	O	O	O	O	O
DG-AA18	AA	18	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AB18	AB	18	0.5 - 1	--	--	--	O	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	O	--	--	--	--	--	--	--	--
DG-AC18	AC	18	0.5 - 1	--	--	--	O	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	O	--	--	--	--	--	--	--	--
DG-AD18	AD	18	0.5 - 1	--	--	--	O	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	O	--	--	--	--	--	--	--	--
DG-AE18	AE	18	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AF18	AF	18	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AG18	AG	18	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	X	--	--	--	--	--	--	--	--
DG-AA19	AA	19	0.5 - 1	X	X	X	X	X	X	X	--	--	--	--	--
			3.5 - 4	X	X	X	X	X	X	X	--	--	--	--	--
			8.5-9	X	X	X	X	X	X	X	X	X	X	X	X
DG-AB19	AB	19	0.5 - 1	--	--	--	O	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	O	--	--	--	--	--	--	--	--
DG-AC19	AC	19	0.5 - 1	O	O	O	O	O	O	O	--	--	--	--	--
			3.5 - 4	O	O	O	O	O	O	O	--	--	--	--	--
			9.5-10*	O	O	O	O	O	O	O	O	O	O	O	O
DG-AD19	AD	19	0.5 - 1	--	--	--	X	--	--	--	--	--	--	--	--
			3.5 - 4	--	--	--	O	--	--	--	--	--	--	--	--
Field Sample Total				**41**	**41**	**41**	**111**	**41**	**41**	**41**	**8**	**8**	**8**	**8**	**8**
Field Duplicates/Splits (10%)				5	5	5	12	5	5	5	1	1	1	1	1
Matrix Spikes (5%)				3	3	3	6	3	3	3	1	1	1	1	1
Equipment Blanks (5%)															
Grand Total				**49**	**49**	**49**	**129**	**49**	**49**	**49**	**10**	**10**	**10**	**10**	**10**

Table 1a: Soil and Grab Groundwater Sampling Matrix
Brisbane OU-2
Brisbane, California

Notes
X = Sampled as planned.
O = Planned but sample not collected due to field conditions
-- = no analysis
* = Approximate depth of saturated sample. Groundwater and/or native soil was encountered shallower than 7 feet bgs, therefore the 3.5-4' sample was considered the saturated sample and a third depth was not collected.
A field blank was planned to be collected each day of groundwater sampling.
An equipment blank was planned to be collected each day of soil or groundwater sampling and a trip blank will accompany all VOC samples.
bgs = below ground surface
CAM = California Assessment Manual
CARB = California Air Resources Board
CrVI = hexavalent chromium
GRO = gasoline range organics
OCP = organochlorine pesticide
PAHs = polycyclic aromatic hydrocarbons
PCB = polychlorinated biphenyl
SVOC = semi-volatile organic compound
TPH = total petroleum hydrocarbons
VOC = volatile organic compound

Table 1b: Groundwater Well Sampling Matrix

Brisbane OU-2

Brisbane, California

Well ID	Well Groundwater Analyses					Well Constuction Details			
	CAM-17 Metals (EPA 6010B, 7471)	Chromium VI (EPA 7196)	TPH Diesel / Motor Oil (EPA 8015B)	VOCs + GRO (EPA 8260B)	SVOCs (EPA 8270C)	Top of Casing Elevation (ft MSL) [1,2]	Casing Diameter (inches)	Total Well Depth (ft bgs)	Screened Interval (ft bgs)
KMW-4A	X	X	X	X	X	10.46	4	12	2-11
KMW-7A	X	X	X	X	X	13.66	4	12	2-11
LF-3A	X	X	X	X	X	10.95	2	15	4-10
LF-4A	X	X	X	X	X	8.32	2	15	4-14
LF-5A	X	X	X	X	X	8.49	2	8	2.5-8
LF-7A	X	X	X	X	X	10.65	2	10	4-8
LF-8A	X	X	X	X	X	9.36	2	10	5-10
MK-1A	O	O	O	O	O	10.47	2	15	3-13
MK-2A	X	X	X	X	X	12.81	2	13	3-13
MK-7A	X	X	X	X	X	10.50	2	10	3-10
MK-8A	X	X	X	X	X	16.58	2	10	5-10
MW-9A	X	X	X	X	X	11.26	2	13	3-13
MW-10A	X	X	X	X	X	9.59	2	13	3-13
MW-11AR	X	X	X	X	X	14.19	2	13	3-13
MW-13A	X	X	X	X	X	7.81	2	13	3-13
MW-15A	X	X	X	X	X	8.67	2	13	3-13
MW-17A	X	X	X	X	X	8.45	2	13	3-13

Notes:

1. Source: Levine-Fricke, 1990. *Supplemental Remedial Investigation Data Study Report* , The Bayshore Railyard, Brisbane, California. 18 July.

2. Elevations were measured during well installation and may have changed since the time of measurement.

X = Sampled as planned.

O = Planned but sample not collected due to field conditions; MK-1A behind clocked and lock gate, unable to access.

CAM = California Assessment Manual

EPA = United States Environmental Protection Agency

GRO = gasoline range organics

SVOCs = semi-volatile organic compounds

TPH = total petroleum hydrocarbons

VOCs = volatile organic compounds

Table 2: Metals Concentrations in Soil

UPC OU-2

Brisbane, California

Sample Location	Depth Range (ft bgs)	Sample Name	Collection Date	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
Direct Exposure Human Health Risk Level Residential Soil Exposure ESL [1]				1.1E+01	6.7E-02	1.5E+04	1.6E+01	7.8E+01	1.2E+05	2.3E+01	3.1E+03	8.0E+01	1.3E+01	3.9E+02	8.2E+02	3.9E+02	3.9E+02	7.8E-01	3.9E+02	2.3E+04
Regional Background [2]				5.5E+00	1.9E+01	3.2E+02	1.0E+00	2.7E+00	1.0E+02	2.5E+01	6.9E+01	1.6E+01	4.0E-01	7.4E+00	1.2E+02	5.6E+00	1.8E+00	7.6E+00	7.4E+01	1.1E+02
Units				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
DG-AA10	0.5-1	DG-AA10S-0.5-1	1/29/2019	**2.2**	**2.9**	**47**	<0.080	**0.47**	**9.3**	**8.1**	**120**	**150**	**0.069**	**0.24**	**7.7**	<0.37	<0.12	**0.8**	**71**	**84**
DG-AA10	3.5-4	DG-AA10S-3.5-4	1/29/2019	**45**	**20**	**1400**	**0.35**	**4.2**	**51**	**5.8**	**880**	**11000**	**0.61**	<0.50	**41**	**3.4**	**11**	<1.1	**29**	**3400**
DG-AA11	0.5-1	DG-AA11S-0.5-1	1/29/2019	**0.38**	**0.35**	**7.8**	<0.079	**0.077**	**18**	**10**	**51**	**3.7**	**0.076**	<0.16	**7.5**	<0.37	<0.12	<0.35	**67**	**36**
DG-AA11	3.5-4	DG-AA11S-3.5-4	1/29/2019	<0.21	**0.48**	**19**	<0.084	**0.052**	**9**	**11**	**88**	**22**	**0.066**	**0.35**	**4.1**	<0.39	<0.13	<0.37	**93**	**55**
DG-AA12	0.5-1	DG-AA12S-0.5-1	1/25/2019	**9.8**	**4.9**	**48**	<0.077	**0.62**	**21**	**12**	**390**	**710**	**1.3**	**0.26**	**21**	**0.52**	<0.12	<0.34	**91**	**120**
DG-AA12	3.5-4	DG-AA12S-3.5-4	1/25/2019	**2.4**	**5.2**	**61**	<0.11	**0.68**	**35**	**12**	**170**	**620**	**1.8**	<0.22	**48**	**0.57**	<0.17	<0.50	**70**	**160**
DG-AA13	0.5-1	DG-AA13S-0.5-1	1/24/2019	**2.9**	**1.6**	**27**	<0.083	**0.34**	**11**	**7.7**	**200**	**150**	**0.11**	<0.16	**11**	**0.39**	<0.13	**1**	**75**	**49**
DG-AA13	3.5-4	DG-AA13S-3.5-4	1/24/2019	**1.5**	**1.8**	**14**	<0.11	**0.21**	**9.6**	**17**	**89**	**31**	**0.049**	<0.21	**8.2**	<0.50	<0.17	<0.48	**100**	**57**
DG-AA14	0.5-1	DG-AA14S-0.5-1	1/24/2019	**1.6**	**3.1**	**54**	<0.12	**0.93**	**17**	**3.7**	**83**	**190**	**0.095**	**1.1**	**10**	<0.54	**0.28**	<0.52	**36**	**110**
DG-AA14	3.5-4	DG-AA14S-3.5-4	1/24/2019	**1.3**	**4**	**57**	<0.11	**0.63**	**21**	**5.4**	**130**	**220**	**0.32**	**0.89**	**15**	**0.5**	**0.25**	<0.49	**49**	**150**
DG-AA15	0.5-1	DG-AA15S-0.5-1	1/22/2019	**1.7**	**3.6**	**38**	**0.13**	**0.26**	**27**	**5.5**	**74**	**120**	**0.19**	**0.2**	**26**	<0.43	<0.15	<0.42	**36**	**53**
DG-AA16	0.5-1	DG-AA16S-0.5-1	1/24/2019	**3.5**	**3.4**	**59**	<0.12	**0.67**	**19**	**5.7**	**160**	**180**	**0.058**	**0.5**	**69**	<0.57	<0.19	**0.96**	**93**	**94**
DG-AA16	3.5-4	DG-AA16S-3.5-4	1/24/2019	**92**	**23**	**48**	<0.078	**0.6**	**20**	**3.5**	**490**	**2500**	**0.065**	**0.43**	**42**	<0.36	**0.13**	**0.64**	**48**	**73**
DG-AA17	0.5-1	DG-AA17S-0.5-1	2/5/2019	**0.59**	**2.6**	**63**	**0.19**	<0.030	**23**	**9.7**	**40**	**28**	**0.059**	**0.63**	**30**	**1.1**	<0.12	**0.46**	**44**	**42**
DG-AA17	3.5-4	DG-AA17S-3.5-4	2/5/2019	**2.9**	**7.4**	**88**	<0.12	**2.8**	**37**	**16**	**250**	**300**	**0.35**	**3.3**	**30**	**2.7**	**0.44**	**2.1**	**91**	**830**
DG-AA18	0.5-1	DG-AA18S-0.5-1	1/23/2019	<5.0	**6.9**	**94**	**0.32**	**0.31**	**32**	**7.7**	**47**	**100**	**0.08**	<1.0	**31**	<1.7	<0.89	<5.0	**37**	**89**
DG-AA18	3.5-4	DG-AA18S-3.5-4	1/23/2019	**5.5**	**6.2**	**100**	<0.25	**0.59**	**210**	**5.2**	**180**	**330**	**0.18**	<1.0	**55**	<1.7	<0.89	<5.0	**48**	**170**
DG-AA18 (D)	3.5-4	DG-AA18 (D)S-3.5-4	1/23/2019	**5.3**	**8.1**	**110**	**0.29**	**0.76**	**160**	**6.8**	**170**	**390**	**0.21**	<1.0	**53**	<1.7	<0.89	<5.0	**49**	**190**
DG-AA19	0.5-1	DG-AA19S-0.5-1	1/24/2019	**0.76**	**2.2**	**23**	<0.10	**0.15**	**33**	**6.9**	**9.4**	**5.2**	**0.026**	**0.21**	**30**	**0.94**	<0.16	<0.46	**34**	**30**
DG-AA19	3.5-4	DG-AA19S-3.5-4	1/24/2019	**0.6**	**3.9**	**92**	<0.12	**0.11**	**140**	**17**	**31**	**27**	**0.83**	<0.23	**120**	<0.54	<0.18	<0.52	**58**	**70**
DG-AA19	8.5-9	DG-AA19S-8.5-9	1/24/2019	**1.6**	**9.2**	**71**	**0.62**	**0.089**	**64**	**11**	**28**	**10**	**0.029**	<0.25	**25**	<0.58	<0.19	<0.56	**61**	**37**
DG-AA2	0.5-1	DG-AA2S-0.5-1	12/14/2018	**2.9**	**130**	**70**	<0.11	**0.36**	**16**	**11**	**220**	**230**	**0.13**	<0.21	**14**	<0.50	**0.66**	<0.48	**96**	**150**
DG-AA2	3.5-4	DG-AA2S-3.5-4	12/14/2018	**2.1**	**37**	**81**	**0.19**	<0.034	**81**	**13**	**30**	**4.3**	**0.46**	<0.18	**120**	<0.41	**0.3**	<0.40	**63**	**46**
DG-AA3	0.5-1	DG-AA3S-0.5-1	12/18/2018	**3.9**	**87**	**150**	<0.11	**1.9**	**27**	**11**	**210**	**310**	**0.34**	**1.8**	**30**	**1.1**	**0.39**	<0.49	**66**	**360**
DG-AA3 (D)	0.5-1	DG-AA3 (D)S-0.5-1	12/18/2018	**4.7**	**93**	**120**	<0.11	**4.2**	**59**	**10**	**240**	**520**	**0.95**	**2.2**	**52**	**1.3**	**0.4**	<0.51	**47**	**510**
DG-AA3	3.5-4	DG-AA3S-3.5-4	12/18/2018	<0.32	**4.8**	**110**	<0.13	**0.21**	**140**	**20**	**36**	**11**	**0.85**	**0.63**	**190**	<0.58	<0.20	<0.56	**83**	**56**
DG-AA3	7-7.5	DG-AA3S-7-7.5	12/18/2018	**1.1**	**40**	**36**	**0.49**	**0.1**	**33**	**13**	**19**	**10**	**0.075**	**0.67**	**28**	<0.52	<0.17	<0.50	**43**	**53**
DG-AA4	0.5-1	DG-AA4S-0.5-1	12/18/2018	**0.97**	**77**	**83**	**0.13**	**0.54**	**17**	**11**	**160**	**100**	**0.062**	**0.64**	**8.3**	**1.1**	<0.14	<0.39	**110**	**160**
DG-AA4	3.5-4	DG-AA4S-3.5-4	12/18/2018	**0.79**	**65**	**31**	**0.22**	**0.04**	**54**	**5.5**	**11**	**5.2**	**0.041**	<0.21	**44**	<0.48	<0.16	<0.47	**29**	**22**
DG-AA5	0.5-1	DG-AA5S-0.5-1	12/18/2018	**2.5**	**51**	**95**	<0.11	**1.3**	**23**	**9.3**	**190**	**280**	**0.49**	**2.5**	**29**	**1.3**	**0.35**	<0.50	**60**	**520**
DG-AA5	3.5-4	DG-AA5S-3.5-4	12/18/2018	**2**	**170**	**72**	<0.12	**0.11**	**12**	**11**	**130**	**87**	**0.1**	<0.24	**14**	**1.3**	<0.19	<0.54	**78**	**100**
DG-AA6	0.5-1	DG-AA6S-0.5-1	12/20/2018	**1.4**	**2.2**	**53**	<0.092	**0.19**	**10**	**16**	**110**	**31**	**0.061**	**0.29**	**7.2**	<0.42	<0.14	**1.6**	**120**	**78**
DG-AA6	3.5-4	DG-AA6S-3.5-4	12/20/2018	**5.5**	**4.8**	**410**	**0.14**	**2.4**	**17**	**1.5**	**310**	**1100**	**0.25**	<0.17	**8.2**	<0.41	**3.2**	<0.39	**6.6**	**1800**
DG-AA7	0.5-1	DG-AA7S-0.5-1	1/9/2019	**2.6**	**6**	**100**	**0.16**	**1**	**38**	**14**	**220**	**150**	**0.25**	**3.3**	**32**	**2.4**	<0.14	<0.39	**84**	**270**
DG-AA7	3.5-4	DG-AA7S-3.5-4	1/9/2019	**2.9**	**4.6**	**140**	**0.19**	**0.43**	**19**	**6.5**	**50**	**180**	**0.079**	**0.51**	**28**	<0.58	**0.27**	<0.56	**32**	**170**
DG-AA8	0.5-1	DG-AA8S-0.5-1	1/29/2019	**13**	**26**	**740**	**0.24**	**2.8**	**43**	**11**	**860**	**2000**	**0.6**	**1**	**38**	**2**	**4.7**	<0.40	**32**	**1400**
DG-AA8 (D)	0.5-1	DG-AA8 (D)S-0.5-1	1/29/2019	**20**	**17**	**1000**	**0.3**	**3.5**	**28**	**7.2**	**560**	**2600**	**1.1**	**1**	**29**	<1.3	**2.5**	<1.2	**24**	**1500**
DG-AA8	3.5-4	DG-AA8S-3.5-4	1/29/2019	**37**	**33**	**2600**	<0.59	**28**	**310**	**14**	**1500**	**12000**	**0.022**	<1.2	**57**	**3.6**	**16**	<2.6	**31**	**10000**
DG-AA9	0.5-1	DG-AA9S-0.5-1	12/20/2018	**29**	**41**	**1200**	**0.56**	**2.4**	**49**	**10**	**840**	**3900**	**0.79**	**0.95**	**53**	<1.7	**5.4**	<1.6	**35**	**2400**
DG-AB10	0.5-1	DG-AB10S-0.5-1	1/29/2019	**210**	**25**	**130**	<0.25	**2.4**	**34**	**11**	**670**	**5200**	**6.9**	**1.5**	**34**	**3.3**	**0.83**	<1.1	**52**	**840**
DG-AB10 (D)	0.5-1	DG-AB10 (D)S-0.5-1	1/29/2019	**1.2**	**0.52**	**33**	<0.075	**0.3**	**14**	**7.9**	**110**	**67**	**0.031**	**0.18**	**3.7**	**0.59**	<0.12	<0.33	**62**	**47**
DG-AB10	3.5-4	DG-AB10S-3.5-4	1/29/2019	**9.1**	**12**	**500**	**0.43**	**1.8**	**41**	**8.7**	**3500**	**1100**	**0.41**	**0.56**	**34**	**2.8**	**4.3**	<0.43	**39**	**940**
DG-AB11	0.5-1	DG-AB11S-0.5-1	1/28/2019	**0.92**	**2.8**	**24**	<0.096	**0.37**	**16**	**13**	**89**	**65**	**0.097**	**2**	**11**	<0.44	<0.15	<0.43	**87**	**73**
DG-AB11	3.5-4	DG-AB11S-3.5-4	1/28/2019	**4.1**	**9.1**	**74**	<0.11	**0.83**	**21**	**11**	**160**	**590**	**0.53**	**0.47**	**18**	<0.49	<0.16	<0.47	**84**	**200**
DG-AB12	0.5-1	DG-AB12S-0.5-1	1/25/2019	**6.4**	**11**	**150**	<0.091	**2.5**	**71**	**13**	**570**	**830**	**0.61**	**5.3**	**72**	<0.42	<0.14	<0.41	**70**	**260**
DG-AB12	3.5-4	DG-AB12S-3.5-4	1/25/2019	**250**	**38**	**170**	<0.20	**2.2**	**55**	**16**	**4400**	**4200**	**0.36**	**1.6**	**81**	**1.2**	**1.6**	<0.88	**67**	**930**
DG-AB13	0.5-1	DG-AB13S-0.5-1	1/22/2019	**540**	**22**	**180**	<0.23	**1.8**	**76**	**19**	**3000**	**7400**	**0.35**	**6.2**	**170**	**3.2**	<0.36	<1.0	**74**	**1300**
DG-AB13	3.5-4	DG-AB13S-3.5-4	1/22/2019	**37**	**12**	**30**	<0.10	**0.25**	**19**	**3**	**120**	**480**	**0.028**	<0.20	**23**	<0.47	<0.16	<0.45	**10**	**100**
DG-AB13 (D)	3.5-4	DG-AB13 (D)S-3.5-4	1/22/2019	**15**	**3.4**	**22**	<0.10	**0.12**	**14**	**1.9**	**43**	**160**	**0.02**	<0.20	**13**	<0.47	<0.16	<0.45	**8.2**	**35**
DG-AB13	13.5-14	DG-AB13S-13.5-14	1/22/2019	**2.3**	**8.9**	**35**	**0.42**	**0.2**	**25**	**10**	**44**	**62**	**0.007**	**1.1**	**40**	<0.52	<0.18	**0.79**	**41**	**84**
DG-AB14	0.5-1	DG-AB14S-0.5-1	1/31/2019	**4.4**	**3**	**64**	**0.43**	**0.23**	**13**	**6.8**	**130**	**270**	**0.031**	**0.73**	**99**	**0.68**	<0.20	<0.56	**130**	**76**
DG-AB14	3.5-4	DG-AB14S-3.5-4	1/31/2019	**8.4**	**6.3**	**35**	**0.26**	**1.7**	**15**	**5.8**	**220**	**950**	**0.034**	**0.29**	**77**	**2.6**	<0.19	<0.55	**67**	**72**

Table 2: Metals Concentrations in Soil
UPC OU-2
Brisbane, California

Sample Location	Depth Range (ft bgs)	Sample Name	Collection Date	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
Direct Exposure Human Health Risk Level Residential Soil Exposure ESL [1]				1.1E+01	6.7E-02	1.5E+04	1.6E+01	7.8E+01	1.2E+05	2.3E+01	3.1E+03	8.0E+01	1.3E+01	3.9E+02	8.2E+02	3.9E+02	3.9E+02	7.8E-01	3.9E+02	2.3E+04
Regional Background [2]				5.5E+00	1.9E+01	3.2E+02	1.0E+00	2.7E+00	1.0E+02	2.5E+01	6.9E+01	1.6E+01	4.0E-01	7.4E+00	1.2E+02	5.6E+00	1.8E+00	7.6E+00	7.4E+01	1.1E+02
Units				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
DG-AB14 (D)	3.5-4	DG-AB14 (D)S-3.5-4	1/31/2019	**8.6**	**5**	**120**	**0.26**	**0.55**	**14**	**5.2**	**170**	**640**	**0.015**	**0.26**	**73**	**0.54**	<0.17	<0.49	**70**	**68**
DG-AB15	0.5-1	DG-AB15S-0.5-1	2/1/2019	**3.5**	**4.7**	**90**	**0.32**	**1.1**	**14**	**5.3**	**110**	**280**	**0.51**	**0.93**	**46**	<1.0	<0.34	<0.97	**56**	**130**
DG-AB15	3.5-4	DG-AB15S-3.5-4	2/1/2019	**0.78**	**1.5**	**100**	**0.37**	**0.067**	**61**	**8.4**	**13**	**5**	**0.0088**	<0.16	**21**	<0.38	<0.13	<0.36	**70**	**28**
DG-AB16	0.5-1	DG-AB16S-0.5-1	2/1/2019	**3.2**	**3.5**	**63**	**0.28**	**0.41**	**13**	**4.7**	**100**	**260**	**0.11**	<0.49	**67**	<1.2	<0.39	<1.1	**69**	**85**
DG-AB16	3.5-4	DG-AB16S-3.5-4	2/1/2019	**9.6**	**11**	**54**	<0.22	**0.27**	**14**	**4.2**	**210**	**570**	**0.013**	<0.43	**57**	**1**	<0.34	<0.97	**63**	**110**
DG-AB17	0.5-1	DG-AB17S-0.5-1	1/24/2019	**5.5**	**4**	**150**	<0.11	**1.5**	**220**	**18**	**69**	**620**	**0.23**	**5.2**	**51**	**2.4**	**0.29**	<0.48	**81**	**780**
DG-AB17	3.5-4	DG-AB17S-3.5-4	1/24/2019	**2.4**	**6.9**	**180**	**0.22**	**0.79**	**21**	**7.7**	**150**	**330**	**0.38**	<0.20	**41**	**1.4**	**0.19**	<0.46	**40**	**370**
DG-AB2	0.5-1	DG-AB2S-0.5-1	12/14/2018	**0.5**	**2.1**	**58**	<0.084	**0.082**	**10**	**9.8**	**140**	**49**	**0.094**	<0.17	**9.3**	<0.39	**0.37**	<0.37	**91**	**80**
DG-AB2	3.5-4	DG-AB2S-3.5-4	12/14/2018	**2.7**	**95**	**98**	**0.15**	<0.027	**120**	**17**	**32**	**5.8**	**1.5**	<0.14	**150**	<0.32	**0.26**	<0.31	**64**	**52**
DG-AB2	7-7.5	DG-AB2S-7-7.5	12/14/2018	**1.8**	**48**	**57**	**0.6**	**0.18**	**49**	**16**	**46**	**15**	**0.24**	**0.7**	**62**	<0.32	<0.11	<0.31	**39**	**110**
DG-AB3	0.5-1	DG-AB3S-0.5-1	12/14/2018	**5.9**	**36**	**71**	<0.10	**3.5**	**15**	**10**	**200**	**200**	**0.49**	**1.1**	**37**	**1.1**	<0.16	<0.45	**66**	**180**
DG-AB3	3.5-4	DG-AB3S-3.5-4	12/14/2018	**5.5**	**20**	**180**	<0.13	**0.36**	**140**	**23**	**200**	**250**	**2.6**	**1.3**	**200**	**0.78**	<0.20	<0.56	**85**	**180**
DG-AB3	6.5-7	DG-AB3S-6.5-7	12/14/2018	**1.7**	**29**	**50**	**0.66**	<0.035	**34**	**10**	**41**	**8.8**	**0.041**	**0.95**	**32**	**1.6**	<0.14	<0.41	**41**	**67**
DG-AB4	0.5-1	DG-AB4S-0.5-1	12/18/2018	**2.4**	**110**	**51**	<0.11	**1.7**	**11**	**12**	**130**	**140**	**0.11**	**0.71**	**10**	<0.49	<0.17	<0.48	**81**	**300**
DG-AB4	3.5-4	DG-AB4S-3.5-4	12/18/2018	**0.64**	**31**	**58**	**0.15**	**0.066**	**55**	**6.6**	**8.8**	**5.5**	**0.021**	**0.76**	**44**	**0.64**	<0.10	<0.30	**36**	**25**
DG-AB4	9-9.5	DG-AB4S-9-9.5	12/18/2018	**1.1**	**13**	**47**	**0.47**	**0.076**	**37**	**12**	**37**	**13**	**0.035**	**0.98**	**30**	**0.44**	**0.37**	<0.33	**51**	**69**
DG-AB5	0.5-1	DG-AB5S-0.5-1	1/29/2019	**1.1**	**200**	**62**	**0.079**	**0.51**	**8.3**	**8.4**	**94**	**140**	**0.16**	<0.14	**9.7**	**0.68**	**0.15**	<0.32	**58**	**150**
DG-AB5 (D)	0.5-1	DG-AB5 (D)S-0.5-1	1/29/2019	**2.1**	**180**	**58**	<0.10	**0.6**	**15**	**9.8**	**100**	**93**	**0.14**	**0.32**	**14**	**1.8**	<0.16	<0.45	**68**	**100**
DG-AB5	3.5-4	DG-AB5S-3.5-4	1/29/2019	**1.1**	**54**	**31**	<0.11	**0.24**	**21**	**3.6**	**13**	**11**	**0.035**	**0.22**	**17**	**0.98**	<0.17	<0.49	**17**	**27**
DG-AB6	0.5-1	DG-AB6S-0.5-1	12/20/2018	**0.51**	**1.4**	**28**	<0.074	<0.028	**16**	**14**	**130**	**5.2**	**0.038**	<0.15	**11**	<0.34	<0.11	**0.86**	**96**	**55**
DG-AB6	3.5-4	DG-AB6S-3.5-4	12/20/2018	**6.7**	**8.2**	**360**	**0.17**	**0.8**	**14**	**2.8**	**590**	**1100**	**0.34**	**0.73**	**12**	**0.44**	**1.7**	<0.29	**8.6**	**670**
DG-AB7	0.5-1	DG-AB7S-0.5-1	12/19/2018	**2.5**	**5.7**	**110**	<0.10	**1.6**	**48**	**14**	**150**	**150**	**0.19**	**1.7**	**67**	<0.47	<0.16	<0.45	**63**	**270**
DG-AB7	3.5-4	DG-AB7S-3.5-4	12/19/2018	**2.4**	**6.9**	**180**	<0.12	**0.4**	**21**	**5.7**	**60**	**280**	**0.055**	**0.5**	**82**	<0.56	**0.2**	<0.54	**33**	**220**
DG-AB8	0.5-1	DG-AB8S-0.5-1	1/31/2019	**0.72**	**4.7**	**62**	<0.077	**0.22**	**17**	**5.2**	**28**	**47**	**0.053**	**0.18**	**16**	**0.44**	<0.12	<0.34	**31**	**110**
DG-AB8	3.5-4	DG-AB8S-3.5-4	1/31/2019	**18**	**16**	**690**	**0.28**	**0.97**	**34**	**7.7**	**510**	**3100**	**1.1**	**0.68**	**28**	**3.5**	**3.7**	<0.51	**27**	**1200**
DG-AB9	0.5-1	DG-AB9S-0.5-1	1/30/2019	<0.24	**11**	**85**	**0.29**	**0.36**	**22**	**7**	**96**	**95**	**0.13**	<0.19	**20**	<0.43	<0.15	<0.42	**50**	**140**
DG-AB9	3.5-4	DG-AB9S-3.5-4	1/30/2019	**40**	**26**	**1400**	**0.5**	**5.4**	**75**	**11**	**1000**	**5700**	**0.71**	**0.65**	**49**	<1.1	**8.7**	<1.1	**24**	**3300**
DG-AC10	0.5-1	DG-AC10S-0.5-1	1/29/2019	**2.7**	**3.8**	**150**	<0.079	**1.6**	**16**	**11**	**210**	**180**	**0.1**	**3.5**	**9.7**	**0.49**	**0.13**	**0.55**	**63**	**440**
DG-AC10	3.5-4	DG-AC10S-3.5-4	1/29/2019	**0.4**	<0.25	**31**	<0.094	**0.054**	**7.5**	**8.5**	**110**	**29**	**0.061**	<0.19	**2.8**	<0.43	<0.15	<0.42	**74**	**26**
DG-AC11	0.5-1	DG-AC11S-0.5-1	1/29/2019	<0.17	**1.2**	**17**	**0.14**	**0.088**	**15**	**11**	**62**	**16**	**0.057**	**0.45**	**9.1**	<0.31	<0.11	<0.30	**79**	**50**
DG-AC11	3.5-4	DG-AC11S-3.5-4	1/29/2019	**1.6**	**17**	**55**	**0.44**	**0.19**	**26**	**13**	**86**	**67**	**4.5**	<0.24	**37**	**1.3**	<0.19	<0.55	**54**	**80**
DG-AC11	8.5-9	DG-AC11S-8.5-9	1/29/2019	**0.26**	**6.2**	**130**	**0.22**	**0.17**	**39**	**8.1**	**15**	**24**	**0.029**	<0.15	**32**	<0.34	<0.11	<0.33	**33**	**61**
DG-AC12	0.5-1	DG-AC12S-0.5-1	1/31/2019	**3.2**	**13**	**13**	<0.090	**0.94**	**23**	**2.5**	**130**	**590**	**0.074**	**0.86**	**8.6**	**0.7**	**0.41**	<0.40	**4.4**	**440**
DG-AC12	3.5-4	DG-AC12S-3.5-4	1/31/2019	**0.71**	**3.5**	**30**	<0.11	**0.071**	**8.9**	**7.2**	**190**	**97**	**0.091**	<0.22	**20**	<0.51	<0.17	<0.50	**79**	**69**
DG-AC13	0.5-1	DG-AC13S-0.5-1	1/24/2019	**0.94**	**2.8**	**42**	<0.078	**0.31**	**20**	**5.5**	**87**	**150**	**0.094**	**4.4**	**150**	**0.64**	<0.12	<0.35	**180**	**81**
DG-AC13	3.5-4	DG-AC13S-3.5-4	1/24/2019	**0.7**	**1.4**	**44**	<0.10	**0.082**	**5.5**	**6**	**39**	**61**	**0.0089**	**0.63**	**150**	<0.46	<0.16	<0.45	**180**	**18**
DG-AC14	0.5-1	DG-AC14S-0.5-1	1/24/2019	**2.5**	**5.4**	**49**	<0.11	**1.3**	**27**	**3.9**	**130**	**310**	**0.21**	**3.7**	**21**	**1.1**	**0.62**	<0.48	**22**	**140**
DG-AC14	3.5-4	DG-AC14S-3.5-4	1/24/2019	**2.3**	**8.1**	**51**	<0.081	**0.57**	**27**	**9**	**160**	**370**	**0.19**	**1.2**	**110**	<0.38	<0.13	<0.36	**99**	**76**
DG-AC15	0.5-1	DG-AC15S-0.5-1	1/31/2019	**1.8**	**6.9**	**77**	**0.9**	**0.33**	**47**	**11**	**32**	**19**	**0.053**	**0.41**	**37**	**1.4**	<0.19	<0.53	**61**	**83**
DG-AC15 (D)	0.5-1	DG-AC15 (D)S-0.5-1	1/31/2019	**0.79**	**4.9**	**120**	**0.77**	**0.21**	**55**	**12**	**23**	**13**	**0.036**	<0.22	**41**	**0.78**	<0.17	<0.49	**58**	**55**
DG-AC15	3.5-4	DG-AC15S-3.5-4	1/31/2019	**2.5**	**85**	**59**	**0.29**	**1.2**	**57**	**8.9**	**39**	**150**	**0.13**	**0.25**	**27**	**1**	<0.12	<0.35	**43**	**260**
DG-AC15	7.5-8	DG-AC15S-7.5-8	1/31/2019	**120**	**50**	**720**	**0.44**	**17**	**65**	**8.9**	**1900**	**6400**	**2.6**	<0.17	**58**	<2.0	**17**	<1.9	**40**	**15000**
DG-AC17	0.5-1	DG-AC17S-0.5-1	1/23/2019	<5.0	**6.7**	**48**	**0.5**	<0.25	**27**	**9.2**	**18**	**6.5**	**0.041**	<1.0	**31**	<1.7	<0.89	<5.0	**41**	**39**
DG-AC17	3.5-4	DG-AC17S-3.5-4	1/23/2019	<5.0	**37**	**150**	**0.33**	<0.25	**39**	**11**	**37**	**46**	**0.079**	<1.0	**44**	<1.7	<0.89	<5.0	**36**	**78**
DG-AC2	0.5-1	DG-AC2S-0.5-1	12/14/2018	<0.32	**1.1**	**31**	<0.13	**0.27**	**8.3**	**9.1**	**120**	**20**	**0.12**	**0.3**	**3.6**	<0.58	<0.19	<0.56	**85**	**54**
DG-AC2	3.5-4	DG-AC2S-3.5-4	12/14/2018	**0.6**	**62**	**97**	**0.3**	**0.15**	**160**	**18**	**24**	**5**	**1.6**	**1.4**	**210**	<0.54	<0.18	<0.52	**57**	**49**
DG-AC3	0.5-1	DG-AC3S-0.5-1	12/19/2018	**3.3**	**20**	**61**	<0.12	**1.5**	**17**	**10**	**210**	**260**	**0.19**	**1.2**	**18**	<0.57	<0.19	<0.55	**77**	**230**
DG-AC3	3.5-4	DG-AC3S-3.5-4	12/19/2018	**1**	**11**	**150**	**0.5**	**0.092**	**160**	**25**	**47**	**26**	**7.2**	**0.9**	**210**	<0.43	<0.15	<0.42	**86**	**67**
DG-AC4	0.5-1	DG-AC4S-0.5-1	12/18/2018	**4.8**	**46**	**91**	<0.13	**0.95**	**20**	**9.9**	**210**	**270**	**0.1**	**2.1**	**16**	**1.6**	**0.43**	<0.58	**76**	**220**
DG-AC4 (D)	0.5-1	DG-AC4 (D)S-0.5-1	12/18/2018	**3.5**	**130**	**79**	<0.11	**0.69**	**19**	**9.1**	**160**	**240**	**0.066**	**1**	**18**	**0.53**	**0.32**	<0.50	**78**	**270**
DG-AC4	3.5-4	DG-AC4S-3.5-4	12/18/2018	**2.4**	**84**	**650**	**0.71**	**1.8**	**35**	**7.5**	**240**	**800**	**0.32**	**1.2**	**28**	<0.43	**1.1**	<0.41	**50**	**1200**
DG-AC5	0.5-1	DG-AC5S-0.5-1	12/18/2018	**21**	**280**	**80**	<0.081	**1.7**	**22**	**8.3**	**600**	**1300**	**0.52**	**0.39**	**32**	**0.43**	**0.63**	<0.36	**57**	**1200**

Table 2: Metals Concentrations in Soil
UPC OU-2
Brisbane, California

Sample Location	Depth Range (ft bgs)	Sample Name	Collection Date	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
Direct Exposure Human Health Risk Level Residential Soil Exposure ESL [1]				1.1E+01	6.7E-02	1.5E+04	1.6E+01	7.8E+01	1.2E+05	2.3E+01	3.1E+03	8.0E+01	1.3E+01	3.9E+02	8.2E+02	3.9E+02	3.9E+02	7.8E-01	3.9E+02	2.3E+04
Regional Background [2]				5.5E+00	1.9E+01	3.2E+02	1.0E+00	2.7E+00	1.0E+02	2.5E+01	6.9E+01	1.6E+01	4.0E-01	7.4E+00	1.2E+02	5.6E+00	1.8E+00	7.6E+00	7.4E+01	1.1E+02
Units				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
DG-AC5	3.5-4	DG-AC5S-3.5-4	12/18/2018	**4.9**	**150**	**120**	<0.10	**1.5**	**26**	**9.9**	**300**	**540**	**0.38**	**1.1**	**36**	**0.85**	**0.43**	<0.46	**56**	**460**
DG-AC6	0.5-1	DG-AC6S-0.5-1	12/20/2018	**0.97**	**7.1**	**91**	<0.076	**0.56**	**23**	**9.4**	**120**	**88**	**0.084**	**0.64**	**23**	<0.35	<0.12	**0.41**	**69**	**180**
DG-AC6	3.5-4	DG-AC6S-3.5-4	12/20/2018	**2.2**	**4.4**	**190**	**0.22**	**0.33**	**25**	**6.8**	**100**	**370**	**0.093**	<0.16	**26**	<0.38	**0.41**	<0.37	**29**	**280**
DG-AC7	0.5-1	DG-AC7S-0.5-1	1/9/2019	**2.7**	**8.3**	**160**	**0.16**	**0.96**	**28**	**12**	**160**	**120**	**0.16**	**2.7**	**30**	**1.8**	<0.14	<0.41	**77**	**200**
DG-AC7 (D)	0.5-1	DG-AC7 (D)S-0.5-1	1/9/2019	**1.8**	**7.8**	**60**	**0.091**	**0.62**	**16**	**6.4**	**77**	**79**	**0.14**	**1.1**	**22**	**1.2**	**0.13**	<0.39	**38**	**130**
DG-AC7	3.5-4	DG-AC7S-3.5-4	1/9/2019	**38**	**26**	**1300**	**0.93**	**5.1**	**55**	**9.4**	**610**	**3400**	**0.36**	**3.6**	**47**	**4.1**	**5.6**	**1.4**	**26**	**2300**
DG-AC7	7.5-8	DG-AC7S-7.5-8	1/9/2019	**4.6**	**13**	**180**	**0.91**	**0.36**	**39**	**13**	**96**	**360**	**0.13**	**1.1**	**52**	**3.5**	**0.42**	**4.3**	**49**	**390**
DG-AC8	0.5-1	DG-AC8S-0.5-1	1/31/2019	**14**	**28**	**260**	<0.096	**0.6**	**110**	**11**	**240**	**390**	**0.12**	**54**	**76**	**10**	<0.75	<0.43	**28**	**650**
DG-AC8	3.5-4	DG-AC8S-3.5-4	1/31/2019	**30**	**37**	**1300**	**0.59**	**0.97**	**37**	**12**	**2400**	**7200**	**0.7**	**2.5**	**51**	**5.2**	**10**	<1.4	**19**	**2000**
DG-AC9	0.5-1	DG-AC9S-0.5-1	12/20/2018	**2.2**	**3.8**	**75**	**0.24**	**0.87**	**22**	**10**	**120**	**190**	**0.12**	**0.94**	**18**	<0.45	<0.15	<0.44	**83**	**180**
DG-AC9	3.5-4	DG-AC9S-3.5-4	12/20/2018	**43**	**35**	**1700**	**0.95**	**3.7**	**52**	**9.9**	**1700**	**11000**	**0.62**	**4.1**	**46**	<1.3	**8.9**	**2.1**	**37**	**2800**
DG-AD10	0.5-1	DG-AD10S-0.5-1	1/15/2019	**0.82**	**0.74**	**41**	**0.16**	**0.15**	**15**	**14**	**91**	**12**	**0.058**	**0.18**	**7.9**	<0.42	<0.14	<0.41	**99**	**77**
DG-AD10	3.5-4	DG-AD10S-3.5-4	1/15/2019	**1.2**	**1.6**	**44**	<0.12	**0.2**	**17**	**13**	**130**	**28**	**0.12**	<0.24	**8.9**	<0.57	<0.19	<0.55	**85**	**130**
DG-AD11	0.5-1	DG-AD11S-0.5-1	1/31/2019	<0.33	**0.73**	**18**	<0.13	<0.050	**12**	**13**	**79**	**0.76**	**0.076**	<0.26	**8.2**	**0.85**	**0.2**	**1.1**	**100**	**46**
DG-AD11	3.5-4	DG-AD11S-3.5-4	1/31/2019	**1.5**	**3.1**	**30**	<0.096	**0.37**	**9**	**2**	**41**	**170**	**0.049**	**0.44**	**8**	**0.75**	<0.15	<0.43	**9.4**	**94**
DG-AD12	0.5-1	DG-AD12S-0.5-1	1/31/2019	**2**	**6**	**41**	<0.11	**0.14**	**42**	**8.4**	**150**	**290**	**0.13**	**1.1**	**100**	**0.91**	**0.16**	<0.47	**100**	**84**
DG-AD12 (D)	0.5-1	DG-AD12 (D)S-0.5-1	1/31/2019	**2.6**	**13**	**71**	<0.11	**0.19**	**33**	**8.9**	**240**	**290**	**0.21**	**2.3**	**150**	**2.5**	**0.34**	<0.48	**170**	**91**
DG-AD12	3.5-4	DG-AD12S-3.5-4	1/31/2019	**5.3**	**10**	**32**	**0.12**	**0.15**	**23**	**5.2**	**150**	**1000**	**0.097**	**0.27**	**12**	**0.52**	<0.15	<0.43	**28**	**120**
DG-AD13	0.5-1	DG-AD13S-0.5-1	2/1/2019	**1.2**	**2.6**	**59**	<0.092	**0.17**	**19**	**5.4**	**110**	**160**	**0.16**	**1.2**	**130**	**1.1**	**0.28**	<0.41	**120**	**74**
DG-AD13	3.5-4	DG-AD13S-3.5-4	2/1/2019	**1.5**	**9.7**	**86**	<0.091	**0.077**	**16**	**9**	**130**	**190**	**0.5**	**2.5**	**260**	**1.3**	**0.72**	<0.41	**290**	**81**
DG-AD13	7.5-8	DG-AD13S-7.5-8	2/1/2019	**14**	**13**	**190**	<0.11	**0.84**	**21**	**6.3**	**200**	**1000**	**0.084**	**1.1**	**140**	**2.1**	**0.78**	<0.47	**140**	**510**
DG-AD13 (D)	7.5-8	DG-AD13 (D)S-7.5-8	2/1/2019	**13**	**43**	**350**	**0.18**	**1.5**	**37**	**11**	**220**	**1200**	**0.21**	**0.74**	**84**	**4.1**	**1.2**	<0.46	**35**	**1000**
DG-AD14	0.5-1	DG-AD14S-0.5-1	2/1/2019	**1.3**	**5.5**	**61**	**0.4**	**0.65**	**23**	**6.7**	**320**	**360**	**0.29**	**2.2**	**160**	<0.99	**0.91**	<0.95	**220**	**130**
DG-AD14	3.5-4	DG-AD14S-3.5-4	2/1/2019	**2.8**	**8.9**	**29**	**0.45**	**0.32**	**29**	**13**	**260**	**240**	**0.22**	**5.2**	**190**	**2.4**	**0.75**	<0.41	**310**	**51**
DG-AD15	0.5-1	DG-AD15S-0.5-1	1/23/2019	<5.0	**12**	**53**	**0.5**	**0.3**	**36**	**13**	**50**	**28**	**0.022**	<1.0	**31**	<1.7	<0.89	<5.0	**45**	**93**
DG-AD15	3.5-4	DG-AD15S-3.5-4	1/23/2019	<5.0	**1.7**	**26**	<0.25	<0.25	**45**	**3.2**	**7.6**	**3**	**0.032**	<0.99	**17**	<1.7	<0.88	<5.0	**37**	**16**
DG-AD16	0.5-1	DG-AD16S-0.5-1	1/23/2019	<5.0	**210**	**130**	**0.36**	**0.44**	**25**	**8**	**150**	**39**	**0.064**	<1.0	**23**	<1.7	<0.89	<5.0	**28**	**210**
DG-AD16 (D)	0.5-1	DG-AD16 (D)S-0.5-1	1/23/2019	<5.0	**6.3**	**76**	**0.35**	**0.33**	**36**	**7.2**	**33**	**72**	**0.064**	<0.99	**30**	<1.7	<0.88	<5.0	**44**	**74**
DG-AD16	3.5-4	DG-AD16S-3.5-4	1/23/2019	<5.0	**19**	**49**	<0.25	**0.37**	**11**	**8.1**	**92**	**120**	**0.13**	<1.0	**7.6**	<1.7	<0.89	<5.0	**59**	**180**
DG-AD17	0.5-1	DG-AD17S-0.5-1	1/24/2019	**1.3**	**2.4**	**230**	**0.25**	**0.35**	**31**	**12**	**56**	**13**	**0.043**	<0.16	**27**	**1.4**	**0.33**	<0.35	**58**	**50**
DG-AD17	3.5-4	DG-AD17S-3.5-4	1/24/2019	**1.7**	**9.2**	**98**	**0.59**	**0.17**	**37**	**11**	**45**	**16**	**0.15**	<0.20	**32**	**0.62**	<0.16	<0.45	**40**	**110**
DG-AD17	7-7.5	DG-AD17S-7-7.5	1/24/2019	**1.4**	**8.6**	**57**	**0.61**	**0.25**	**57**	**8.2**	**29**	**15**	**0.035**	**0.33**	**32**	**1.7**	<0.11	<0.33	**50**	**80**
DG-AD2	0.5-1	DG-AD2S-0.5-1	12/14/2018	**0.97**	**21**	**46**	**0.22**	**0.61**	**36**	**9.2**	**240**	**110**	**0.16**	**1.1**	**9.2**	<0.57	**0.22**	<0.55	**69**	**160**
DG-AD2	3.5-4	DG-AD2S-3.5-4	12/14/2018	<0.20	**15**	**72**	<0.077	**0.11**	**100**	**14**	**22**	**3.6**	**0.45**	**0.43**	**120**	<0.36	<0.12	<0.34	**47**	**37**
DG-AD2 (D)	3.5-4	DG-AD2 (D)S-3.5-4	12/14/2018	**0.45**	**17**	**95**	**0.22**	**0.12**	**92**	**14**	**24**	**4.8**	**0.77**	**0.55**	**120**	<0.37	<0.13	<0.36	**51**	**45**
DG-AD3	0.5-1	DG-AD3S-0.5-1	12/14/2018	**33**	**470**	**200**	<0.13	**1.9**	**27**	**13**	**420**	**1400**	**0.41**	**1**	**20**	**2.1**	**1.2**	<0.56	**94**	**480**
DG-AD3	3.5-4	DG-AD3S-3.5-4	12/14/2018	**2.3**	**25**	**110**	**0.21**	**0.16**	**170**	**20**	**49**	**48**	**3.7**	**0.77**	**170**	**1.2**	<0.12	<0.33	**68**	**73**
DG-AD4	0.5-1	DG-AD4S-0.5-1	12/18/2018	**1.3**	**24**	**55**	**0.31**	**0.53**	**12**	**11**	**120**	**89**	**0.059**	**0.73**	**9.1**	<0.50	<0.17	<0.48	**120**	**89**
DG-AD4	3.5-4	DG-AD4S-3.5-4	12/18/2018	**0.63**	**34**	**45**	**0.35**	**0.15**	**26**	**3.9**	**75**	**31**	**0.043**	<0.24	**21**	<0.56	<0.19	<0.54	**18**	**99**
DG-AD5	0.5-1	DG-AD5S-0.5-1	1/8/2019	**3.2**	**88**	**85**	<0.078	**0.3**	**16**	**13**	**150**	**180**	**0.14**	**0.93**	**13**	**2.1**	**0.29**	<0.35	**98**	**140**
DG-AD5	3.5-4	DG-AD5S-3.5-4	1/8/2019	**0.49**	**12**	**47**	**0.2**	**0.063**	**35**	**5.2**	**10**	**11**	**0.02**	**0.38**	**27**	**0.65**	<0.11	<0.33	**25**	**28**
DG-AD6	0.5-1	DG-AD6S-0.5-1	12/20/2018	**1.4**	**3**	**75**	<0.11	**0.92**	**24**	**14**	**280**	**140**	**0.12**	**1.2**	**17**	<0.53	<0.18	**1.2**	**82**	**190**
DG-AD6	3.5-4	DG-AD6S-3.5-4	12/20/2018	**4.3**	**10**	**210**	**0.19**	**0.86**	**19**	**4.7**	**63**	**250**	**0.098**	**0.39**	**21**	**0.83**	**0.63**	<0.47	**26**	**240**
DG-AD7	0.5-1	DG-AD7S-0.5-1	12/19/2018	**5.7**	**10**	**120**	<0.11	**4.2**	**64**	**15**	**470**	**480**	**0.72**	**7.3**	**77**	**1.4**	**0.19**	<0.49	**64**	**970**
DG-AD7	3.5-4	DG-AD7S-3.5-4	12/19/2018	**0.76**	**5.2**	**76**	<0.085	**0.14**	**21**	**6.2**	**24**	**55**	**0.048**	**0.43**	**24**	<0.39	<0.13	<0.38	**34**	**74**
DG-AD8	0.5-1	DG-AD8S-0.5-1	1/31/2019	**30**	**14**	**1200**	**0.73**	**2.6**	**29**	**5.7**	**510**	**4500**	**0.73**	**1.1**	**26**	**1.2**	**3.8**	**11**	**28**	**2100**
DG-AD8	3.5-4	DG-AD8S-3.5-4	1/31/2019	**4**	**7.9**	**84**	<0.13	**2.1**	**79**	**11**	**200**	**270**	**0.11**	**1.9**	**55**	**2**	**0.45**	<0.57	**62**	**370**
DG-AD9	0.5-1	DG-AD9S-0.5-1	1/9/2019	**40**	**14**	**140**	**0.27**	**3.3**	**52**	**11**	**400**	**460**	**0.8**	**7.9**	**41**	**2.9**	**0.55**	<1.2	**38**	**820**
DG-AD9	3.5-4	DG-AD9S-3.5-4	1/9/2019	**59**	**16**	**910**	**0.48**	**2**	**25**	**6.7**	**950**	**3200**	**0.88**	**1.8**	**32**	**2.4**	**3.7**	<0.44	**32**	**1500**
DG-AE10	0.5-1	DG-AE10S-0.5-1	1/15/2019	<0.28	**0.65**	**11**	<0.11	**0.093**	**14**	**21**	**99**	**1.7**	**0.072**	**0.68**	**6.5**	**0.67**	<0.17	<0.49	**110**	**59**
DG-AE10	3.5-4	DG-AE10S-3.5-4	1/15/2019	<0.28	**0.89**	**19**	<0.11	<0.042	**8.3**	**6.3**	**76**	**1.4**	**0.1**	<0.22	**3.9**	<0.51	<0.17	**0.52**	**54**	**95**
DG-AE11	0.5-1	DG-AE11S-0.5-1	1/21/2019	**0.5**	**2.6**	**24**	<0.068	**0.13**	**27**	**4.2**	**10**	**17**	**0.04**	**0.16**	**20**	<0.31	<0.11	<0.30	**26**	**32**

Table 2: Metals Concentrations in Soil
UPC OU-2
Brisbane, California

Sample Location	Depth Range (ft bgs)	Sample Name	Collection Date	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
Direct Exposure Human Health Risk Level Residential Soil Exposure ESL [1]				1.1E+01	6.7E-02	1.5E+04	1.6E+01	7.8E+01	1.2E+05	2.3E+01	3.1E+03	8.0E+01	1.3E+01	3.9E+02	8.2E+02	3.9E+02	3.9E+02	7.8E-01	3.9E+02	2.3E+04
Regional Background [2]				5.5E+00	1.9E+01	3.2E+02	1.0E+00	2.7E+00	1.0E+02	2.5E+01	6.9E+01	1.6E+01	4.0E-01	7.4E+00	1.2E+02	5.6E+00	1.8E+00	7.6E+00	7.4E+01	1.1E+02
Units				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
DG-AE11	3.5-4	DG-AE11S-3.5-4	1/21/2019	**1.3**	**2.8**	**31**	<0.10	**0.16**	**10**	**9.2**	**120**	**28**	**0.12**	<0.20	**9.1**	**0.54**	<0.16	<0.45	**95**	**41**
DG-AE12	0.5-1	DG-AE12S-0.5-1	1/25/2019	**0.37**	**4.3**	**280**	**0.41**	**0.61**	**60**	**12**	**38**	**36**	**0.2**	**1.3**	**60**	<0.57	<0.19	<0.55	**70**	**66**
DG-AE12	3.5-4	DG-AE12S-3.5-4	1/25/2019	<0.31	**23**	**66**	**0.43**	**0.36**	**40**	**5**	**20**	**48**	**0.029**	<0.24	**33**	<0.56	<0.19	<0.54	**32**	**290**
DG-AE13	0.5-1	DG-AE13S-0.5-1	1/25/2019	**1.5**	**5.8**	**52**	**0.2**	**0.47**	**50**	**10**	**120**	**220**	**0.085**	**1.2**	**82**	**0.75**	<0.19	<0.55	**84**	**89**
DG-AE13	3.5-4	DG-AE13S-3.5-4	1/25/2019	**0.82**	**3.8**	**110**	**0.27**	**0.48**	**30**	**4.4**	**16**	**110**	**0.029**	<0.25	**24**	<0.58	<0.19	<0.56	**22**	**120**
DG-AE14	0.5-1	DG-AE14S-0.5-1	1/23/2019	<5.0	**4.4**	**110**	<0.25	**0.81**	**37**	**5.6**	**25**	**26**	**0.061**	<1.0	**42**	<1.7	<0.89	<5.0	**66**	**63**
DG-AE14	3.5-4	DG-AE14S-3.5-4	1/23/2019	<5.0	**35**	**130**	<0.25	**0.44**	**110**	**9.7**	**110**	**92**	**0.25**	<1.0	**31**	<1.7	<0.89	<5.0	**47**	**180**
DG-AE16	0.5-1	DG-AE16S-0.5-1	1/23/2019	<5.0	**5.3**	**100**	**0.33**	**0.44**	**29**	**5.8**	**38**	**120**	**0.28**	<1.0	**43**	<1.7	<0.89	<5.0	**23**	**170**
DG-AE16	3.5-4	DG-AE16S-3.5-4	1/23/2019	<5.0	**5.8**	**98**	**0.35**	**0.48**	**30**	**5.6**	**45**	**140**	**0.72**	<1.0	**35**	<1.7	<0.89	<5.0	**22**	**200**
DG-AE17	0.5-1	DG-AE17S-0.5-1	1/23/2019	<5.0	**7.6**	**39**	<0.25	**0.49**	**23**	**8.7**	**36**	**220**	**0.043**	<1.0	**26**	<1.7	<0.89	<5.0	**25**	**81**
DG-AE17	3.5-4	DG-AE17S-3.5-4	1/23/2019	<5.0	<1.5	**32**	<0.25	<0.25	**8.8**	**7.7**	**79**	<1.0	**0.052**	<1.0	**4**	<1.7	<0.89	<5.0	**80**	**62**
DG-AE18	0.5-1	DG-AE18S-0.5-1	1/23/2019	<5.0	**7.4**	**81**	**0.45**	<0.25	**44**	**14**	**17**	**10**	**0.051**	<1.0	**32**	<1.7	<0.89	<5.0	**45**	**59**
DG-AE18	3.5-4	DG-AE18S-3.5-4	1/23/2019	<5.0	**15**	**190**	**0.56**	<0.25	**26**	**27**	**20**	**15**	**0.048**	<0.99	**24**	<1.7	<0.88	<5.0	**39**	**140**
DG-AE2	0.5-1	DG-AE2S-0.5-1	12/14/2018	**4.7**	**18**	**130**	<0.13	**1.1**	**20**	**9.2**	**260**	**330**	**0.27**	**1.5**	**48**	<0.58	**0.2**	<0.56	**64**	**250**
DG-AE2	3.5-4	DG-AE2S-3.5-4	12/14/2018	**1.9**	**7.4**	**70**	**0.14**	<0.026	**92**	**12**	**30**	**3.2**	**2.2**	<0.13	**110**	**0.37**	<0.10	<0.30	**45**	**39**
DG-AE3	0.5-1	DG-AE3S-0.5-1	12/19/2018	<0.26	**1.2**	**31**	**0.11**	**0.053**	**9.3**	**11**	**120**	**2.3**	**0.027**	**0.46**	**4.1**	**0.61**	<0.16	<0.46	**110**	**39**
DG-AE3	3.5-4	DG-AE3S-3.5-4	12/19/2018	**1.6**	**71**	**130**	<0.12	**0.38**	**92**	**16**	**57**	**91**	**1.2**	**0.67**	**110**	<0.55	<0.19	<0.53	**62**	**120**
DG-AE4	0.5-1	DG-AE4S-0.5-1	12/18/2018	**8.4**	**190**	**190**	<0.094	**2.1**	**38**	**8.6**	**260**	**780**	**0.46**	**2.3**	**33**	**0.86**	**0.89**	<0.42	**54**	**900**
DG-AE4	3.5-4	DG-AE4S-3.5-4	12/18/2018	**1.6**	**81**	**66**	**0.26**	**0.18**	**46**	**6.6**	**8.9**	**5.7**	**0.016**	**0.53**	**36**	**0.38**	**0.12**	<0.31	**30**	**30**
DG-AE5	0.5-1	DG-AE5S-0.5-1	12/17/2018	**14**	**23**	**130**	<0.11	**3.6**	**890**	**16**	**420**	**640**	**1**	**40**	**460**	<0.50	**1.3**	<0.48	**54**	**1300**
DG-AE5	3.5-4	DG-AE5S-3.5-4	12/17/2018	**17**	**1400**	**150**	**0.11**	**0.79**	**24**	**10**	**230**	**520**	**0.21**	**0.5**	**31**	<0.35	**1**	**1.5**	**50**	**540**
DG-AE6	0.5-1	DG-AE6S-0.5-1	12/20/2018	**4.6**	**4.3**	**92**	<0.10	**1.4**	**33**	**11**	**220**	**180**	**0.24**	**3.3**	**32**	<0.47	<0.16	**0.7**	**56**	**290**
DG-AE6	3.5-4	DG-AE6S-3.5-4	12/20/2018	**2.2**	**6.2**	**170**	**0.23**	**1.1**	**20**	**6.9**	**53**	**270**	**0.84**	**0.26**	**22**	<0.47	**0.39**	<0.46	**29**	**430**
DG-AE6 (D)	3.5-4	DG-AE6 (D)S-3.5-4	12/20/2018	**4.8**	**12**	**210**	**0.24**	**0.51**	**19**	**6.5**	**80**	**6300**	**0.18**	**1**	**23**	<0.39	**0.79**	<0.38	**29**	**390**
DG-AE7	0.5-1	DG-AE7S-0.5-1	1/9/2019	**2**	**7.7**	**83**	**0.14**	**0.58**	**19**	**14**	**98**	**100**	**0.061**	**0.91**	**32**	**1.8**	<0.14	<0.40	**76**	**300**
DG-AE7	3.5-4	DG-AE7S-3.5-4	1/9/2019	**3.2**	**8.8**	**130**	**0.16**	**0.2**	**15**	**5.7**	**47**	**220**	**0.033**	**0.79**	**15**	**1.1**	<0.14	<0.40	**35**	**120**
DG-AE7	8-8.5	DG-AE7S-8-8.5	1/9/2019	**2.2**	**12**	**60**	**0.94**	**0.12**	**38**	**22**	**55**	**29**	**0.1**	**0.73**	**65**	**1.8**	<0.19	<0.54	**49**	**120**
DG-AE8	0.5-1	DG-AE8S-0.5-1	1/31/2019	**4.3**	**9.3**	**85**	<0.085	**2.6**	**53**	**11**	**230**	**320**	**0.25**	**4.1**	**64**	**1.9**	**0.42**	**0.85**	**48**	**490**
DG-AE8	3.5-4	DG-AE8S-3.5-4	1/31/2019	**0.57**	**3.6**	**57**	<0.13	**0.071**	**23**	**6.7**	**28**	**45**	**0.021**	<0.25	**22**	<0.58	<0.20	<0.56	**41**	**51**
DG-AF10	0.5-1	DG-AF10S-0.5-1	1/15/2019	**0.64**	**2.3**	**69**	<0.13	**0.46**	**13**	**9.4**	**130**	**130**	**0.1**	**0.67**	**5.9**	<0.59	<0.20	<0.57	**89**	**170**
DG-AF10	3.5-4	DG-AF10S-3.5-4	1/15/2019	**0.76**	**3.8**	**220**	**0.16**	**2.1**	**75**	**12**	**34**	**120**	**0.082**	**0.9**	**38**	<0.49	<0.17	<0.48	**62**	**940**
DG-AF11	0.5-1	DG-AF11S-0.5-1	1/28/2019	**0.66**	**5.1**	**31**	<0.11	**0.15**	**31**	**5.7**	**15**	**26**	**0.065**	<0.22	**25**	<0.52	<0.17	<0.50	**31**	**36**
DG-AF11	3.5-4	DG-AF11S-3.5-4	1/28/2019	**3.4**	**8.2**	**42**	<0.11	**0.39**	**17**	**8.7**	**130**	**190**	**0.51**	**0.62**	**23**	**1.3**	<0.17	<0.49	**57**	**77**
DG-AF12	0.5-1	DG-AF12S-0.5-1	1/25/2019	**1.2**	**25**	**100**	**0.1**	**0.27**	**33**	**7.7**	**52**	**150**	**0.11**	**0.15**	**41**	<0.36	<0.12	<0.35	**41**	**110**
DG-AF12	3.5-4	DG-AF12S-3.5-4	1/25/2019	**1.7**	**36**	**83**	**0.096**	**0.28**	**14**	**2.5**	**94**	**280**	**0.061**	<0.16	**12**	<0.38	<0.13	<0.37	**14**	**150**
DG-AF13	0.5-1	DG-AF13S-0.5-1	11/21/2018	**0.79**	**19**	**80**	**0.14**	**0.073**	**48**	**8.2**	**16**	**31**	**0.097**	**0.25**	**24**	<0.52	**0.38**	<0.50	**43**	**36**
DG-AF13	0.5-1	DG-AF13S-0.5-1	1/28/2019	**0.97**	**5.6**	**120**	**0.15**	**0.26**	**40**	**7.9**	**40**	**120**	**0.058**	**0.28**	**40**	**0.6**	<0.20	**0.86**	**39**	**110**
DG-AF13	3.5-4	DG-AF13S-3.5-4	11/21/2018	**5.9**	**11**	**440**	**0.21**	**1.1**	**30**	**7.7**	**190**	**1500**	**0.47**	**0.4**	**26**	<0.53	**1.9**	<0.51	**60**	**550**
DG-AF13	3.5-4	DG-AF13S-3.5-4	1/28/2019	**3.3**	**46**	**85**	<0.11	**0.54**	**29**	**4.8**	**110**	**360**	**0.19**	<0.22	**22**	<0.52	**0.57**	**0.53**	**21**	**370**
DG-AF13	7-7.5	DG-AF13S-7-7.5	11/21/2018	**4.5**	**10**	**400**	**0.56**	**0.69**	**28**	**9.7**	**120**	**890**	**0.15**	**0.45**	**29**	<0.56	**2.2**	<0.54	**30**	**460**
DG-AF14	0.5-1	DG-AF14S-0.5-1	2/5/2019	<0.30	**1.2**	**58**	<0.12	<0.045	**21**	**7**	**40**	**83**	**0.057**	**0.3**	**23**	**0.97**	<0.18	<0.53	**46**	**54**
DG-AF14	3.5-4	DG-AF14S-3.5-4	2/5/2019	<0.30	**0.47**	**88**	<0.12	<0.044	**13**	**7.2**	**38**	**18**	**0.042**	**0.24**	**21**	<0.54	<0.18	**0.77**	**47**	**36**
DG-AF16	0.5-1	DG-AF16S-0.5-1	1/23/2019	<5.0	**2.8**	**300**	**0.39**	**0.25**	**20**	**8.8**	**54**	**13**	**0.11**	**3.4**	**33**	<1.7	<0.89	<5.0	**36**	**58**
DG-AF16	3.5-4	DG-AF16S-3.5-4	1/23/2019	<5.0	**5.9**	**91**	**0.36**	<0.25	**52**	**12**	**17**	**7.6**	**0.025**	<1.0	**29**	<1.7	<0.89	<5.0	**44**	**42**
DG-AF16 (D)	3.5-4	DG-AF16 (D)S-3.5-4	1/23/2019	<5.0	**6.3**	**100**	**0.46**	<0.25	**46**	**14**	**20**	**9.4**	**0.02**	<1.0	**30**	<1.7	<0.89	<5.0	**46**	**48**
DG-AF18	0.5-1	DG-AF18S-0.5-1	1/23/2019	<5.0	**31**	**110**	**0.38**	**0.29**	**39**	**9.1**	**27**	**74**	**0.12**	<1.0	**28**	<1.7	<0.89	<5.0	**37**	**110**
DG-AF18 (D)	0.5-1	DG-AF18 (D)S-0.5-1	1/23/2019	<5.0	**6.8**	**79**	**0.36**	<0.25	**55**	**9.9**	**14**	**7.4**	**0.016**	<1.0	**30**	<1.7	<0.89	<5.0	**49**	**57**
DG-AF18	3.5-4	DG-AF18S-3.5-4	1/23/2019	<5.0	**18**	**520**	**0.54**	**0.33**	**38**	**14**	**160**	**12**	**0.51**	<1.0	**43**	<1.7	<0.89	<5.0	**40**	**65**
DG-AF2	0.5-1	DG-AF2S-0.5-1	12/14/2018	**3.8**	**16**	**190**	<0.087	**1**	**23**	**8.4**	**170**	**520**	**0.27**	**2.6**	**29**	**0.83**	**0.28**	<0.39	**46**	**290**
DG-AF2 (D)	0.5-1	DG-AF2 (D)S-0.5-1	12/14/2018	**1.7**	**12**	**110**	<0.098	**0.45**	**17**	**9.1**	**140**	**220**	**0.19**	**1.4**	**20**	<0.45	<0.15	<0.44	**66**	**160**
DG-AF2	3.5-4	DG-AF2S-3.5-4	12/14/2018	**1.1**	**8.3**	**79**	**0.35**	<0.039	**24**	**12**	**41**	**16**	**1.2**	<0.20	**41**	**0.57**	**0.2**	<0.46	**26**	**85**
DG-AF3	0.5-1	DG-AF3S-0.5-1	12/14/2018	**1.1**	**8.5**	**27**	<0.12	<0.044	**8.5**	**14**	**120**	**18**	**0.052**	**0.52**	**6**	<0.53	<0.18	<0.51	**120**	**60**

Table 2: Metals Concentrations in Soil
UPC OU-2
Brisbane, California

Sample Location	Depth Range (ft bgs)	Sample Name	Collection Date	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
Direct Exposure Human Health Risk Level Residential Soil Exposure ESL [1]				1.1E+01	6.7E-02	1.5E+04	1.6E+01	7.8E+01	1.2E+05	2.3E+01	3.1E+03	8.0E+01	1.3E+01	3.9E+02	8.2E+02	3.9E+02	3.9E+02	7.8E-01	3.9E+02	2.3E+04
Regional Background [2]				5.5E+00	1.9E+01	3.2E+02	1.0E+00	2.7E+00	1.0E+02	2.5E+01	6.9E+01	1.6E+01	4.0E-01	7.4E+00	1.2E+02	5.6E+00	1.8E+00	7.6E+00	7.4E+01	1.1E+02
Units				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
DG-AF3	3.5-4	DG-AF3S-3.5-4	12/14/2018	**1.1**	**13**	**140**	**0.38**	**0.15**	**34**	**16**	**60**	**32**	**0.13**	**0.91**	**51**	**0.83**	<0.11	<0.31	**37**	**120**
DG-AF4	0.5-1	DG-AF4S-0.5-1	12/18/2018	**3.5**	**25**	**73**	**0.25**	**1.4**	**22**	**6**	**170**	**260**	**0.19**	**5.8**	**17**	**0.37**	**0.6**	<0.31	**43**	**330**
DG-AF4	3.5-4	DG-AF4S-3.5-4	12/18/2018	**1.1**	**31**	**98**	<0.12	**0.27**	**35**	**5.3**	**26**	**81**	**0.033**	**0.33**	**28**	<0.55	**0.37**	<0.53	**27**	**100**
DG-AF5	0.5-1	DG-AF5S-0.5-1	1/8/2019	**13**	**20**	**160**	<0.076	**5.5**	**78**	**13**	**550**	**700**	**0.68**	**9.7**	**83**	**4.7**	**1.7**	<0.34	**47**	**1200**
DG-AF5	3.5-4	DG-AF5S-3.5-4	1/8/2019	**1.7**	**120**	**40**	**0.14**	**0.07**	**28**	**4.9**	**16**	**19**	**0.044**	<0.16	**28**	**0.56**	<0.13	<0.36	**18**	**40**
DG-AF6	0.5-1	DG-AF6S-0.5-1	12/20/2018	**1.4**	**1.7**	**17**	<0.12	**0.13**	**20**	**20**	**120**	**28**	**0.11**	**0.25**	**11**	<0.57	<0.19	**0.68**	**150**	**110**
DG-AF6	3.5-4	DG-AF6S-3.5-4	12/20/2018	**25**	**18**	**160**	<0.098	**0.83**	**22**	**5.9**	**420**	**810**	**0.19**	**0.51**	**62**	<0.45	<0.15	<0.44	**55**	**340**
DG-AF7	0.5-1	DG-AF7S-0.5-1	12/19/2018	**22**	**19**	**360**	**0.15**	**8.3**	**780**	**16**	**650**	**1800**	**0.93**	**13**	**78**	<0.94	**7.1**	<0.91	**59**	**1700**
DG-AF7	3.5-4	DG-AF7S-3.5-4	12/19/2018	**0.82**	**3.9**	**93**	**0.48**	**0.54**	**21**	**7.4**	**44**	**35**	**0.028**	**0.7**	**17**	<0.37	<0.13	<0.36	**52**	**58**
DG-AF8	0.5-1	DG-AF8S-0.5-1	1/31/2019	**4.4**	**11**	**81**	**0.22**	**1.5**	**31**	**6.2**	**140**	**290**	**0.15**	**1.5**	**41**	**2.1**	**0.25**	<0.45	**23**	**270**
DG-AF8	3.5-4	DG-AF8S-3.5-4	1/31/2019	**8.3**	**6.2**	**540**	**0.43**	**1.7**	**21**	**4.9**	**1900**	**970**	**0.12**	<0.18	**23**	**2**	**2.2**	<0.40	**28**	**1500**
DG-AG10	0.5-1	DG-AG10S-0.5-1	1/15/2019	**2.8**	**6.6**	**99**	<0.12	**1.6**	**17**	**5.8**	**160**	**470**	**0.27**	**1.1**	**14**	<0.54	<0.18	<0.52	**52**	**1200**
DG-AG10	3.5-4	DG-AG10S-3.5-4	1/15/2019	**2.5**	**10**	**180**	**0.21**	**2.1**	**68**	**11**	**100**	**1000**	**0.11**	**0.66**	**48**	**1.1**	**0.13**	<0.35	**58**	**650**
DG-AG10 (D)	3.5-4	DG-AG10 (D)S-3.5-4	1/15/2019	**9.6**	**20**	**340**	**0.17**	**3.3**	**58**	**10**	**160**	**1500**	**0.23**	**0.72**	**39**	**1.6**	**0.15**	<0.37	**49**	**1500**
DG-AG11	0.5-1	DG-AG11S-0.5-1	1/21/2019	**1**	**26**	**68**	**0.089**	**0.51**	**25**	**5.8**	**70**	**190**	**0.1**	**0.42**	**21**	<0.38	**0.25**	<0.37	**39**	**130**
DG-AG11	3.5-4	DG-AG11S-3.5-4	1/21/2019	**3.1**	**87**	**79**	<0.12	**0.44**	**22**	**6.4**	**80**	**240**	**0.064**	<0.24	**25**	**0.96**	**0.52**	<0.54	**31**	**170**
DG-AG11	9.5-10	DG-AG11S-9.5-10	1/21/2019	**3.4**	**13**	**460**	**0.27**	**0.85**	**47**	**4.6**	**140**	**920**	**0.2**	<0.20	**37**	**0.76**	**1.7**	<0.45	**40**	**650**
DG-AG12	0.5-1	DG-AG12S-0.5-1	1/25/2019	**0.92**	**3.7**	**34**	**0.34**	**0.37**	**16**	**2**	**47**	**320**	**0.063**	**0.83**	**6.5**	**0.94**	<0.18	<0.52	**29**	**29**
DG-AG12	3.5-4	DG-AG12S-3.5-4	1/25/2019	**19**	**16**	**1100**	**0.6**	**2.7**	**45**	**7.9**	**3600**	**2600**	**0.67**	**0.98**	**410**	**1.8**	**4**	<0.57	**30**	**2900**
DG-AG12 (D)	3.5-4	DG-AG12 (D)S-3.5-4	1/25/2019	**23**	**19**	**1100**	**0.54**	**4**	**40**	**14**	**150**	**34**	**0.93**	<0.22	**2100**	**1.3**	**6.6**	<0.49	**29**	**82**
DG-AG13	0.5-1	DG-AG13S-0.5-1	1/25/2019	<0.27	**5**	**34**	**0.22**	**0.34**	**9.3**	**2.6**	**43**	**150**	**0.04**	**0.46**	**23**	<0.49	<0.17	<0.48	**28**	**51**
DG-AG13	3.5-4	DG-AG13S-3.5-4	1/25/2019	**22**	**24**	**1000**	**0.65**	**3.3**	**44**	**11**	**710**	**4000**	**0.17**	**1.1**	**40**	**1.9**	**4.9**	<0.56	**49**	**2200**
DG-AG14	0.5-1	DG-AG14S-0.5-1	2/5/2019	<0.22	**2.8**	**110**	**0.1**	**0.69**	**15**	**4**	**19**	**19**	**0.15**	**0.88**	**26**	<0.39	<0.13	**0.9**	**50**	**33**
DG-AG14	3.5-4	DG-AG14S-3.5-4	2/5/2019	**2.4**	**8.6**	**600**	**0.29**	<0.043	**32**	**21**	**50**	**22**	**0.073**	<0.22	**29**	**2**	<0.17	**1.6**	**130**	**91**
DG-AG14 (D)	3.5-4	DG-AG14 (D)S-3.5-4	2/5/2019	**1.3**	**26**	**120**	**0.24**	<0.045	**26**	**12**	**110**	**57**	**0.23**	<0.23	**21**	**1.2**	<0.18	**1.1**	**82**	**120**
DG-AG15	0.5-1	DG-AG15S-0.5-1	1/24/2019	**0.3**	**3.1**	**23**	**0.09**	**0.13**	**24**	**3.8**	**8.1**	**28**	**0.065**	<0.16	**20**	<0.38	<0.13	<0.36	**22**	**30**
DG-AG15	3.5-4	DG-AG15S-3.5-4	1/24/2019	**1.3**	**7**	**110**	**0.41**	**0.55**	**30**	**8.2**	**32**	**88**	**0.17**	**0.29**	**28**	<0.51	<0.17	<0.49	**40**	**150**
DG-AG15	8.5-9	DG-AG15S-8.5-9	1/24/2019	**1.4**	**5.1**	**73**	**0.24**	**1.2**	**31**	**8.8**	**28**	**70**	**0.024**	<0.25	**44**	**1.2**	**0.41**	<0.57	**28**	**250**
DG-AG16	0.5-1	DG-AG16S-0.5-1	1/22/2019	**2.1**	**6.5**	**110**	**0.89**	**0.35**	**37**	**15**	**32**	**18**	**0.065**	**0.2**	**35**	**2.2**	**0.17**	**1.2**	**54**	**58**
DG-AG16	3.5-4	DG-AG16S-3.5-4	1/22/2019	**1.1**	**6.6**	**56**	**0.21**	**0.22**	**38**	**8.2**	**16**	**20**	**0.18**	<0.18	**32**	**0.82**	<0.15	<0.42	**35**	**33**
DG-AG18	0.5-1	DG-AG18S-0.5-1	1/23/2019	<5.0	**7.1**	**120**	**0.47**	<0.25	**76**	**15**	**16**	**12**	**0.36**	<0.99	**49**	<1.7	<0.88	<5.0	**62**	**41**
DG-AG18	3.5-4	DG-AG18S-3.5-4	1/23/2019	<5.0	**4.7**	**93**	**0.35**	<0.25	**62**	**11**	**13**	**6.4**	**0.034**	<1.0	**44**	<1.7	<0.89	<5.0	**54**	**33**
DG-AG2	0.5-1	DG-AG2S-0.5-1	12/14/2018	**9.8**	**11**	**160**	<0.088	**2.4**	**31**	**8.9**	**270**	**350**	**0.52**	**1.9**	**33**	**0.99**	**0.86**	<0.39	**41**	**490**
DG-AG2	3.5-4	DG-AG2S-3.5-4	12/14/2018	**0.52**	**38**	**78**	**0.17**	**0.26**	**21**	**4.8**	**18**	**130**	**0.36**	**2**	**47**	<0.54	<0.18	<0.52	**49**	**53**
DG-AG2	4.5-5	DG-AG2S-4.5-5	12/14/2018	**1.1**	**14**	**25**	**0.4**	**0.21**	**29**	**14**	**21**	**17**	**0.037**	**0.64**	**25**	<0.50	<0.17	<0.48	**37**	**79**
DG-AG3	0.5-1	DG-AG3S-0.5-1	12/19/2018	**0.31**	**6.7**	**39**	<0.082	**0.14**	**8.5**	**11**	**95**	**20**	**0.085**	**0.53**	**6.1**	<0.38	<0.13	<0.36	**92**	**65**
DG-AG3	3.5-4	DG-AG3S-3.5-4	12/19/2018	**0.98**	**30**	**150**	**0.51**	**0.29**	**120**	**20**	**41**	**25**	**1**	**0.96**	**160**	**0.65**	<0.16	<0.45	**81**	**70**
DG-AG4	0.5-1	DG-AG4S-0.5-1	12/18/2018	**0.45**	**1.1**	**36**	**0.17**	**0.22**	**7.1**	**7.3**	**130**	**10**	**0.1**	**0.38**	**2.4**	<0.47	<0.16	<0.45	**79**	**44**
DG-AG4	3.5-4	DG-AG4S-3.5-4	12/18/2018	**1.5**	**16**	**100**	**0.18**	**0.28**	**60**	**7.5**	**13**	**15**	**0.063**	**0.43**	**46**	<0.58	<0.19	<0.56	**40**	**47**
DG-AG4 (D)	3.5-4	DG-AG4 (D)S-3.5-4	12/18/2018	**0.58**	**11**	**40**	**0.13**	**0.14**	**27**	**3.7**	**9.7**	**14**	**0.047**	**0.19**	**19**	<0.33	<0.11	<0.32	**19**	**24**
DG-AG4	11-11.5	DG-AG4S-11-11.5	12/18/2018	**1.4**	**11**	**53**	**0.46**	**0.2**	**49**	**19**	**25**	**11**	**0.031**	**2.2**	**43**	<0.33	<0.11	<0.32	**56**	**67**
DG-AG5	0.5-1	DG-AG5S-0.5-1	12/17/2018	**5.1**	**84**	**100**	<0.092	**0.87**	**20**	**10**	**160**	**230**	**0.31**	**0.91**	**20**	<0.43	**0.6**	<0.41	**74**	**250**
DG-AG5	3.5-4	DG-AG5S-3.5-4	12/17/2018	**3**	**220**	**64**	<0.069	**0.085**	**17**	**12**	**110**	**120**	**0.12**	**0.41**	**21**	<0.32	**0.35**	<0.31	**81**	**91**
DG-AG5 (D)	3.5-4	DG-AG5 (D)S-3.5-4	12/17/2018	**2.9**	**69**	**110**	<0.086	**0.8**	**24**	**11**	**220**	**310**	**0.2**	**0.66**	**24**	<0.40	**0.66**	<0.38	**79**	**280**
DG-AG6	0.5-1	DG-AG6S-0.5-1	12/20/2018	**1.2**	**2.1**	**17**	**0.095**	**0.56**	**20**	**16**	**130**	**48**	**0.083**	**0.58**	**13**	<0.43	<0.14	<0.41	**100**	**150**
DG-AG6	3.5-4	DG-AG6S-3.5-4	12/20/2018	**1.7**	**5.2**	**98**	**0.11**	**0.18**	**21**	**6.5**	**38**	**120**	**0.087**	**0.19**	**23**	<0.39	<0.13	<0.38	**35**	**100**
DG-AG7	0.5-1	DG-AG7S-0.5-1	1/30/2019	**0.47**	**2.4**	**67**	**0.38**	**0.78**	**20**	**12**	**160**	**100**	**0.31**	**0.72**	**14**	<0.41	<0.14	<0.40	**92**	**500**
DG-AG7	3.5-4	DG-AG7S-3.5-4	1/30/2019	<0.18	**10**	**85**	**0.17**	**0.41**	**20**	**4.9**	**45**	**85**	**0.043**	<0.14	**16**	**0.39**	**0.12**	<0.31	**32**	**110**
DG-AG8	0.5-1	DG-AG8S-0.5-1	1/31/2019	**0.3**	**1.2**	**51**	**0.26**	**0.12**	**16**	**8.2**	**53**	**6.2**	**0.085**	<0.15	**20**	**0.91**	<0.12	<0.35	**50**	**39**
DG-AG8	3.5-4	DG-AG8S-3.5-4	1/31/2019	**0.57**	**2.7**	**67**	**0.32**	**0.15**	**9.5**	**5.6**	**13**	**8.4**	**0.016**	<0.17	**9.3**	**0.4**	<0.13	<0.38	**53**	**35**
DG-AH10	0.5-1	DG-AH10S-0.5-1	1/15/2019	**2**	**7.8**	**130**	<0.096	**1.9**	**25**	**9.8**	**240**	**270**	**0.28**	**1.8**	**24**	**0.46**	**0.57**	<0.43	**86**	**620**
DG-AH10	3.5-4	DG-AH10S-3.5-4	1/15/2019	**2.4**	**5.5**	**83**	<0.067	**0.69**	**19**	**8.8**	**140**	**540**	**0.064**	**1.2**	**9**	**0.79**	<0.10	<0.30	**76**	**490**

Table 2: Metals Concentrations in Soil
UPC OU-2
Brisbane, California

Sample Location	Depth Range (ft bgs)	Sample Name	Collection Date	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
Direct Exposure Human Health Risk Level Residential Soil Exposure ESL [1]				1.1E+01	6.7E-02	1.5E+04	1.6E+01	7.8E+01	1.2E+05	2.3E+01	3.1E+03	8.0E+01	1.3E+01	3.9E+02	8.2E+02	3.9E+02	3.9E+02	7.8E-01	3.9E+02	2.3E+04
Regional Background [2]				5.5E+00	1.9E+01	3.2E+02	1.0E+00	2.7E+00	1.0E+02	2.5E+01	6.9E+01	1.6E+01	4.0E-01	7.4E+00	1.2E+02	5.6E+00	1.8E+00	7.6E+00	7.4E+01	1.1E+02
Units				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
DG-AH11	0.5-1	DG-AH11S-0.5-1	1/28/2019	**1.6**	**6.9**	**46**	<0.11	**0.4**	**27**	**5.8**	**48**	**130**	**0.081**	**0.36**	**20**	<0.50	**0.36**	<0.49	**34**	**81**
DG-AH11	3.5-4	DG-AH11S-3.5-4	1/28/2019	**0.87**	**8.2**	**30**	<0.11	**0.44**	**16**	**6.6**	**100**	**140**	**0.16**	**0.49**	**14**	<0.52	<0.18	<0.50	**44**	**86**
DG-AH12	0.5-1	DG-AH12S-0.5-1	1/25/2019	**0.87**	**5.1**	**64**	**0.23**	**0.43**	**24**	**5**	**140**	**150**	**0.031**	<0.25	**28**	<0.59	<0.20	<0.57	**37**	**180**
DG-AH12	3.5-4	DG-AH12S-3.5-4	1/25/2019	**100**	**19**	**980**	**0.61**	**1.8**	**31**	**6.5**	**110**	**410**	**0.74**	**1.2**	**42**	**0.61**	**5.3**	<0.50	**36**	**1600**
DG-AH13	0.5-1	DG-AH13S-0.5-1	1/29/2019	<0.26	**1**	**40**	<0.10	<0.039	**10**	**7.1**	**110**	**20**	**0.089**	<0.20	**6.5**	<0.48	<0.16	<0.46	**67**	**57**
DG-AH13	3.5-4	DG-AH13S-3.5-4	1/29/2019	**1.2**	**8.3**	**110**	**0.14**	**0.12**	**52**	**9.4**	**27**	**120**	**0.085**	**0.25**	**36**	**0.9**	<0.16	<0.46	**49**	**63**
DG-AH13	7.5-8	DG-AH13S-7.5-8	1/29/2019	**15**	**37**	**51**	**0.63**	**2.8**	**170**	**44**	**1200**	**1600**	**0.36**	**1**	**240**	<1.2	**1.7**	<1.1	**110**	**3200**
DG-AH14	0.5-1	DG-AH14S-0.5-1	2/5/2019	**0.55**	**8.2**	**180**	**0.53**	<0.037	**25**	**12**	**39**	**23**	**0.16**	<0.19	**50**	**1**	<0.15	**0.96**	**26**	**92**
DG-AH14	3.5-4	DG-AH14S-3.5-4	2/5/2019	**0.95**	**2.3**	**36**	**0.19**	<0.030	**50**	**7.7**	**5.7**	**6.3**	**0.036**	<0.15	**36**	**1.1**	<0.12	**0.45**	**42**	**24**
DG-AH15	0.5-1	DG-AH15S-0.5-1	1/22/2019	**1.8**	**8.6**	**170**	**0.78**	**0.44**	**37**	**13**	**38**	**62**	**0.28**	<0.20	**35**	**1.6**	<0.15	<0.44	**59**	**73**
DG-AH16	0.5-1	DG-AH16S-0.5-1	1/22/2019	**2.6**	**9.5**	**190**	**0.64**	**0.53**	**47**	**13**	**78**	**110**	**0.19**	<0.23	**43**	**2.3**	<0.18	<0.53	**56**	**130**
DG-AH16	3.5-4	DG-AH16S-3.5-4	1/22/2019	**1.8**	**5.8**	**70**	**0.66**	**0.2**	**37**	**7.5**	**26**	**32**	**0.075**	<0.14	**21**	**1.4**	<0.11	<0.32	**50**	**95**
DG-AH17	0.5-1	DG-AH17S-0.5-1	1/24/2019	**1.5**	**5.1**	**35**	**0.65**	**0.22**	**26**	**12**	**15**	**10**	**0.019**	<0.22	**25**	**1.1**	<0.18	<0.50	**34**	**75**
DG-AH2	0.5-1	DG-AH2S-0.5-1	12/14/2018	**3.9**	**8**	**84**	<0.12	**2.2**	**30**	**12**	**230**	**190**	**0.21**	**2.3**	**23**	<0.55	<0.19	<0.53	**110**	**420**
DG-AH2	3.5-4	DG-AH2S-3.5-4	12/14/2018	**0.41**	**21**	**86**	**0.24**	**0.13**	**30**	**8.6**	**13**	**14**	**0.11**	**0.32**	**40**	<0.46	<0.15	<0.44	**22**	**48**
DG-AH2 (D)	3.5-4	DG-AH2 (D)S-3.5-4	12/14/2018	<0.32	**30**	**96**	<0.13	**0.16**	**81**	**15**	**22**	**16**	**0.56**	**0.4**	**91**	<0.58	<0.20	<0.56	**53**	**62**
DG-AH3	0.5-1	DG-AH3S-0.5-1	12/14/2018	**0.49**	**6.7**	**68**	<0.080	**0.1**	**16**	**11**	**150**	**52**	**0.1**	**0.75**	**8**	**1.3**	<0.12	<0.36	**120**	**84**
DG-AH3	3.5-4	DG-AH3S-3.5-4	12/14/2018	**2.1**	**170**	**62**	**0.12**	**0.42**	**11**	**11**	**260**	**160**	**0.17**	**0.69**	**23**	**0.84**	<0.13	<0.37	**77**	**140**
DG-AH4	0.5-1	DG-AH4S-0.5-1	12/18/2018	**0.82**	**7.7**	**83**	<0.12	**1.1**	**17**	**9.8**	**110**	**93**	**0.085**	**1.1**	**21**	<0.54	<0.18	<0.52	**76**	**220**
DG-AH4	3.5-4	DG-AH4S-3.5-4	12/18/2018	<0.33	**29**	**36**	<0.13	**0.11**	**14**	**9.4**	**170**	**2.3**	**0.058**	**0.34**	**7.2**	<0.59	<0.20	<0.57	**100**	**50**
DG-AH4	6-6.5	DG-AH4S-6-6.5	12/18/2018	**0.54**	**12**	**27**	**0.18**	**0.11**	**35**	**10**	**22**	**11**	**0.044**	**0.88**	**24**	<0.48	<0.16	<0.47	**53**	**55**
DG-AH5	0.5-1	DG-AH5S-0.5-1	1/8/2019	**2**	**56**	**59**	<0.087	**0.37**	**16**	**9.8**	**120**	**180**	**0.081**	**0.27**	**19**	**1.8**	**0.24**	**1**	**78**	**130**
DG-AH5	3.5-4	DG-AH5S-3.5-4	1/8/2019	**6.4**	**310**	**71**	**0.14**	**0.76**	**21**	**11**	**200**	**280**	**0.21**	**0.74**	**27**	**3.1**	**0.68**	<0.37	**64**	**260**
DG-AH5	8-8.5	DG-AH5S-8-8.5	1/8/2019	**2.1**	**6**	**75**	**0.12**	<0.046	**45**	**11**	**24**	**12**	**0.035**	<0.24	**72**	**1.4**	<0.19	<0.54	**27**	**52**
DG-AH6	0.5-1	DG-AH6S-0.5-1	12/20/2018	**6.7**	**14**	**140**	<0.072	**6**	**67**	**13**	**370**	**450**	**0.49**	**5.2**	**68**	**0.49**	**0.66**	**0.44**	**59**	**1300**
DG-AH6	3.5-4	DG-AH6S-3.5-4	12/20/2018	**1.2**	**4.1**	**25**	<0.029	**0.26**	**9**	**2.6**	**44**	**77**	**0.49**	**0.45**	**8.8**	<0.13	<0.045	<0.13	**15**	**86**
DG-AH7	0.5-1	DG-AH7S-0.5-1	12/19/2018	**21**	**53**	**580**	**0.54**	**22**	**120**	**17**	**650**	**1800**	**2.8**	**24**	**130**	**2.3**	**2.8**	<1.8	**39**	**2500**
DG-AH7	3.5-4	DG-AH7S-3.5-4	12/19/2018	**0.6**	**3.7**	**74**	<0.12	**0.14**	**13**	**8.1**	**19**	**44**	**0.027**	**0.91**	**28**	<0.54	<0.18	<0.52	**35**	**45**
DG-AH8	0.5-1	DG-AH8S-0.5-1	1/30/2019	**0.56**	**1.6**	**49**	**0.4**	**0.15**	**11**	**13**	**150**	**27**	**0.082**	<0.15	**11**	<0.36	<0.12	<0.35	**100**	**86**
DG-AH8	3.5-4	DG-AH8S-3.5-4	1/30/2019	<0.17	**3.7**	**52**	**0.17**	**0.15**	**14**	**5.1**	**12**	**8.9**	**0.019**	**0.26**	**15**	**0.31**	<0.10	<0.30	**28**	**27**
DG-AH9	0.5-1	DG-AH9S-0.5-1	1/30/2019	**1.8**	**4.3**	**90**	**0.31**	**0.59**	**20**	**7.6**	**130**	**110**	**0.15**	**0.45**	**15**	<0.59	**0.25**	<0.57	**71**	**200**
DG-AH9	3.5-4	DG-AH9S-3.5-4	1/30/2019	<0.31	**4**	**85**	**0.17**	**0.15**	**15**	**5.2**	**32**	**210**	**0.041**	<0.24	**15**	**0.66**	<0.19	<0.55	**29**	**93**
DG-AI10	0.5-1	DG-AI10S-0.5-1	1/29/2019	**2.2**	**2**	**61**	<0.10	**0.72**	**55**	**9.6**	**110**	**650**	**0.11**	**0.92**	**9.9**	**0.72**	<0.16	<0.46	**85**	**250**
DG-AI10	3.5-4	DG-AI10S-3.5-4	1/29/2019	**1.1**	**3.5**	**45**	<0.12	**0.13**	**11**	**3.8**	**19**	**18**	**0.0084**	<0.24	**11**	**0.57**	<0.19	<0.55	**24**	**28**
DG-AI11	0.5-1	DG-AI11S-0.5-1	1/21/2019	<0.26	<0.27	**21**	<0.10	<0.039	**7.9**	**11**	**81**	**1.2**	**0.046**	<0.20	**6.9**	<0.48	<0.16	<0.46	**87**	**41**
DG-AI11 (D)	0.5-1	DG-AI11 (D)S-0.5-1	1/21/2019	**1.3**	**0.99**	**29**	<0.10	**0.23**	**9.5**	**14**	**92**	**13**	**0.067**	<0.21	**7.5**	<0.48	<0.16	<0.47	**98**	**55**
DG-AI11	3.5-4	DG-AI11S-3.5-4	1/21/2019	**3.2**	**15**	**250**	**0.19**	**0.8**	**18**	**7.1**	**160**	**540**	**0.31**	**0.64**	**20**	**1.1**	**1.1**	<0.52	**60**	**400**
DG-AI11	9.5-10	DG-AI11S-9.5-10	1/21/2019	**0.54**	**6.4**	**100**	**0.18**	**0.27**	**60**	**10**	**33**	**46**	**0.053**	**0.32**	**84**	<0.54	<0.18	<0.52	**41**	**67**
DG-AI12	0.5-1	DG-AI12S-0.5-1	1/25/2019	**0.37**	**8.2**	**36**	**0.21**	**0.46**	**11**	**4.7**	**51**	**82**	**0.032**	<0.26	**11**	**0.87**	<0.20	<0.58	**38**	**75**
DG-AI12	3.5-4	DG-AI12S-3.5-4	1/25/2019	**0.35**	**4.1**	**18**	**0.2**	**0.074**	**10**	**2.5**	**13**	**9.1**	**0.013**	<0.25	**15**	<0.58	<0.19	<0.56	**18**	**25**
DG-AI13	0.5-1	DG-AI13S-0.5-1	2/1/2019	<0.29	**3.3**	**16**	<0.11	**0.28**	**6.8**	**12**	**83**	**29**	**0.031**	<0.22	**7.5**	**1.4**	<0.17	**0.99**	**100**	**74**
DG-AI13	3.5-4	DG-AI13S-3.5-4	2/1/2019	<0.29	**33**	**31**	<0.11	**0.23**	**4.4**	**9.3**	**62**	**34**	**0.066**	<0.22	**10**	**0.73**	<0.18	<0.50	**62**	**83**
DG-AI13 (D)	3.5-4	DG-AI13 (D)S-3.5-4	2/1/2019	**1.3**	**73**	**31**	<0.11	**0.23**	**16**	**12**	**130**	**50**	**0.21**	<0.22	**20**	<0.53	<0.18	<0.51	**86**	**98**
DG-AI14	0.5-1	DG-AI14S-0.5-1	2/1/2019	**0.77**	**2.2**	**56**	**0.22**	**0.36**	**26**	**8.1**	**160**	**67**	**0.083**	<0.24	**39**	<0.56	**0.26**	<0.54	**75**	**220**
DG-AI14	3.5-4	DG-AI14S-3.5-4	2/1/2019	<0.22	**5.1**	**14**	**0.11**	**0.065**	**8.9**	**2.7**	**13**	**19**	**0.0087**	<0.17	**18**	<0.40	**0.14**	<0.39	**20**	**20**
DG-AI15	0.5-1	DG-AI15S-0.5-1	1/24/2019	**1.2**	**9.2**	**69**	**0.88**	**0.37**	**34**	**14**	**30**	**5.8**	**0.03**	**0.34**	**32**	**2.3**	**0.26**	<0.49	**50**	**50**
DG-AI15	3.5-4	DG-AI15S-3.5-4	1/24/2019	**1.6**	**8.3**	**93**	**0.28**	**0.33**	**34**	**5**	**20**	**8.1**	**0.042**	**0.4**	**26**	**1.8**	**0.21**	<0.57	**45**	**47**
DG-AI15 (D)	3.5-4	DG-AI15 (D)S-3.5-4	1/24/2019	**1.4**	**5.3**	**74**	**0.4**	**0.18**	**36**	**9.4**	**20**	**16**	**0.045**	**0.25**	**24**	**1.1**	<0.18	<0.50	**42**	**45**
DG-AI16	1-1.5	DG-AI16S-1-1.5	1/22/2019	**2.4**	**0.89**	**370**	**0.49**	**0.43**	**37**	**16**	**75**	**5.4**	**0.16**	<0.17	**31**	**1.8**	<0.13	<0.37	**82**	**57**
DG-AI17	0.5-1	DG-AI17S-0.5-1	1/22/2019	**3.1**	**15**	**92**	**1**	**0.72**	**48**	**18**	**49**	**25**	**0.029**	**0.26**	**47**	**2.3**	<0.17	<0.49	**59**	**180**
DG-AI17	3.5-4	DG-AI17S-3.5-4	1/22/2019	**2.4**	**9.1**	**26**	**0.94**	**0.94**	**36**	**19**	**59**	**230**	**0.19**	<0.22	**37**	**2**	<0.17	<0.50	**37**	**1500**
DG-AI2	0.5-1	DG-AI2S-0.5-1	12/14/2018	**1.3**	**55**	**92**	<0.11	**0.74**	**41**	**11**	**110**	**150**	**2**	**1.3**	**43**	<0.51	<0.17	<0.50	**70**	**170**

Table 2: Metals Concentrations in Soil
UPC OU-2
Brisbane, California

Sample Location	Depth Range (ft bgs)	Sample Name	Collection Date	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
Direct Exposure Human Health Risk Level Residential Soil Exposure ESL [1]				1.1E+01	6.7E-02	1.5E+04	1.6E+01	7.8E+01	1.2E+05	2.3E+01	3.1E+03	8.0E+01	1.3E+01	3.9E+02	8.2E+02	3.9E+02	3.9E+02	7.8E-01	3.9E+02	2.3E+04
Regional Background [2]				5.5E+00	1.9E+01	3.2E+02	1.0E+00	2.7E+00	1.0E+02	2.5E+01	6.9E+01	1.6E+01	4.0E-01	7.4E+00	1.2E+02	5.6E+00	1.8E+00	7.6E+00	7.4E+01	1.1E+02
Units				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
DG-AI2	3.5-4	DG-AI2S-3.5-4	12/14/2018	**0.49**	**69**	**33**	<0.094	**0.3**	**9.6**	**12**	**110**	**370**	**0.064**	**0.35**	**5.4**	<0.43	**0.22**	<0.42	**81**	**83**
DG-AI3	0.5-1	DG-AI3S-0.5-1	12/19/2018	<0.27	**0.62**	**38**	<0.11	**0.11**	**5.9**	**8.2**	**98**	**6.6**	**0.066**	**0.35**	**2.7**	<0.49	<0.16	<0.47	**75**	**35**
DG-AI3	3.5-4	DG-AI3S-3.5-4	12/19/2018	**0.76**	**59**	**220**	**0.41**	**0.12**	**33**	**18**	**48**	**29**	**0.21**	**0.82**	**47**	<0.41	<0.14	<0.39	**37**	**110**
DG-AI3 (D)	3.5-4	DG-AI3 (D)S-3.5-4	12/19/2018	**1.3**	**110**	**160**	**0.25**	**0.33**	**27**	**15**	**85**	**57**	**0.21**	**0.83**	**34**	<0.37	<0.12	<0.36	**62**	**170**
DG-AI4	0.5-1	DG-AI4S-0.5-1	12/18/2018	**1.2**	**6**	**62**	**0.14**	**0.56**	**12**	**8.9**	**150**	**50**	**0.07**	**0.85**	**15**	<0.54	<0.18	<0.52	**79**	**290**
DG-AI4	3.5-4	DG-AI4S-3.5-4	12/18/2018	**2**	**110**	**88**	<0.098	**0.44**	**25**	**9.7**	**130**	**190**	**0.11**	**0.97**	**19**	<0.45	<0.15	<0.44	**86**	**230**
DG-AI5	0.5-1	DG-AI5S-0.5-1	12/17/2018	**2.3**	**12**	**200**	**0.22**	**0.85**	**20**	**11**	**480**	**240**	**0.13**	**1.9**	**20**	<0.55	**0.58**	<0.53	**82**	**270**
DG-AI5	3.5-4	DG-AI5S-3.5-4	12/17/2018	**6.8**	**420**	**100**	<0.084	**1.7**	**21**	**13**	**250**	**240**	**0.13**	**0.81**	**29**	<0.39	**0.5**	<0.37	**73**	**320**
DG-AI6	0.5-1	DG-AI6S-0.5-1	12/20/2018	**0.86**	<0.26	**13**	**1.5**	**0.23**	**8.9**	**15**	**73**	**11**	**0.051**	**0.57**	**6**	<0.47	<0.16	<0.45	**120**	**58**
DG-AI6	3.5-4	DG-AI6S-3.5-4	12/20/2018	**6.8**	**13**	**340**	**1**	**3.1**	**31**	**12**	**140**	**630**	**0.42**	**3**	**28**	**0.92**	<0.17	<0.49	**84**	**430**
DG-AI7	0.5-1	DG-AI7S-0.5-1	1/9/2019	**40**	**16**	**360**	**0.36**	**10**	**960**	**26**	**1000**	**1400**	**8.1**	**44**	**550**	**6**	**2.2**	**0.79**	**60**	**2700**
DG-AI7	3.5-4	DG-AI7S-3.5-4	1/9/2019	**1.1**	**4.4**	**68**	**0.15**	**0.38**	**25**	**6.1**	**26**	**32**	**0.054**	**0.55**	**30**	**0.89**	<0.11	<0.31	**30**	**60**
DG-AI7	8-8.5	DG-AI7S-8-8.5	1/9/2019	**30**	**31**	**870**	**0.74**	**2.2**	**39**	**17**	**1700**	**4400**	**1.3**	**4.3**	**41**	**5.9**	**4.2**	**1.3**	**27**	**1600**
DG-AI8	0.5-1	DG-AI8S-0.5-1	1/30/2019	<0.19	**4.3**	**76**	**0.22**	**0.1**	**20**	**5.3**	**21**	**46**	**0.022**	<0.15	**19**	**0.71**	<0.12	<0.33	**32**	**62**
DG-AI8	3.5-4	DG-AI8S-3.5-4	1/30/2019	<0.19	**4.9**	**160**	**0.35**	**0.098**	**14**	**7.4**	**34**	**94**	**0.36**	**0.35**	**15**	<0.34	<0.11	<0.32	**68**	**86**
DG-AI9	0.5-1	DG-AI9S-0.5-1	1/30/2019	**5.3**	**8.8**	**110**	<0.11	**1.1**	**46**	**9.4**	**210**	**430**	**0.28**	**2.1**	**66**	**1.7**	<0.17	<0.48	**44**	**420**
DG-AI9	3.5-4	DG-AI9S-3.5-4	1/30/2019	**0.71**	**4.6**	**71**	<0.080	**0.12**	**16**	**5.1**	**22**	**54**	**0.032**	**0.49**	**18**	**0.51**	<0.12	<0.36	**30**	**87**
DG-AJ10	0.5-1	DG-AJ10S-0.5-1	1/15/2019	<0.19	**0.38**	**26**	<0.076	**0.21**	**26**	**11**	**86**	**41**	**0.041**	**0.61**	**340**	**0.71**	<0.12	<0.34	**84**	**53**
DG-AJ10	3.5-4	DG-AJ10S-3.5-4	1/15/2019	<0.19	**3.9**	**78**	**0.11**	**0.31**	**43**	**11**	**74**	**40**	**0.055**	**0.48**	**53**	**0.37**	<0.12	<0.34	**60**	**88**
DG-AJ11	0.5-1	DG-AJ11S-0.5-1	1/28/2019	**1.1**	**4.3**	**36**	<0.12	**0.21**	**31**	**6.2**	**14**	**27**	**0.043**	<0.23	**27**	**0.94**	<0.18	<0.51	**33**	**52**
DG-AJ11	3.5-4	DG-AJ11S-3.5-4	1/28/2019	**19**	**140**	**390**	<0.12	**1.9**	**76**	**12**	**350**	**1700**	**0.57**	<0.23	**34**	**1**	**1.4**	<0.53	**54**	**810**
DG-AJ12	0.5-1	DG-AJ12S-0.5-1	1/25/2019	**37**	**16**	**65**	**0.73**	**0.35**	**36**	**13**	**190**	**1200**	**0.35**	**0.63**	**44**	**0.89**	<0.19	<0.56	**48**	**150**
DG-AJ12 (D)	0.5-1	DG-AJ12 (D)S-0.5-1	1/25/2019	**14**	**17**	**51**	**0.56**	**0.6**	**66**	**16**	**250**	**2600**	**0.31**	**4.7**	**65**	**0.53**	<0.14	<0.41	**40**	**140**
DG-AJ12	3.5-4	DG-AJ12S-3.5-4	1/25/2019	**2.3**	**14**	**360**	**0.94**	**0.59**	**47**	**17**	**150**	**280**	**0.13**	**0.42**	**66**	**0.94**	**0.35**	<0.57	**49**	**690**
DG-AJ13	0.5-1	DG-AJ13S-0.5-1	1/29/2019	**0.5**	**190**	**44**	<0.12	**0.21**	**10**	**11**	**81**	**83**	**0.046**	<0.24	**15**	**0.7**	**0.63**	<0.54	**68**	**70**
DG-AJ13	3.5-4	DG-AJ13S-3.5-4	1/29/2019	**0.38**	**33**	**150**	**0.14**	**0.36**	**8.4**	**10**	**220**	**52**	**0.047**	<0.22	**10**	<0.53	**0.35**	<0.51	**77**	**380**
DG-AJ14	0.5-1	DG-AJ14S-0.5-1	1/22/2019	**2.5**	**5.4**	**92**	**0.41**	**0.4**	**90**	**15**	**27**	**27**	**0.052**	<0.18	**100**	**0.82**	<0.15	**0.63**	**69**	**56**
DG-AJ14	3.5-4	DG-AJ14S-3.5-4	1/22/2019	**1.7**	**2**	**80**	**0.17**	**0.18**	**56**	**6.1**	**7.6**	**5.6**	**0.014**	<0.13	**20**	**0.98**	<0.10	<0.29	**54**	**25**
DG-AJ15	0.5-1	DG-AJ15S-0.5-1	1/22/2019	**3.3**	**3.1**	**160**	**0.4**	**0.46**	**41**	**22**	**48**	**6.3**	**0.057**	<0.22	**32**	**2.1**	<0.17	<0.50	**120**	**71**
DG-AJ15	3.5-4	DG-AJ15S-3.5-4	1/22/2019	**2.6**	**2.2**	**66**	**0.21**	**0.41**	**88**	**6.3**	**13**	**2.6**	**0.068**	<0.20	**31**	**1.1**	<0.16	<0.45	**64**	**50**
DG-AJ17	0.5-1	DG-AJ17S-0.5-1	1/24/2019	**1.7**	**8.3**	**30**	**0.52**	**0.2**	**38**	**7.5**	**19**	**12**	**0.016**	<0.25	**30**	**0.86**	<0.19	<0.56	**45**	**71**
DG-AJ17	3.5-4	DG-AJ17S-3.5-4	1/24/2019	**2**	**7.6**	**54**	**0.43**	**0.26**	**49**	**9.2**	**18**	**6.9**	**0.018**	**0.22**	**30**	**1.5**	<0.15	<0.44	**52**	**60**
DG-AJ17	9.5-10	DG-AJ17S-9.5-10	1/24/2019	**1.3**	**5.1**	**90**	**0.41**	**0.22**	**67**	**9**	**16**	**5.5**	**0.013**	<0.18	**32**	**1.1**	<0.14	<0.41	**48**	**52**
DG-AJ2	0.5-1	DG-AJ2S-0.5-1	12/14/2018	<0.31	**13**	**44**	<0.12	**0.33**	**9.1**	**8.1**	**93**	**41**	**0.89**	**0.46**	**5.9**	<0.56	<0.19	<0.54	**66**	**110**
DG-AJ2	3.5-4	DG-AJ2S-3.5-4	12/14/2018	**7.2**	**180**	**120**	**0.34**	**0.2**	**32**	**10**	**110**	**960**	**1.3**	**0.47**	**40**	<0.54	<0.18	<0.52	**49**	**110**
DG-AJ3	0.5-1	DG-AJ3S-0.5-1	12/14/2018	**0.59**	**16**	**56**	<0.11	**0.18**	**12**	**9.2**	**140**	**26**	**0.072**	**0.38**	**4.9**	**1.7**	<0.17	<0.48	**110**	**68**
DG-AJ3	3.5-4	DG-AJ3S-3.5-4	12/14/2018	**0.33**	**66**	**73**	<0.096	<0.037	**14**	**14**	**110**	**11**	**0.06**	**0.74**	**7.5**	**0.84**	<0.15	<0.43	**90**	**60**
DG-AJ4	0.5-1	DG-AJ4S-0.5-1	12/18/2018	**0.92**	**6.9**	**81**	<0.11	**0.61**	**18**	**12**	**110**	**250**	**0.072**	**1.1**	**17**	<0.52	**0.43**	<0.50	**100**	**160**
DG-AJ4	3.5-4	DG-AJ4S-3.5-4	12/18/2018	<0.19	**27**	**29**	<0.073	**0.11**	**15**	**11**	**150**	**20**	**0.088**	**0.41**	**4.9**	<0.34	<0.11	<0.33	**100**	**69**
DG-AJ5	0.5-1	DG-AJ5S-0.5-1	1/8/2019	**1**	**2.6**	**45**	**0.086**	**0.51**	**14**	**9.4**	**130**	**41**	**0.11**	**0.53**	**7.7**	**1.6**	<0.13	<0.36	**87**	**120**
DG-AJ5	3.5-4	DG-AJ5S-3.5-4	1/8/2019	**11**	**620**	**80**	<0.23	**2.1**	**29**	**10**	**150**	**270**	**0.91**	**0.89**	**37**	**3.3**	<0.36	<1.0	**36**	**670**
DG-AJ6	0.5-1	DG-AJ6S-0.5-1	12/20/2018	**1.1**	**0.54**	**17**	**1.7**	**0.14**	**12**	**17**	**800**	**3**	**0.063**	**0.77**	**5.7**	**1.7**	<0.14	<0.39	**140**	**55**
DG-AJ6 (D)	0.5-1	DG-AJ6 (D)S-0.5-1	12/20/2018	**2.2**	**1.2**	**25**	**1.5**	**0.68**	**16**	**17**	**180**	**70**	**0.1**	**1.3**	**11**	**0.94**	<0.19	<0.55	**130**	**140**
DG-AJ6	3.5-4	DG-AJ6S-3.5-4	12/20/2018	**12**	**21**	**220**	**0.72**	**18**	**52**	**9.3**	**190**	**620**	**0.46**	**2.7**	**41**	**1.1**	**1.7**	<0.46	**49**	**750**
DG-AJ7	0.5-1	DG-AJ7S-0.5-1	12/19/2018	**38**	**25**	**290**	<0.12	**9.8**	**230**	**20**	**1200**	**3000**	**2**	**40**	**180**	<1.4	**2.5**	<1.3	**41**	**2000**
DG-AJ7	3.5-4	DG-AJ7S-3.5-4	12/19/2018	**1.4**	**3.2**	**93**	<0.13	**0.33**	**19**	**5.6**	**29**	**81**	**0.093**	**0.77**	**18**	<0.58	<0.19	<0.56	**31**	**100**
DG-AJ8	0.5-1	DG-AJ8S-0.5-1	1/30/2019	**4.1**	**13**	**140**	<0.18	**6.3**	**45**	**18**	**330**	**460**	**0.3**	**3.9**	**46**	**1.3**	**0.41**	<0.81	**91**	**650**
DG-AJ8	3.5-4	DG-AJ8S-3.5-4	1/30/2019	**0.6**	**4**	**61**	<0.11	**0.053**	**23**	**6.2**	**21**	**25**	**0.029**	**0.37**	**24**	<0.52	<0.17	<0.50	**33**	**40**
DG-AJ9	0.5-1	DG-AJ9S-0.5-1	1/30/2019	**9.5**	**20**	**250**	**0.24**	**3.7**	**62**	**9.8**	**500**	**710**	**0.34**	**3.9**	**61**	<0.41	**1.2**	<0.40	**35**	**830**
DG-AJ9	3.5-4	DG-AJ9S-3.5-4	1/30/2019	<0.28	**4**	**72**	**0.25**	**0.064**	**20**	**5.2**	**17**	**22**	**0.025**	<0.21	**18**	**0.57**	<0.17	<0.48	**35**	**43**
DG-AK10	0.5-1	DG-AK10S-0.5-1	1/15/2019	**2.6**	**4.7**	**58**	<0.12	**1.1**	**39**	**9.4**	**130**	**300**	**0.88**	**1.5**	**13**	**1.1**	<0.19	<0.54	**81**	**490**
DG-AK10	3.5-4	DG-AK10S-3.5-4	1/15/2019	**0.74**	**7**	**55**	<0.095	**0.3**	**18**	**5.1**	**25**	**120**	**0.029**	**1**	**17**	<0.44	<0.15	<0.42	**30**	**78**

Table 2: Metals Concentrations in Soil
UPC OU-2
Brisbane, California

Sample Location	Depth Range (ft bgs)	Sample Name	Collection Date	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
Direct Exposure Human Health Risk Level Residential Soil Exposure ESL [1]				1.1E+01	6.7E-02	1.5E+04	1.6E+01	7.8E+01	1.2E+05	2.3E+01	3.1E+03	8.0E+01	1.3E+01	3.9E+02	8.2E+02	3.9E+02	3.9E+02	7.8E-01	3.9E+02	2.3E+04
Regional Background [2]				5.5E+00	1.9E+01	3.2E+02	1.0E+00	2.7E+00	1.0E+02	2.5E+01	6.9E+01	1.6E+01	4.0E-01	7.4E+00	1.2E+02	5.6E+00	1.8E+00	7.6E+00	7.4E+01	1.1E+02
Units				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
DG-AK11	0.5-1	DG-AK11S-0.5-1	1/22/2019	**0.22**	<0.22	**15**	<0.083	**0.13**	**84**	**12**	**74**	**2.3**	**0.049**	<0.16	**7.6**	<0.38	<0.13	<0.37	**84**	**47**
DG-AK11	3.5-4	DG-AK11S-3.5-4	1/22/2019	**15**	**31**	**490**	<0.28	**7.3**	**47**	**10**	**580**	**1800**	**0.25**	**1.3**	**53**	<1.3	**0.99**	<1.3	**44**	**1300**
DG-AK12	0.5-1	DG-AK12S-0.5-1	1/25/2019	**0.62**	**11**	**48**	**0.12**	**0.41**	**21**	**4.9**	**39**	**100**	**0.061**	<0.20	**19**	<0.46	<0.15	<0.44	**36**	**88**
DG-AK12	3.5-4	DG-AK12S-3.5-4	1/25/2019	**14**	**10**	**440**	**0.69**	**0.89**	**61**	**13**	**140**	**960**	**0.72**	<0.25	**61**	<0.58	**0.59**	<0.56	**51**	**520**
DG-AK13	0.5-1	DG-AK13S-0.5-1	1/25/2019	**2.8**	**40**	**100**	**0.28**	**0.8**	**27**	**11**	**200**	**300**	**0.17**	<0.21	**23**	**0.92**	**2.3**	<0.47	**87**	**300**
DG-AK13	3.5-4	DG-AK13S-3.5-4	1/25/2019	**4.3**	**290**	**420**	**0.4**	**0.76**	**14**	**12**	**140**	**200**	**1.7**	**1.1**	**14**	<1.1	**0.66**	<1.1	**87**	**210**
DG-AK14	0.5-1	DG-AK14S-0.5-1	1/22/2019	**3.7**	**19**	**130**	<0.090	**1**	**390**	**8.8**	**130**	**230**	**0.29**	<0.18	**27**	<0.41	**0.37**	<0.40	**59**	**330**
DG-AK14	3.5-4	DG-AK14S-3.5-4	1/22/2019	**0.91**	**1.7**	**110**	<0.12	**0.24**	**42**	**22**	**42**	**11**	**0.051**	<0.24	**35**	**1.2**	**0.24**	<0.54	**120**	**65**
DG-AK14 (D)	3.5-4	DG-AK14 (D)S-3.5-4	1/22/2019	**4.1**	**17**	**99**	**0.85**	**0.86**	**180**	**14**	**94**	**76**	**0.47**	**0.4**	**33**	**2.4**	<0.16	**0.75**	**63**	**210**
DG-AK15	0.5-1	DG-AK15S-0.5-1	1/23/2019	<5.0	**5.3**	**140**	**0.29**	<0.25	**52**	**8.6**	**120**	**46**	**0.11**	<1.0	**85**	**1.7**	<0.89	<5.0	**32**	**140**
DG-AK15	3.5-4	DG-AK15S-3.5-4	1/23/2019	<5.0	**7.8**	**100**	**0.63**	**1.8**	**34**	**8.7**	**43**	**45**	**0.21**	<1.0	**25**	**1.7**	<0.89	<5.0	**37**	**660**
DG-AK16	0.5-1	DG-AK16S-0.5-1	1/22/2019	<0.29	**4.5**	**63**	<0.12	**0.25**	**63**	**7**	**21**	**50**	**0.18**	<0.23	**33**	<0.53	**0.2**	<0.51	**46**	**91**
DG-AK16 (D)	0.5-1	DG-AK16 (D)S-0.5-1	1/22/2019	**3.3**	**9.8**	**130**	**0.5**	**0.53**	**52**	**16**	**45**	**66**	**0.16**	**0.16**	**32**	**1.6**	<0.12	**0.62**	**53**	**110**
DG-AK16	3.5-4	DG-AK16S-3.5-4	1/22/2019	**1.2**	**11**	**130**	**0.35**	**0.46**	**48**	**13**	**25**	**49**	**0.19**	**0.23**	**30**	**0.84**	<0.12	**0.46**	**49**	**76**
DG-AK2	0.5-1	DG-AK2S-0.5-1	12/14/2018	**1.2**	**7.7**	**86**	<0.088	**0.8**	**14**	**10**	**130**	**130**	**0.13**	**0.91**	**11**	**0.54**	<0.14	<0.39	**89**	**190**
DG-AK2	3.5-4	DG-AK2S-3.5-4	12/14/2018	**0.7**	**45**	**32**	<0.070	**0.2**	**7.9**	**11**	**84**	**15**	**0.071**	**0.55**	**4.7**	<0.32	<0.11	<0.31	**79**	**73**
DG-AK3	0.5-1	DG-AK3S-0.5-1	12/19/2018	**0.81**	**1.6**	**53**	**0.28**	**0.2**	**11**	**10**	**150**	**26**	**0.35**	**0.92**	**5.6**	**0.62**	<0.11	<0.32	**98**	**69**
DG-AK3	3.5-4	DG-AK3S-3.5-4	12/19/2018	**1.3**	**85**	**300**	**0.52**	**0.26**	**35**	**10**	**63**	**180**	**0.31**	**1.1**	**34**	<0.43	**0.23**	<0.42	**43**	**210**
DG-AK4	0.5-1	DG-AK4S-0.5-1	12/18/2018	<0.28	**4.1**	**74**	**0.19**	**0.13**	**7.5**	**13**	**100**	**3.5**	**0.046**	**0.49**	**4.1**	<0.51	<0.17	<0.50	**110**	**49**
DG-AK4 (D)	0.5-1	DG-AK4 (D)S-0.5-1	12/18/2018	**0.6**	**2.6**	**68**	**0.18**	**0.17**	**11**	**15**	**120**	**11**	**0.063**	**0.95**	**8**	<0.38	<0.13	<0.37	**120**	**70**
DG-AK4	3.5-4	DG-AK4S-3.5-4	12/18/2018	**2.1**	**160**	**60**	**0.19**	**0.95**	**18**	**9.9**	**850**	**210**	**0.091**	**0.6**	**14**	**1**	<0.17	<0.50	**59**	**450**
DG-AK5	0.5-1	DG-AK5S-0.5-1	12/17/2018	**2.9**	**7.7**	**91**	<0.11	**4**	**81**	**10**	**260**	**520**	**0.48**	**2.3**	**19**	<0.50	**0.5**	<0.49	**66**	**1000**
DG-AK5	3.5-4	DG-AK5S-3.5-4	12/17/2018	**4**	**230**	**85**	<0.26	**0.95**	**16**	**7.9**	**300**	**370**	**0.19**	**0.56**	**21**	<1.2	<0.40	<1.2	**49**	**320**
DG-AK6	0.5-1	DG-AK6S-0.5-1	12/20/2018	**1.4**	**0.82**	**5.7**	**1.6**	**0.22**	**13**	**21**	**140**	**3.1**	**0.055**	**0.79**	**7.7**	**0.57**	<0.17	<0.48	**130**	**66**
DG-AK6	3.5-4	DG-AK6S-3.5-4	12/20/2018	**12**	**14**	**240**	**0.37**	**2.4**	**49**	**10**	**190**	**330**	**0.68**	**4.2**	**50**	**1.4**	<0.13	<0.37	**33**	**690**
DG-AK7	0.5-1	DG-AK7S-0.5-1	1/9/2019	**23**	**19**	**270**	**0.33**	**8.1**	**140**	**38**	**690**	**960**	**2.3**	**28**	**120**	**1.6**	**1.1**	**1.7**	**38**	**1400**
DG-AK7	3.5-4	DG-AK7S-3.5-4	1/9/2019	**4.4**	**4.8**	**140**	**0.14**	**0.3**	**15**	**5.8**	**77**	**290**	**0.38**	**0.61**	**18**	**0.65**	**0.34**	<0.55	**26**	**230**
DG-AK7 (D)	3.5-4	DG-AK7 (D)S-3.5-4	1/9/2019	**0.76**	**3**	**65**	**0.12**	**0.096**	**13**	**4.4**	**20**	**44**	**0.04**	**0.37**	**14**	**0.57**	**0.18**	<0.37	**24**	**58**
DG-AK8	0.5-1	DG-AK8S-0.5-1	2/1/2019	**0.46**	**0.84**	**56**	<0.076	**0.57**	**24**	**9.5**	**120**	**69**	**0.55**	<0.15	**6.3**	**0.37**	**0.13**	**0.46**	**86**	**140**
DG-AK8	3.5-4	DG-AK8S-3.5-4	2/1/2019	<0.19	**5.3**	**62**	<0.073	**0.22**	**14**	**4.3**	**12**	**17**	**0.037**	<0.14	**14**	**0.41**	<0.11	<0.33	**19**	**32**
DG-AK9	0.5-1	DG-AK9S-0.5-1	1/30/2019	**7.4**	**15**	**220**	<0.11	**2.4**	**52**	**8.2**	**230**	**390**	**0.64**	**1.9**	**51**	**2.1**	**0.27**	**0.51**	**35**	**620**
DG-AK9	3.5-4	DG-AK9S-3.5-4	1/30/2019	**1**	**6.7**	**79**	<0.10	**0.15**	**16**	**4.6**	**22**	**170**	**0.03**	**0.73**	**19**	<0.48	<0.16	<0.47	**27**	**70**
DG-AL10	0.5-1	DG-AL10S-0.5-1	1/15/2019	<0.17	**0.45**	**30**	<0.067	**0.14**	**11**	**9.6**	**120**	**6.4**	**0.068**	**0.52**	**3.9**	**0.69**	<0.10	<0.30	**100**	**50**
DG-AL10	3.5-4	DG-AL10S-3.5-4	1/15/2019	<0.27	**6.3**	**41**	<0.11	**0.3**	**20**	**5.4**	**21**	**30**	**0.025**	**0.4**	**15**	<0.49	<0.17	<0.48	**33**	**47**
DG-AL11	0.5-1	DG-AL11S-0.5-1	1/28/2019	**1.3**	**4.4**	**49**	<0.12	**0.23**	**33**	**6.1**	**17**	**36**	**0.046**	<0.23	**27**	<0.54	<0.18	<0.52	**31**	**61**
DG-AL11	3.5-4	DG-AL11S-3.5-4	1/28/2019	**1.9**	**1.3**	**18**	<0.13	**0.18**	**7.8**	**14**	**83**	**3.1**	**0.059**	<0.25	**5**	**0.85**	<0.20	<0.57	**93**	**54**
DG-AL12	0.5-1	DG-AL12S-0.5-1	1/25/2019	**0.6**	**8.8**	**57**	<0.12	**0.48**	**20**	**3.5**	**31**	**150**	**0.04**	<0.23	**22**	<0.54	<0.18	<0.52	**23**	**110**
DG-AL12	3.5-4	DG-AL12S-3.5-4	1/25/2019	**10**	**13**	**730**	**0.51**	**1.4**	**31**	**6.4**	**580**	**2000**	**1.1**	**0.82**	**37**	<0.36	**1.6**	<0.35	**60**	**990**
DG-AL13	0.5-1	DG-AL13S-0.5-1	1/29/2019	**0.93**	**7.5**	**38**	**0.12**	**0.29**	**14**	**15**	**120**	**52**	**0.046**	**0.28**	**18**	**0.98**	<0.12	<0.34	**91**	**110**
DG-AL13	3.5-4	DG-AL13S-3.5-4	1/29/2019	<0.23	**0.86**	**26**	**0.15**	<0.034	**7.9**	**8.8**	**89**	**4.8**	**0.043**	<0.18	**3.8**	<0.41	<0.14	<0.40	**78**	**35**
DG-AL14	0.5-1	DG-AL14S-0.5-1	1/22/2019	**1.2**	**13**	**61**	**0.86**	**0.19**	**53**	**17**	**30**	**5.1**	**0.032**	**4.3**	**38**	**1.3**	**0.48**	<0.46	**57**	**63**
DG-AL14 (D)	0.5-1	DG-AL14 (D)S-0.5-1	1/22/2019	**1.9**	**7.7**	**51**	**0.92**	**0.35**	**39**	**14**	**38**	**4.7**	**0.025**	<0.16	**29**	**2**	**0.18**	**0.69**	**55**	**55**
DG-AL14	3.5-4	DG-AL14S-3.5-4	1/22/2019	**1.2**	**3.7**	**80**	**0.1**	**0.14**	**67**	**8.8**	**21**	**11**	**0.11**	<0.18	**36**	**0.46**	<0.14	<0.41	**62**	**35**
DG-AL15	1-1.5	DG-AL15S-1-1.5	1/22/2019	**3.6**	**5**	**170**	**0.32**	**0.63**	**230**	**9.2**	**57**	**87**	**0.28**	**0.18**	**36**	**0.64**	<0.11	<0.32	**45**	**250**
DG-AL16	0.5-1	DG-AL16S-0.5-1	1/22/2019	**4.4**	**5.9**	**150**	**0.3**	**1.5**	**160**	**9.8**	**49**	**390**	**0.14**	**4.9**	**44**	**1.2**	**3.4**	<0.46	**44**	**320**
DG-AL2	0.5-1	DG-AL2S-0.5-1	12/17/2018	<0.25	**7.2**	**37**	<0.097	<0.037	**6.3**	**7.1**	**110**	**9.9**	**0.078**	**0.27**	**2.6**	<0.45	<0.15	<0.43	**70**	**36**
DG-AL2	3.5-4	DG-AL2S-3.5-4	12/17/2018	**3**	**280**	**71**	**0.11**	**0.62**	**23**	**11**	**250**	**230**	**0.28**	**0.25**	**16**	<0.43	**0.23**	<0.41	**72**	**200**
DG-AL2	7.5-8	DG-AL2S-7.5-8	12/17/2018	**1.9**	**35**	**76**	**0.29**	**0.045**	**64**	**16**	**29**	**5.3**	**0.31**	<0.18	**81**	<0.43	<0.14	<0.41	**52**	**56**
DG-AL3	0.5-1	DG-AL3S-0.5-1	11/21/2018	**2.4**	**11**	**76**	<0.099	**0.92**	**9.5**	**7.5**	**160**	**420**	**0.35**	**0.52**	**9.3**	<0.46	**0.91**	<0.44	**75**	**240**
DG-AL3	3.5-4	DG-AL3S-3.5-4	11/21/2018	**4.1**	**310**	**39**	<0.094	**0.46**	**11**	**9.5**	**120**	**200**	**0.089**	<0.19	**15**	<0.43	**0.95**	<0.42	**79**	**130**
DG-AL3 (D)	3.5-4	DG-AL3 (D)S-3.5-4	11/21/2018	**1.2**	**97**	**42**	<0.12	**0.31**	**8.6**	**10**	**77**	**40**	**0.13**	**0.37**	**6.7**	<0.55	**0.64**	<0.53	**91**	**69**
DG-AL4	0.5-1	DG-AL4S-0.5-1	12/18/2018	**0.44**	**72**	**86**	**0.096**	**0.15**	**12**	**7.7**	**120**	**59**	**0.28**	**0.5**	**5**	<0.44	<0.15	<0.42	**80**	**200**

Table 2: Metals Concentrations in Soil
UPC OU-2
Brisbane, California

Sample Location	Depth Range (ft bgs)	Sample Name	Collection Date	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
Direct Exposure Human Health Risk Level Residential Soil Exposure ESL [1]				1.1E+01	6.7E-02	1.5E+04	1.6E+01	7.8E+01	1.2E+05	2.3E+01	3.1E+03	8.0E+01	1.3E+01	3.9E+02	8.2E+02	3.9E+02	3.9E+02	7.8E-01	3.9E+02	2.3E+04
Regional Background [2]				5.5E+00	1.9E+01	3.2E+02	1.0E+00	2.7E+00	1.0E+02	2.5E+01	6.9E+01	1.6E+01	4.0E-01	7.4E+00	1.2E+02	5.6E+00	1.8E+00	7.6E+00	7.4E+01	1.1E+02
Units				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
DG-AL4	3.5-4	DG-AL4S-3.5-4	12/18/2018	**3.2**	**17**	**110**	<0.081	**2.9**	**37**	**9.2**	**120**	**260**	**0.28**	**2.9**	**47**	<0.37	**0.42**	<0.36	**35**	**330**
DG-AL4	7.5-8	DG-AL4S-7.5-8	12/18/2018	**4.9**	**27**	**290**	**0.56**	**0.18**	**25**	**11**	**41**	**260**	**0.16**	**0.28**	**32**	<0.57	**0.67**	<0.55	**28**	**160**
DG-AL5	0.5-1	DG-AL5S-0.5-1	1/30/2019	**2.5**	**9.1**	**96**	<0.10	**1.2**	**26**	**8.5**	**140**	**220**	**0.34**	**2.4**	**29**	**1.6**	**0.47**	<0.45	**52**	**240**
DG-AL5	3.5-4	DG-AL5S-3.5-4	1/30/2019	**5.4**	**68**	**66**	**0.23**	**1.1**	**22**	**7.5**	**320**	**330**	**0.4**	**1.6**	**30**	<0.47	**0.29**	<0.45	**47**	**350**
DG-AL5 (D)	3.5-4	DG-AL5 (D)S-3.5-4	1/30/2019	**4.1**	**75**	**100**	**0.25**	**1.4**	**27**	**8.1**	**260**	**370**	**0.55**	**1.5**	**34**	**0.6**	**0.17**	<0.37	**56**	**420**
DG-AL6	0.5-1	DG-AL6S-0.5-1	12/20/2018	**1.7**	**1.8**	**27**	**1.6**	**0.85**	**21**	**19**	**170**	**80**	**0.12**	**1.5**	**14**	**1.2**	<0.16	<0.46	**130**	**170**
DG-AL6	3.5-4	DG-AL6S-3.5-4	12/20/2018	**3.2**	**35**	**100**	**1.3**	**1.2**	**30**	**14**	**150**	**200**	**0.18**	**1.5**	**23**	**0.62**	<0.19	<0.55	**100**	**290**
DG-AL7	0.5-1	DG-AL7S-0.5-1	12/19/2018	**20**	**17**	**300**	<0.078	**12**	**300**	**16**	**390**	**1000**	**0.059**	**67**	**240**	**1.6**	**0.62**	<0.87	**34**	**1200**
DG-AL7	3.5-4	DG-AL7S-3.5-4	12/19/2018	**0.93**	**6.4**	**85**	<0.12	**0.13**	**16**	**6.6**	**22**	**32**	**0.036**	**0.7**	**22**	<0.54	<0.18	<0.52	**40**	**140**
DG-AL7	14.5-15	DG-AL7S-14.5-15	12/19/2018	**7.7**	**17**	**440**	**0.26**	**1.7**	**49**	**8.2**	**220**	**1200**	**0.063**	**0.52**	**36**	**1.7**	**1.3**	<1.1	**34**	**1100**
DG-AL8	0.5-1	DG-AL8S-0.5-1	1/30/2019	**5.7**	**21**	**110**	**0.41**	**3.8**	**39**	**12**	**310**	**230**	**0.63**	**1.9**	**53**	**0.96**	**0.66**	<0.53	**61**	**420**
DG-AL8	3.5-4	DG-AL8S-3.5-4	1/30/2019	**0.88**	**5.1**	**75**	**0.18**	**0.21**	**13**	**4.6**	**29**	**55**	**0.038**	**0.28**	**14**	**0.99**	<0.12	<0.33	**26**	**120**
DG-AL9	0.5-1	DG-AL9S-0.5-1	1/21/2019	**2.9**	**9.9**	**83**	<0.073	**1.1**	**30**	**8.9**	**120**	**170**	**0.19**	**1.1**	**30**	<0.34	**0.41**	**0.38**	**43**	**270**
DG-AL9	3.5-4	DG-AL9S-3.5-4	1/21/2019	**23**	**22**	**1300**	**0.31**	**2.9**	**47**	**7.6**	**530**	**4600**	**0.51**	**0.25**	**42**	<0.47	**6.2**	<0.45	**29**	**3800**
DG-AL9	7-7.5	DG-AL9S-7-7.5	1/21/2019	**3.4**	**9.9**	**100**	**0.44**	**0.57**	**24**	**12**	**49**	**18**	**0.027**	<0.23	**34**	<0.55	<0.18	<0.53	**31**	**130**
DG-AL9 (D)	7-7.5	DG-AL9 (D)S-7-7.5	1/21/2019	**3**	**14**	**110**	**0.88**	**0.72**	**36**	**22**	**73**	**37**	**0.053**	<0.20	**48**	<0.47	<0.16	<0.45	**42**	**410**
DG-AM10	0.5-1	DG-AM10S-0.5-1	1/15/2019	**0.32**	**4**	**67**	<0.086	**0.84**	**17**	**6.9**	**92**	**120**	**0.26**	**1.1**	**11**	<0.39	<0.13	<0.38	**48**	**270**
DG-AM10 (D)	0.5-1	DG-AM10 (D)S-0.5-1	1/15/2019	**0.54**	**0.41**	**36**	<0.10	**0.12**	**10**	**9.4**	**100**	**3.3**	**0.06**	<0.20	**3.6**	<0.48	<0.16	<0.46	**100**	**31**
DG-AM10	3.5-4	DG-AM10S-3.5-4	1/15/2019	<0.19	**0.49**	**30**	<0.073	**0.08**	**16**	**9.6**	**190**	**30**	**0.064**	**0.7**	**4.7**	**0.4**	<0.11	<0.32	**83**	**140**
DG-AM11	0.5-1	DG-AM11S-0.5-1	1/22/2019	<0.29	<0.30	**15**	**0.2**	**0.082**	**8.4**	**13**	**76**	**1.9**	**0.044**	**0.36**	**5.5**	**1.5**	<0.18	**1.7**	**96**	**46**
DG-AM11	3.5-4	DG-AM11S-3.5-4	1/22/2019	**12**	**12**	**300**	**0.45**	**1.4**	**47**	**9**	**1500**	**700**	**0.13**	<0.33	**32**	**1.7**	**3.5**	<0.75	**37**	**1300**
DG-AM12	0.5-1	DG-AM12S-0.5-1	1/25/2019	**1.3**	**5.3**	**32**	**0.12**	**0.23**	**13**	**2.8**	**22**	**64**	**0.033**	<0.18	**12**	<0.43	<0.14	<0.41	**15**	**57**
DG-AM12	3.5-4	DG-AM12S-3.5-4	1/25/2019	**2.2**	**12**	**170**	**0.55**	**0.42**	**53**	**12**	**81**	**110**	**0.11**	**0.16**	**39**	**0.54**	<0.12	<0.35	**50**	**400**
DG-AM12 (D)	3.5-4	DG-AM12 (D)S-3.5-4	1/25/2019	**2.8**	**12**	**250**	**0.47**	**0.6**	**58**	**13**	**160**	**320**	**0.08**	<0.23	**41**	**1.4**	**0.79**	<0.52	**47**	**590**
DG-AM13	0.5-1	DG-AM13S-0.5-1	1/31/2019	**10**	**35**	**130**	<0.090	**1.1**	**21**	**7.8**	**81**	**220**	**0.2**	**0.52**	**21**	<1.0	<0.35	<1.0	**33**	**250**
DG-AM13 (D)	0.5-1	DG-AM13 (D)S-0.5-1	1/31/2019	**8.8**	**21**	**150**	<0.092	**0.69**	**17**	**5.9**	**160**	**290**	**0.11**	**0.2**	**19**	<0.43	**0.44**	<0.41	**35**	**270**
DG-AM13	3.5-4	DG-AM13S-3.5-4	1/31/2019	**6.2**	**17**	**370**	<0.29	**0.79**	**19**	**3.7**	**220**	**960**	**0.19**	<0.57	**18**	<1.3	**1.9**	<1.3	**20**	**660**
DG-AM14	1-1.5	DG-AM14S-1-1.5	1/22/2019	**0.5**	**5.4**	**47**	<0.098	**0.12**	**77**	**9.3**	**32**	**12**	**0.021**	<0.19	**41**	<0.45	<0.15	<0.44	**60**	**34**
DG-AM15	0.5-1	DG-AM15S-0.5-1	1/23/2019	<5.0	**7.4**	**30**	**0.74**	<0.25	**30**	**12**	**16**	**4.3**	**0.042**	<0.99	**28**	<1.7	<0.88	<5.0	**43**	**42**
DG-AM15	3.5-4	DG-AM15S-3.5-4	1/23/2019	<5.0	**5.3**	**110**	**0.3**	**0.37**	**66**	**5.2**	**31**	**180**	**0.086**	<1.0	**31**	<1.7	<0.89	<5.0	**28**	**130**
DG-AM15	9.5-10	DG-AM15S-9.5-10	1/23/2019	<5.0	**6.3**	**87**	**0.43**	**0.27**	**49**	**9.4**	**33**	**29**	**0.033**	<0.99	**33**	<1.7	<0.88	<5.0	**48**	**63**
DG-AM15 (D)	9.5-10	DG-AM15 (D)S-9.5-10	1/23/2019	<4.9	**7.8**	**88**	**0.62**	<0.25	**48**	**8.1**	**37**	**21**	**0.039**	<0.99	**32**	<1.7	<0.88	<4.9	**53**	**64**
DG-AM2	0.5-1	DG-AM2S-0.5-1	12/17/2018	<0.26	**9.5**	**33**	<0.10	<0.039	**12**	**11**	**130**	**0.82**	**0.097**	<0.20	**4.5**	<0.47	<0.16	<0.45	**110**	**32**
DG-AM2	3.5-4	DG-AM2S-3.5-4	12/17/2018	**0.38**	**11**	**47**	<0.10	**0.3**	**7.7**	**7.9**	**90**	**68**	**0.06**	**0.28**	**4.3**	<0.48	<0.16	<0.46	**68**	**110**
DG-AM3	0.5-1	DG-AM3S-0.5-1	12/19/2018	**1.9**	**13**	**57**	<0.068	**0.59**	**17**	**9.8**	**130**	**140**	**0.098**	**1.1**	**16**	<0.32	<0.11	<0.31	**85**	**190**
DG-AM3	3.5-4	DG-AM3S-3.5-4	12/19/2018	**1.3**	**140**	**88**	**0.16**	**0.36**	**28**	**12**	**75**	**51**	**0.1**	**0.66**	**37**	**0.55**	<0.13	<0.37	**58**	**93**
DG-AM4	0.5-1	DG-AM4S-0.5-1	12/18/2018	**0.79**	**14**	**47**	<0.11	**0.26**	**15**	**15**	**120**	**47**	**0.098**	**1.2**	**10**	**0.75**	<0.17	<0.50	**120**	**110**
DG-AM4	3.5-4	DG-AM4S-3.5-4	12/18/2018	**0.67**	**160**	**130**	**0.44**	**0.39**	**100**	**23**	**50**	**140**	**0.18**	**0.48**	**72**	**0.42**	<0.14	<0.40	**67**	**220**
DG-AM5	0.5-1	DG-AM5S-0.5-1	12/17/2018	**3.3**	**6.4**	**68**	<0.11	**1.7**	**39**	**13**	**240**	**790**	**0.18**	**2.7**	**23**	**0.58**	**0.9**	<0.49	**86**	**1300**
DG-AM5	3.5-4	DG-AM5S-3.5-4	12/17/2018	**0.36**	**5.9**	**30**	<0.11	<0.041	**10**	**12**	**150**	**8.9**	**0.033**	<0.21	**4.4**	<0.49	<0.17	<0.48	**140**	**52**
DG-AM6	0.5-1	DG-AM6S-0.5-1	12/20/2018	**1.4**	<0.24	**7.4**	**2**	**0.13**	**16**	**21**	**110**	**1.5**	**0.084**	**0.73**	**8.1**	**0.63**	<0.14	<0.41	**160**	**63**
DG-AM6	3.5-4	DG-AM6S-3.5-4	12/20/2018	**4**	**68**	**83**	**0.59**	**1.2**	**28**	**11**	**170**	**270**	**0.14**	**1.6**	**43**	**0.8**	<0.15	<0.44	**59**	**230**
DG-AM7	0.5-1	DG-AM7S-0.5-1	1/9/2019	**13**	**15**	**280**	**0.18**	**8**	**58**	**15**	**490**	**930**	**0.9**	**9.3**	**89**	**3.4**	**0.79**	<0.50	**35**	**1400**
DG-AM7	3.5-4	DG-AM7S-3.5-4	1/9/2019	**1.2**	**4.9**	**96**	**0.19**	**0.58**	**15**	**5.4**	**43**	**120**	**0.046**	**0.53**	**14**	**0.69**	**0.18**	<0.45	**32**	**130**
DG-AM7	7.5-8	DG-AM7S-7.5-8	1/9/2019	**14**	**43**	**420**	**0.67**	**0.82**	**60**	**13**	**470**	**28000**	**0.23**	**3.2**	**48**	**3.3**	**3.7**	<1.1	**24**	**990**
DG-AM8	0.5-1	DG-AM8S-0.5-1	1/30/2019	**5.7**	**20**	**73**	**0.2**	**4.4**	**35**	**7.2**	**270**	**270**	**0.54**	**1.5**	**44**	**1.6**	**0.6**	**0.78**	**35**	**550**
DG-AM8 (D)	0.5-1	DG-AM8 (D)S-0.5-1	1/30/2019	**0.82**	**3.7**	**84**	**0.19**	**0.17**	**19**	**6**	**35**	**47**	**0.035**	<0.15	**18**	<0.36	**0.15**	<0.35	**26**	**100**
DG-AM8	3.5-4	DG-AM8S-3.5-4	1/30/2019	**75**	**35**	**1100**	**0.37**	**15**	**75**	**8.4**	**1600**	**8700**	**0.039**	**0.57**	**55**	<1.9	**4.5**	<1.8	**29**	**17000**
DG-AM9	0.5-1	DG-AM9S-0.5-1	1/30/2019	**8.1**	**16**	**220**	<0.083	**3.9**	**71**	**14**	**490**	**680**	**0.3**	**6**	**130**	**3.8**	**0.42**	**0.82**	**38**	**1300**
DG-AM9	3.5-4	DG-AM9S-3.5-4	1/30/2019	**34**	**24**	**1300**	<1.0	**3.1**	**58**	**14**	**630**	**4300**	**2.5**	**0.79**	**49**	<4.7	**5.4**	<4.6	**37**	**2400**
DG-AN10	0.5-1	DG-AN10S-0.5-1	1/15/2019	**1.8**	**8.6**	**87**	<0.11	**2.3**	**23**	**13**	**200**	**240**	**0.17**	**1.4**	**18**	**1**	**0.18**	<0.48	**95**	**600**
DG-AN10	3.5-4	DG-AN10S-3.5-4	1/15/2019	**34**	**18**	**1100**	**0.32**	**3.7**	**52**	**6.2**	**570**	**5100**	**1.9**	**2.7**	**44**	**1.4**	**6.3**	**0.55**	**24**	**2400**

Table 2: Metals Concentrations in Soil
UPC OU-2
Brisbane, California

Sample Location	Depth Range (ft bgs)	Sample Name	Collection Date	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
Direct Exposure Human Health Risk Level Residential Soil Exposure ESL [1]				1.1E+01	6.7E-02	1.5E+04	1.6E+01	7.8E+01	1.2E+05	2.3E+01	3.1E+03	8.0E+01	1.3E+01	3.9E+02	8.2E+02	3.9E+02	3.9E+02	7.8E-01	3.9E+02	2.3E+04
Regional Background [2]				5.5E+00	1.9E+01	3.2E+02	1.0E+00	2.7E+00	1.0E+02	2.5E+01	6.9E+01	1.6E+01	4.0E-01	7.4E+00	1.2E+02	5.6E+00	1.8E+00	7.6E+00	7.4E+01	1.1E+02
Units				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
DG-AN11	0.5-1	DG-AN11S-0.5-1	1/28/2019	**1.1**	<0.34	**8.9**	<0.13	**0.15**	**8.7**	**15**	**99**	**2.5**	**0.06**	**0.32**	**5.2**	<0.59	<0.20	<0.57	**97**	**49**
DG-AN11	3.5-4	DG-AN11S-3.5-4	1/28/2019	**1.6**	**0.58**	**42**	<0.13	**0.069**	**8.1**	**11**	**93**	**7.9**	**0.11**	<0.25	**4**	<0.59	<0.20	<0.57	**97**	**43**
DG-AN12	0.5-1	DG-AN12S-0.5-1	1/25/2019	**0.64**	**9.5**	**22**	**0.1**	**0.24**	**11**	**2.4**	**18**	**59**	**0.036**	<0.15	**10**	<0.34	<0.12	<0.33	**13**	**50**
DG-AN12	3.5-4	DG-AN12S-3.5-4	1/25/2019	**2.5**	**140**	**120**	<0.099	**0.54**	**64**	**14**	**110**	**34**	**0.1**	<0.20	**13**	**2.2**	<0.15	**1.7**	**100**	**360**
DG-AN13	0.5-1	DG-AN13S-0.5-1	1/31/2019	**0.92**	**6**	**47**	**0.6**	**0.19**	**37**	**11**	**38**	**11**	**0.013**	<0.24	**54**	**2.3**	<0.19	<0.55	**59**	**45**
DG-AN13	3.5-4	DG-AN13S-3.5-4	1/31/2019	**1.1**	**0.39**	**250**	**0.77**	**0.28**	**41**	**21**	**81**	**5.4**	**0.14**	<0.21	**35**	**1.7**	**0.29**	<0.47	**120**	**69**
DG-AN13	9.5-10	DG-AN13S-9.5-10	1/31/2019	**18**	**28**	**500**	<0.63	**3.7**	**58**	**6**	**1200**	**9200**	**12**	**3.7**	**34**	<2.9	**4.7**	<2.8	**19**	**2900**
DG-AN14	0.5-1	DG-AN14S-0.5-1	1/21/2019	**0.94**	**1.7**	**140**	<0.12	**0.14**	**29**	**5.3**	**24**	**49**	**0.034**	**0.41**	**24**	<0.55	<0.18	<0.53	**29**	**86**
DG-AN2	0.5-1	DG-AN2S-0.5-1	12/17/2018	**0.34**	**0.8**	**24**	<0.10	<0.040	**8.8**	**13**	**140**	**6.6**	**0.034**	<0.21	**3.8**	<0.48	**0.18**	<0.47	**130**	**48**
DG-AN2 (D)	0.5-1	DG-AN2 (D)S-0.5-1	12/17/2018	<0.26	<0.27	**28**	<0.10	<0.039	**7.5**	**12**	**130**	**6.5**	**0.044**	<0.20	**3.8**	<0.48	<0.16	<0.46	**110**	**52**
DG-AN2	3.5-4	DG-AN2S-3.5-4	12/17/2018	**0.65**	**30**	**35**	<0.080	**0.18**	**7**	**9.1**	**88**	**23**	**0.047**	<0.16	**3.7**	<0.37	<0.12	<0.36	**72**	**55**
DG-AN3	0.5-1	DG-AN3S-0.5-1	12/14/2018	**2.9**	**23**	**45**	<0.097	**0.61**	**16**	**11**	**190**	**240**	**0.14**	**1.2**	**12**	**0.93**	<0.15	<0.43	**96**	**180**
DG-AN3	3.5-4	DG-AN3S-3.5-4	12/14/2018	**2.8**	**270**	**79**	**0.13**	**0.4**	**24**	**12**	**94**	**100**	**0.11**	**2.4**	**34**	<0.38	**0.57**	<0.37	**67**	**110**
DG-AN4	0.5-1	DG-AN4S-0.5-1	12/17/2018	**8.8**	**36**	**150**	**0.1**	**5**	**66**	**15**	**2400**	**750**	**0.92**	**6.5**	**73**	<0.43	**0.85**	<0.41	**36**	**710**
DG-AN4	3.5-4	DG-AN4S-3.5-4	12/17/2018	**11**	**160**	**180**	**0.23**	**2.9**	**24**	**8.7**	**220**	**880**	**0.75**	**0.27**	**25**	<0.55	**0.67**	<0.53	**45**	**830**
DG-AN5	0.5-1	DG-AN5S-0.5-1	12/20/2018	<120	**200**	**23000**	**120**	**51**	**4700**	**4400**	**62000**	**4600**	**0.071**	**250**	**1800**	<220	<73	<210	**45000**	**18000**
DG-AN5	3.5-4	DG-AN5S-3.5-4	12/20/2018	<2.0	**83**	**810**	<0.39	<0.30	**6.4**	**10**	**96**	**5.2**	**0.031**	<0.78	**3.8**	<3.6	<1.2	<3.5	**81**	**36**
DG-AN6	0.5-1	DG-AN6S-0.5-1	12/21/2018	**1.2**	**1.3**	**18**	**1.7**	**0.38**	**9.9**	**18**	**110**	**15**	**0.063**	**0.89**	**6.6**	**0.36**	<0.12	<0.33	**140**	**77**
DG-AN6	3.5-4	DG-AN6S-3.5-4	12/21/2018	**12**	**71**	**200**	**0.87**	**3.5**	**55**	**14**	**270**	**740**	**0.35**	**5.2**	**52**	**2.9**	**0.64**	<0.44	**66**	**590**
DG-AN7	0.5-1	DG-AN7S-0.5-1	12/19/2018	**10**	**15**	**230**	<0.10	**7.2**	**86**	**12**	**500**	**870**	**0.97**	**8.4**	**96**	**1.2**	**0.98**	<0.47	**28**	**1300**
DG-AN7	3.5-4	DG-AN7S-3.5-4	12/19/2018	**0.64**	**3.3**	**66**	<0.11	**0.07**	**12**	**4.9**	**17**	**19**	**0.03**	<0.21	**15**	**0.69**	<0.17	<0.48	**28**	**55**
DG-AN8	3.5-4	DG-AN8S-3.5-4	1/15/2019	**0.46**	**4.6**	**61**	**0.33**	**0.21**	**20**	**6.3**	**18**	**7.9**	**0.016**	**0.6**	**13**	**1.1**	<0.20	<0.56	**54**	**40**
DG-AN9	0.5-1	DG-AN9S-0.5-1	1/21/2019	**2.3**	**6.4**	**99**	<0.090	**1.3**	**82**	**21**	**94**	**150**	**0.52**	**0.96**	**130**	<0.41	<0.14	<0.40	**34**	**210**
DG-AN9	3.5-4	DG-AN9S-3.5-4	1/21/2019	**21**	**33**	**1400**	**0.21**	**0.79**	**33**	**14**	**380**	**980**	**0.11**	**0.6**	**84**	<1.4	<0.48	<1.4	**31**	**200**
DG-AN9	7-7.5	DG-AN9S-7-7.5	1/21/2019	**2.3**	**7.6**	**38**	**0.45**	**0.41**	**35**	**22**	**42**	**27**	**0.034**	<0.16	**47**	**0.71**	<0.13	<0.37	**45**	**110**
DG-AO10	0.5-1	DG-AO10S-0.5-1	1/15/2019	**2.9**	**4.7**	**170**	<0.090	**1.6**	**28**	**11**	**180**	**320**	**0.19**	**1.1**	**12**	**1.7**	**0.24**	<0.40	**81**	**630**
DG-AO10	3.5-4	DG-AO10S-3.5-4	1/15/2019	**45**	**40**	**1200**	<0.30	**4.2**	**59**	**11**	**1400**	**4300**	**1.1**	**4.5**	**65**	**12**	**4.2**	**1.5**	**23**	**3300**
DG-AO11	0.5-1	DG-AO11S-0.5-1	1/22/2019	**0.64**	**18**	**62**	**0.19**	**0.33**	**36**	**10**	**60**	**71**	**0.12**	**0.32**	**63**	<0.35	<0.12	**0.6**	**51**	**97**
DG-AO11	3.5-4	DG-AO11S-3.5-4	1/22/2019	**24**	**150**	**350**	**0.52**	**0.35**	**28**	**18**	**310**	**1700**	**0.12**	**0.98**	**49**	<1.1	**0.86**	<1.1	**30**	**430**
DG-AO12	0.5-1	DG-AO12S-0.5-1	1/31/2019	**45**	**36**	**1400**	**0.49**	**5.7**	**88**	**11**	**1400**	**4800**	**0.65**	**1.6**	**73**	**5.8**	**8**	<0.56	**42**	**3500**
DG-AO12	3.5-4	DG-AO12S-3.5-4	1/31/2019	**57**	**54**	**1900**	**0.24**	**6**	**59**	**13**	**640**	**6000**	**0.02**	**1.7**	**47**	<2.7	**5.1**	<2.6	**41**	**2700**
DG-AO14	0.5-1	DG-AO14S-0.5-1	1/21/2019	**1.2**	**7.2**	**87**	**0.69**	**0.19**	**29**	**11**	**34**	**40**	**0.035**	**0.21**	**27**	<0.49	<0.17	<0.48	**38**	**62**
DG-AO2	0.5-1	DG-AO2S-0.5-1	12/17/2018	**1**	**4.1**	**71**	<0.11	<0.042	**10**	**13**	**140**	**74**	**0.069**	<0.22	**6.3**	<0.50	<0.17	<0.49	**110**	**88**
DG-AO2	3.5-4	DG-AO2S-3.5-4	12/17/2018	**2.9**	**350**	**100**	<0.077	**0.9**	**20**	**10**	**210**	**390**	**0.23**	**0.35**	**26**	**0.61**	**0.72**	<0.35	**67**	**270**
DG-AO3	0.5-1	DG-AO3S-0.5-1	12/19/2018	**0.76**	**3.9**	**39**	<0.086	**0.33**	**14**	**7.5**	**140**	**64**	**0.1**	**0.7**	**14**	<0.40	<0.13	<0.38	**81**	**110**
DG-AO3	3.5-4	DG-AO3S-3.5-4	12/19/2018	**2.7**	**230**	**190**	**0.51**	**0.27**	**31**	**16**	**72**	**43**	**0.07**	**1.5**	**48**	**1.8**	<0.15	<0.43	**37**	**110**
DG-AO4	0.5-1	DG-AO4S-0.5-1	12/17/2018	**0.69**	**0.69**	**30**	<0.074	**0.059**	**8.2**	**14**	**81**	**6.1**	**0.057**	<0.15	**4.1**	<0.34	<0.11	<0.33	**97**	**77**
DG-AO4	3.5-4	DG-AO4S-3.5-4	12/17/2018	**1.2**	**140**	**100**	**0.19**	**1.4**	**35**	**8.4**	**51**	**120**	**0.25**	<0.13	**24**	<0.31	**0.37**	<0.30	**43**	**400**
DG-AO4 (D)	3.5-4	DG-AO4 (D)S-3.5-4	12/17/2018	**1**	**230**	**77**	**0.19**	**1.1**	**45**	**7.7**	**12**	**24**	**0.55**	**0.17**	**23**	<0.35	<0.12	<0.34	**38**	**72**
DG-AO5	0.5-1	DG-AO5S-0.5-1	12/17/2018	**2.1**	**2**	**120**	<0.081	**0.4**	**11**	**11**	**170**	**270**	**0.15**	**0.45**	**8**	<0.38	**0.45**	<0.36	**95**	**1100**
DG-AO5	3.5-4	DG-AO5S-3.5-4	12/17/2018	<0.27	**24**	**67**	<0.10	<0.040	**7.7**	**9.4**	**160**	**5.8**	**0.094**	<0.21	**3.6**	<0.48	<0.16	<0.47	**89**	**39**
DG-AO6	0.5-1	DG-AO6S-0.5-1	12/21/2018	**5.7**	**13**	**94**	**1.5**	**4.8**	**56**	**19**	**290**	**560**	**0.64**	**7.2**	**47**	**2.3**	<0.19	<0.54	**120**	**530**
DG-AO6	3.5-4	DG-AO6S-3.5-4	12/21/2018	**7.7**	**35**	**190**	**0.74**	**2.4**	**35**	**9.9**	**230**	**670**	**0.3**	**2.7**	**38**	**1.4**	<0.12	<0.35	**51**	**390**
DG-AO7	0.5-1	DG-AO7S-0.5-1	1/9/2019	**39**	**16**	**350**	**0.19**	**3.4**	**40**	**8.9**	**350**	**410**	**0.42**	**3.1**	**67**	**1.5**	**0.49**	<0.46	**36**	**530**
DG-AO7	3.5-4	DG-AO7S-3.5-4	1/9/2019	**1.9**	**3.5**	**61**	**0.11**	**0.099**	**13**	**5.6**	**15**	**350**	**0.033**	**0.34**	**17**	**0.4**	<0.13	<0.36	**30**	**39**
DG-AO8	0.5-1	DG-AO8S-0.5-1	1/30/2019	**1.3**	**14**	**100**	**0.16**	**2.5**	**15**	**4.7**	**1800**	**72**	**0.05**	**0.26**	**15**	<0.48	**0.2**	<0.47	**25**	**240**
DG-AO8	3.5-4	DG-AO8S-3.5-4	1/30/2019	**9.7**	**24**	**320**	**0.13**	**5.4**	**38**	**12**	**1800**	**1400**	**0.71**	**0.87**	**75**	<0.99	**1.3**	<0.95	**20**	**1500**
DG-AO8 (D)	3.5-4	DG-AO8 (D)S-3.5-4	1/30/2019	**25**	**33**	**780**	**0.34**	**6.9**	**46**	**8.9**	**820**	**7200**	**2.8**	**1.3**	**66**	**3.7**	**2.9**	<0.91	**24**	**3300**
DG-AO9	0.5-1	DG-AO9S-0.5-1	1/30/2019	**5.4**	**6.2**	**120**	<0.098	**1.8**	**150**	**13**	**210**	**220**	**0.94**	**1.4**	**84**	**2.2**	<0.15	**0.74**	**44**	**460**
DG-AO9	3.5-4	DG-AO9S-3.5-4	1/30/2019	**5**	**26**	**190**	<0.070	**0.8**	**22**	**18**	**280**	**240**	**0.069**	**0.59**	**75**	**2.4**	**0.28**	**0.57**	**39**	**620**
DG-AP10	0.5-1	DG-AP10S-0.5-1	1/28/2019	**0.81**	**0.26**	**22**	<0.093	**0.2**	**10**	**13**	**78**	**13**	**0.067**	**1.1**	**4.8**	**1.1**	<0.14	**0.81**	**90**	**71**
DG-AP10	3.5-4	DG-AP10S-3.5-4	1/28/2019	**8.1**	**17**	**410**	**0.17**	**1.5**	**52**	**9**	**580**	**1200**	**0.13**	<0.19	**95**	**3.1**	**2**	<0.44	**34**	**720**

Table 2: Metals Concentrations in Soil
UPC OU-2
Brisbane, California

Sample Location	Depth Range (ft bgs)	Sample Name	Collection Date	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
Direct Exposure Human Health Risk Level Residential Soil Exposure ESL [1]				1.1E+01	6.7E-02	1.5E+04	1.6E+01	7.8E+01	1.2E+05	2.3E+01	3.1E+03	8.0E+01	1.3E+01	3.9E+02	8.2E+02	3.9E+02	3.9E+02	7.8E-01	3.9E+02	2.3E+04
Regional Background [2]				5.5E+00	1.9E+01	3.2E+02	1.0E+00	2.7E+00	1.0E+02	2.5E+01	6.9E+01	1.6E+01	4.0E-01	7.4E+00	1.2E+02	5.6E+00	1.8E+00	7.6E+00	7.4E+01	1.1E+02
Units				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
DG-AP11	0.5-1	DG-AP11S-0.5-1	1/31/2019	**1.2**	**3.4**	**87**	<0.095	**0.27**	**45**	**10**	**100**	**120**	**0.069**	**0.8**	**66**	**0.82**	**0.3**	**0.63**	**60**	**110**
DG-AP11 (D)	0.5-1	DG-AP11 (D)S-0.5-1	1/31/2019	**1.7**	**4**	**150**	<0.088	**0.8**	**26**	**8.9**	**150**	**240**	**0.15**	**1.2**	**18**	**0.61**	**0.45**	<0.39	**76**	**260**
DG-AP11	3.5-4	DG-AP11S-3.5-4	1/31/2019	**60**	**33**	**1600**	**1**	**7.3**	**43**	**10**	**920**	**7700**	**0.36**	**2.5**	**32**	**7.5**	**7.2**	<1.0	**32**	**2500**
DG-AP12	0.5-1	DG-AP12S-0.5-1	1/31/2019	**45**	**44**	**1100**	**0.54**	**6.7**	**110**	**13**	**1900**	**10000**	**1**	**1.7**	**99**	**8.2**	**11**	<1.3	**37**	**4700**
DG-AP12	3.5-4	DG-AP12S-3.5-4	1/31/2019	**36**	**23**	**1200**	**0.51**	**2.4**	**48**	**9.6**	**1000**	**5100**	**1.3**	**1.1**	**49**	**7.2**	**5.6**	<1.1	**27**	**2500**
DG-AP13	0.5-1	DG-AP13S-0.5-1	1/23/2019	<5.0	**6.3**	**98**	**0.49**	<0.25	**95**	**9.6**	**27**	**24**	**0.12**	<1.0	**23**	<1.7	<0.89	<5.0	**44**	**56**
DG-AP13 (D)	0.5-1	DG-AP13 (D)S-0.5-1	1/23/2019	<5.0	**8.7**	**120**	**0.47**	<0.25	**150**	**11**	**43**	**51**	**0.19**	<0.99	**28**	<1.7	<0.88	<5.0	**51**	**170**
DG-AP13	3.5-4	DG-AP13S-3.5-4	1/23/2019	<5.0	**3.7**	**120**	**0.4**	<0.25	**80**	**12**	**27**	**7.1**	**0.12**	<1.0	**41**	<1.7	<0.89	<5.0	**75**	**40**
DG-AP13	9.5-10	DG-AP13S-9.5-10	1/23/2019	**15**	**27**	**170**	<0.50	**1.9**	**25**	**20**	**1100**	**4100**	**0.086**	**2.1**	**57**	**3.7**	<1.8	<10	**27**	**1300**
DG-AP14	0.5-1	DG-AP14S-0.5-1	1/22/2019	**1.2**	**11**	**96**	**0.49**	**0.16**	**50**	**9.8**	**27**	**42**	**0.061**	**0.2**	**33**	**0.83**	**0.23**	<0.34	**51**	**62**
DG-AP14	3.5-4	DG-AP14S-3.5-4	1/22/2019	**2.2**	**16**	**73**	**0.32**	**0.13**	**42**	**5.5**	**69**	**12**	**0.098**	**0.27**	**24**	**0.63**	<0.18	<0.52	**59**	**34**
DG-AP2	0.5-1	DG-AP2S-0.5-1	12/17/2018	<0.18	**1.2**	**33**	<0.071	<0.027	**8.4**	**7.3**	**100**	**8.5**	**0.2**	**0.25**	**3.2**	<0.33	**0.13**	<0.32	**68**	**31**
DG-AP2	3.5-4	DG-AP2S-3.5-4	12/17/2018	**4.9**	**360**	**120**	<0.090	**0.65**	**25**	**18**	**340**	**340**	**0.37**	**0.53**	**28**	**0.94**	**4.2**	<0.40	**73**	**280**
DG-AP3	0.5-1	DG-AP3S-0.5-1	12/14/2018	<0.22	**0.41**	**38**	<0.084	<0.032	**5.5**	**9.4**	**95**	**9.6**	**0.054**	<0.17	**3.2**	<0.39	**0.37**	<0.38	**82**	**39**
DG-AP3	3.5-4	DG-AP3S-3.5-4	12/14/2018	**0.92**	**180**	**31**	<0.071	**0.18**	**6.5**	**7.6**	**110**	**520**	**0.067**	<0.14	**6.7**	<0.33	**2.7**	<0.32	**67**	**130**
DG-AP4	0.5-1	DG-AP4S-0.5-1	12/17/2018	**0.57**	**0.69**	**29**	<0.083	**0.055**	**6.9**	**12**	**78**	**4.8**	**0.036**	<0.16	**2.8**	<0.38	<0.13	<0.37	**83**	**38**
DG-AP4	3.5-4	DG-AP4S-3.5-4	12/17/2018	**2**	**190**	**100**	**0.17**	**0.89**	**39**	**8.9**	**85**	**320**	**0.37**	<0.16	**23**	<0.38	**0.22**	<0.37	**43**	**840**
DG-AP5	0.5-1	DG-AP5S-0.5-1	12/20/2018	**13**	**2.7**	**68**	**0.25**	**0.53**	**13**	**12**	**130**	**62**	**0.14**	**1.3**	**10**	<0.48	<0.16	<0.46	**97**	**120**
DG-AP5	3.5-4	DG-AP5S-3.5-4	12/20/2018	**0.82**	**19**	**59**	**0.23**	**0.2**	**26**	**4.4**	**23**	**64**	**0.013**	<0.17	**21**	<0.39	<0.13	<0.37	**21**	**62**
DG-AP6	0.5-1	DG-AP6S-0.5-1	12/21/2018	**8.5**	**22**	**170**	**0.71**	**5.8**	**73**	**12**	**420**	**530**	**0.8**	**8.3**	**68**	**2**	**0.82**	<0.33	**50**	**920**
DG-AP6	3.5-4	DG-AP6S-3.5-4	12/21/2018	**5.1**	**64**	**460**	**0.42**	**2.1**	**36**	**8.6**	**130**	**460**	**0.12**	**1.4**	**33**	**0.99**	**1**	<0.50	**35**	**670**
DG-AP7	0.5-1	DG-AP7S-0.5-1	12/19/2018	**14**	**34**	**440**	<0.094	**9.9**	**73**	**21**	**450**	**810**	**1.9**	**15**	**88**	**2.8**	**0.46**	<1.0	**30**	**1400**
DG-AP7	3.5-4	DG-AP7S-3.5-4	12/19/2018	**1.3**	**5.2**	**61**	**0.24**	**0.12**	**15**	**5.3**	**15**	**7.2**	**0.019**	<0.18	**16**	<0.42	<0.14	<0.41	**32**	**35**
DG-AP7 (D)	3.5-4	DG-AP7 (D)S-3.5-4	12/19/2018	**1.3**	**5.2**	**60**	**0.19**	**0.19**	**18**	**4.9**	**19**	**13**	**0.022**	<0.17	**16**	<0.40	<0.13	<0.39	**29**	**49**
DG-AP8	0.5-1	DG-AP8S-0.5-1	12/21/2018	**1.4**	**6.6**	**93**	**0.19**	**0.25**	**11**	**4.9**	**33**	**60**	**0.07**	<0.23	**10**	<0.54	<0.18	<0.52	**25**	**120**
DG-AP8	3.5-4	DG-AP8S-3.5-4	12/21/2018	**19**	**21**	**1100**	**0.16**	**3**	**54**	**11**	**530**	**2400**	**0.8**	**0.91**	**40**	<1.2	**4**	**1.6**	**20**	**2200**
DG-AP9	0.5-1	DG-AP9S-0.5-1	1/21/2019	**1.1**	**1.2**	**41**	<0.11	**2.2**	**9.7**	**9.4**	**110**	**33**	**0.048**	<0.21	**5.4**	**0.52**	<0.17	<0.48	**88**	**60**
DG-AP9	3.5-4	DG-AP9S-3.5-4	1/21/2019	**41**	**41**	**1100**	**0.2**	**4.3**	**80**	**15**	**840**	**6100**	**0.18**	**1.5**	**70**	<2.3	**5.9**	<2.2	**27**	**3000**
DG-AQ10	0.5-1	DG-AQ10S-0.5-1	2/1/2019	**1.4**	**2.3**	**55**	<0.11	**1.2**	**33**	**16**	**140**	**140**	**0.13**	**0.58**	**13**	<0.52	**0.28**	**0.63**	**110**	**260**
DG-AQ10	3.5-4	DG-AQ10S-3.5-4	2/1/2019	**22**	**14**	**760**	**0.13**	**4.1**	**40**	**11**	**7700**	**2700**	**1.1**	**0.75**	**46**	**5.8**	**6.2**	<0.78	**40**	**2700**
DG-AQ11	0.5-1	DG-AQ11S-0.5-1	1/30/2019	**1.5**	**2.2**	**92**	**0.37**	**0.13**	**16**	**9.6**	**150**	**230**	**0.17**	<0.17	**7.8**	<0.40	<0.13	<0.38	**82**	**190**
DG-AQ11	3.5-4	DG-AQ11S-3.5-4	1/30/2019	**41**	**21**	**1400**	**0.65**	**2.4**	**88**	**25**	**740**	**3900**	**0.49**	**2.2**	**150**	**5.6**	**8**	<1.4	**25**	**2700**
DG-AQ12	0.5-1	DG-AQ12S-0.5-1	1/21/2019	**1.3**	**2.3**	**350**	**0.63**	**0.28**	**44**	**19**	**75**	**6.7**	**0.54**	**0.99**	**46**	**0.89**	**0.26**	<0.32	**100**	**75**
DG-AQ12	3.5-4	DG-AQ12S-3.5-4	1/21/2019	**1.7**	**8.3**	**130**	**0.48**	**0.13**	**56**	**19**	**45**	**21**	**0.052**	**0.23**	**34**	<0.43	<0.15	<0.42	**56**	**47**
DG-AQ13	0.5-1	DG-AQ13S-0.5-1	1/21/2019	**1.3**	**4.1**	**520**	**0.75**	**0.37**	**43**	**29**	**91**	**9.6**	**0.49**	**1.8**	**63**	**1.6**	**0.64**	<0.42	**110**	**89**
DG-AQ13	3.5-4	DG-AQ13S-3.5-4	1/21/2019	**0.99**	**4.2**	**96**	**0.34**	**0.1**	**42**	**9.8**	**20**	**12**	**0.85**	<0.22	**29**	<0.52	<0.18	<0.50	**45**	**43**
DG-AQ13	11.5-12	DG-AQ13S-11.5-12	1/21/2019	**59**	**24**	**1500**	**0.56**	**6.1**	**81**	**24**	**1400**	**9200**	**1.8**	**0.27**	**82**	**3.1**	**7**	<1.9	**36**	**4900**
DG-AQ2	0.5-1	DG-AQ2S-0.5-1	12/17/2018	**0.44**	**7.6**	**25**	**0.1**	**0.11**	**10**	**10**	**93**	**20**	**0.077**	<0.18	**4.8**	<0.42	<0.14	<0.40	**72**	**42**
DG-AQ2	3.5-4	DG-AQ2S-3.5-4	12/17/2018	**4.2**	**210**	**270**	**0.44**	**0.82**	**27**	**9.2**	**250**	**600**	**0.31**	**0.26**	**28**	<0.56	**0.24**	<0.54	**32**	**630**
DG-AQ2 (D)	3.5-4	DG-AQ2 (D)S-3.5-4	12/17/2018	**3.2**	**150**	**220**	**0.25**	**0.44**	**21**	**5.7**	**120**	**400**	**0.33**	<0.21	**20**	<0.50	<0.17	<0.48	**22**	**470**
DG-AQ2	7.5-8	DG-AQ2S-7.5-8	12/17/2018	**1.8**	**38**	**94**	**0.12**	<0.031	**76**	**14**	**27**	**10**	**2.1**	<0.16	**110**	<0.37	<0.13	<0.36	**52**	**49**
DG-AQ3	0.5-1	DG-AQ3S-0.5-1	12/19/2018	<0.22	**0.6**	**23**	**0.29**	**0.038**	**5.1**	**7**	**150**	**2.7**	**0.045**	**0.33**	**3.6**	**1.2**	<0.14	<0.39	**62**	**22**
DG-AQ3	3.5-4	DG-AQ3S-3.5-4	12/19/2018	**0.88**	**52**	**130**	**0.089**	**0.25**	**23**	**12**	**39**	**45**	**0.062**	**0.58**	**37**	**0.68**	<0.13	<0.36	**25**	**82**
DG-AQ4	0.5-1	DG-AQ4S-0.5-1	12/17/2018	**0.27**	**5.1**	**34**	<0.10	<0.039	**11**	**11**	**120**	**6.7**	**0.05**	<0.20	**3.6**	<0.47	<0.16	<0.46	**84**	**40**
DG-AQ4	3.5-4	DG-AQ4S-3.5-4	12/17/2018	**3.5**	**190**	**140**	**0.12**	**1.4**	**24**	**7.7**	**110**	**420**	**0.24**	<0.16	**15**	<0.37	**0.42**	<0.36	**45**	**770**
DG-AQ4	9-9.5	DG-AQ4S-9-9.5	12/17/2018	**1.4**	**6**	**59**	**0.31**	<0.044	**29**	**8.7**	**6.5**	**0.95**	**0.014**	**0.52**	**21**	<0.54	<0.18	<0.52	**39**	**29**
DG-AQ5	0.5-1	DG-AQ5S-0.5-1	12/17/2018	**0.41**	**0.29**	**22**	<0.10	<0.039	**12**	**14**	**110**	**1.2**	**0.073**	**0.79**	**5.2**	<0.47	**0.19**	<0.46	**110**	**45**
DG-AQ5 (D)	0.5-1	DG-AQ5 (D)S-0.5-1	12/17/2018	**0.47**	**0.74**	**20**	<0.098	<0.037	**9.8**	**14**	**100**	**1.7**	**0.074**	**0.8**	**4.4**	<0.45	**0.27**	<0.44	**110**	**45**
DG-AQ5	3.5-4	DG-AQ5S-3.5-4	12/17/2018	**1.4**	**13**	**49**	<0.10	<0.038	**8.5**	**15**	**120**	**46**	**0.022**	<0.20	**5.6**	<0.46	<0.16	<0.45	**110**	**67**
DG-AQ6	0.5-1	DG-AQ6S-0.5-1	12/21/2018	**2.8**	**9.1**	**210**	**0.66**	**1.6**	**37**	**8.6**	**150**	**320**	**0.38**	**1.9**	**39**	<0.54	<0.18	<0.52	**49**	**280**
DG-AQ6	3.5-4	DG-AQ6S-3.5-4	12/21/2018	**1.5**	**14**	**66**	**0.42**	**0.17**	**17**	**5.4**	**17**	**25**	**0.042**	**0.33**	**20**	<0.45	<0.15	<0.44	**33**	**40**
DG-AQ6	11-11.5	DG-AQ6S-11-11.5	12/21/2018	**2.9**	**19**	**63**	**1**	**0.65**	**27**	**12**	**32**	**65**	**0.059**	**0.74**	**29**	<0.44	<0.15	<0.43	**35**	**170**

Table 2: Metals Concentrations in Soil
UPC OU-2
Brisbane, California

Sample Location	Depth Range (ft bgs)	Sample Name	Collection Date	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
Direct Exposure Human Health Risk Level Residential Soil Exposure ESL [1]				1.1E+01	6.7E-02	1.5E+04	1.6E+01	7.8E+01	1.2E+05	2.3E+01	3.1E+03	8.0E+01	1.3E+01	3.9E+02	8.2E+02	3.9E+02	3.9E+02	7.8E-01	3.9E+02	2.3E+04
Regional Background [2]				5.5E+00	1.9E+01	3.2E+02	1.0E+00	2.7E+00	1.0E+02	2.5E+01	6.9E+01	1.6E+01	4.0E-01	7.4E+00	1.2E+02	5.6E+00	1.8E+00	7.6E+00	7.4E+01	1.1E+02
Units				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
DG-AQ7	0.5-1	DG-AQ7S-0.5-1	1/30/2019	<0.23	4.5	49	0.26	0.057	13	4.6	19	14	0.018	<0.18	13	<0.41	<0.14	<0.40	30	30
DG-AQ7	3.5-4	DG-AQ7S-3.5-4	1/30/2019	9.4	21	320	0.46	0.91	51	10	1300	1400	2	0.47	85	<0.50	1.4	<0.48	44	660
DG-AQ8	0.5-1	DG-AQ8S-0.5-1	12/21/2018	11	16	280	0.13	8.6	96	15	450	870	0.95	11	110	<0.54	1	<0.52	40	1300
DG-AQ8	3.5-4	DG-AQ8S-3.5-4	12/21/2018	44	35	1200	0.3	6	49	13	1000	4500	0.9	1.5	61	<0.90	8.4	1.8	29	2400
DG-AQ8	8-8.5	DG-AQ8S-8-8.5	12/21/2018	2.3	16	130	0.62	<0.044	36	11	75	290	0.091	0.85	36	<0.54	0.31	<0.52	45	200
DG-AQ9	0.5-1	DG-AQ9S-0.5-1	1/30/2019	3.4	7.2	72	<0.13	0.68	32	10	140	200	0.17	1.4	24	0.8	<0.20	1.3	110	410
DG-AQ9	3.5-4	DG-AQ9S-3.5-4	1/30/2019	<0.20	<0.20	28	<0.077	0.14	9.3	11	130	1.4	0.043	<0.15	5.3	<0.36	<0.12	1.6	120	36
DG-AR10	0.5-1	DG-AR10S-0.5-1	1/31/2019	66	43	1900	0.56	7.8	88	15	1900	9800	3	2.1	78	3.1	8.5	3	33	4700
DG-AR10	3.5-4	DG-AR10S-3.5-4	1/31/2019	65	24	2100	0.89	6.3	53	10	1800	6900	1.6	1.2	67	2.4	7.4	2	34	4900
DG-AR11	0.5-1	DG-AR11S-0.5-1	1/30/2019	19	24	1000	0.33	2.8	160	13	770	1600	1.2	0.94	58	2.6	2.7	0.73	47	1700
DG-AR11	3.5-4	DG-AR11S-3.5-4	1/30/2019	200	15	1500	<0.30	7.7	2600	15	1500	4000	2.8	1.5	88	6.4	5.8	<1.3	41	4400
DG-AR12	0.5-1	DG-AR12S-0.5-1	1/21/2019	0.89	6.1	110	0.6	0.14	63	11	26	23	0.088	0.19	26	0.65	0.19	<0.31	51	50
DG-AR12	3.5-4	DG-AR12S-3.5-4	1/21/2019	40	20	920	0.2	26	2000	11	1600	5200	22	0.94	58	8.1	9.8	<1.2	36	3800
DG-AR13	0.5-1	DG-AR13S-0.5-1	1/23/2019	<5.0	6.1	120	1.4	0.37	170	11	62	64	0.36	<1.0	33	<1.7	<0.89	<5.0	54	180
DG-AR13	3.5-4	DG-AR13S-3.5-4	1/23/2019	36	27	710	1.2	2.9	100	10	1600	1900	2.7	3.7	53	<1.7	3.8	<5.0	50	1800
DG-AR13	9.5-10	DG-AR13S-9.5-10	1/23/2019	17	20	930	0.52	7.1	42	11	790	3000	1.6	2.2	39	1.8	4	<5.0	22	2000
DG-AR2	0.5-1	DG-AR2S-0.5-1	12/17/2018	<0.33	5.2	80	<0.13	0.29	12	12	190	94	0.087	<0.26	7	<0.60	0.33	<0.58	110	120
DG-AR2	3.5-4	DG-AR2S-3.5-4	12/17/2018	1.2	180	88	0.23	0.54	17	8.1	150	170	0.43	0.21	16	<0.34	0.46	<0.33	50	130
DG-AR3	0.5-1	DG-AR3S-0.5-1	12/14/2018	0.29	7.4	49	<0.089	<0.034	13	12	170	23	0.077	<0.18	6	<0.41	0.49	<0.40	110	57
DG-AR3	3.5-4	DG-AR3S-3.5-4	12/14/2018	1.2	41	27	<0.067	0.13	12	9.6	130	36	0.073	0.56	6.4	<0.31	0.39	<0.30	76	53
DG-AR4	0.5-1	DG-AR4S-0.5-1	12/17/2018	<0.17	0.7	37	<0.066	<0.025	5.4	8.9	120	2.2	0.035	<0.13	2.3	<0.30	<0.10	<0.29	71	33
DG-AR4	3.5-4	DG-AR4S-3.5-4	12/17/2018	1.7	120	91	0.21	1	44	9.9	50	140	0.57	<0.16	32	<0.38	0.57	<0.36	39	310
DG-AR5	0.5-1	DG-AR5S-0.5-1	12/20/2018	<0.27	<0.27	39	<0.10	<0.040	9.9	11	160	7.6	0.067	<0.21	4.4	<0.48	<0.16	<0.47	90	39
DG-AR5	3.5-4	DG-AR5S-3.5-4	12/20/2018	0.69	18	180	0.48	0.33	89	16	39	70	0.088	0.49	140	<0.43	<0.15	<0.42	45	75
DG-AR6	0.5-1	DG-AR6S-0.5-1	12/21/2018	4.4	11	260	0.44	3	47	8.6	220	570	0.26	5	48	0.44	0.33	<0.40	31	530
DG-AR6	3.5-4	DG-AR6S-3.5-4	12/21/2018	1.7	13	34	0.13	0.23	26	3.5	26	75	0.015	0.29	29	<0.55	<0.19	<0.53	12	44
DG-AR7	0.5-1	DG-AR7S-0.5-1	12/19/2018	5.4	16	150	0.21	3.4	74	11	260	2700	0.7	16	77	1.7	3	<0.43	35	580
DG-AR7	3.5-4	DG-AR7S-3.5-4	12/19/2018	0.77	2.4	45	0.19	0.056	12	4.5	9.8	8.9	0.022	<0.20	17	<0.47	<0.16	<0.45	19	26
DG-AR8	0.5-1	DG-AR8S-0.5-1	12/21/2018	3.6	9.5	220	0.12	3.1	49	9.9	240	450	0.31	3.4	56	0.82	0.66	<0.31	38	1600
DG-AR8	3.5-4	DG-AR8S-3.5-4	12/21/2018	23	31	430	0.22	0.58	19	7.3	180	1600	0.078	1.6	25	0.51	1.3	0.34	34	540
DG-AR9	0.5-1	DG-AR9S-0.5-1	1/9/2019	6.9	14	200	0.22	2.8	53	13	270	450	0.46	5.1	51	2	0.69	<0.40	66	670
DG-AR9	3.5-4	DG-AR9S-3.5-4	1/9/2019	3.5	27	230	0.19	0.54	30	3.7	180	1200	0.073	0.55	26	1	1.5	<0.34	14	390
DG-AR9 (D)	3.5-4	DG-AR9 (D)S-3.5-4	1/9/2019	5.3	49	330	0.23	0.6	39	4.7	180	800	0.066	0.7	39	<0.34	1.5	<0.33	17	530
DG-AS10	0.5-1	DG-AS10S-0.5-1	1/31/2019	76	35	1500	0.46	4.3	99	14	19000	6900	1.2	2.1	74	10	8	<1.4	46	3400
DG-AS10	3.5-4	DG-AS10S-3.5-4	1/31/2019	23	22	920	0.33	3.8	89	12	680	2700	0.98	1.3	77	4.8	3.4	<0.52	39	3000
DG-AS11	0.5-1	DG-AS11S-0.5-1	1/31/2019	19	20	550	0.32	3.3	59	7.2	430	3200	1.5	0.68	34	3.9	4	<0.34	22	1400
DG-AS11	3.5-4	DG-AS11S-3.5-4	1/31/2019	39	30	1700	0.49	11	360	13	2400	7100	1.4	1	73	<1.2	8.6	<1.2	43	4100
DG-AS11	7.5-8	DG-AS11S-7.5-8	1/31/2019	63	34	1300	0.97	8.8	43	13	1300	7300	0.26	1.6	55	2.8	6.3	<1.1	35	3100
DG-AS12	0.5-1	DG-AS12S-0.5-1	1/21/2019	5.3	6.6	210	0.49	0.87	200	10	170	470	0.69	0.24	36	1.2	1.1	<0.43	46	590
DG-AS12	3.5-4	DG-AS12S-3.5-4	1/21/2019	5.3	8	140	0.46	0.65	240	12	100	360	1.8	<0.22	35	0.69	0.54	<0.50	38	410
DG-AS2	0.5-1	DG-AS2S-0.5-1	12/17/2018	<0.27	9.2	43	<0.10	<0.040	7	9.9	130	14	0.042	<0.20	3.4	<0.48	<0.16	<0.46	110	42
DG-AS2	3.5-4	DG-AS2S-3.5-4	12/17/2018	0.39	2.2	20	<0.072	<0.028	6.2	9.3	84	2.2	0.068	0.17	3.4	<0.33	<0.11	<0.32	66	32
DG-AS3	0.5-1	DG-AS3S-0.5-1	12/20/2018	0.49	0.91	57	0.14	0.087	9.1	7.6	110	36	0.081	<0.19	5.2	<0.43	<0.15	<0.42	73	70
DG-AS3 (D)	0.5-1	DG-AS3 (D)S-0.5-1	12/20/2018	1.2	2.1	47	0.11	0.31	14	9.2	110	59	0.11	0.19	11	0.7	<0.13	<0.37	72	91
DG-AS3	3.5-4	DG-AS3S-3.5-4	12/20/2018	5.9	190	69	0.23	1.1	21	8.4	130	120	0.2	0.19	23	<0.31	0.27	<0.30	47	130
DG-AS3	4.5-5	DG-AS3S-4.5-5	12/20/2018	2.2	21	58	0.89	<0.047	39	11	37	10	0.088	<0.24	35	<0.57	<0.19	<0.55	47	74
DG-AS4	0.5-1	DG-AS4S-0.5-1	12/17/2018	0.27	0.64	36	<0.074	<0.028	4.3	8.8	76	2.3	0.043	<0.15	2.1	<0.34	<0.12	<0.33	68	35
DG-AS4 (D)	0.5-1	DG-AS4 (D)S-0.5-1	12/17/2018	<0.19	0.43	25	<0.075	<0.029	4	5	72	2.5	0.051	<0.15	2.2	<0.34	<0.12	<0.33	46	34
DG-AS4	3.5-4	DG-AS4S-3.5-4	12/17/2018	2.8	230	150	0.23	0.87	43	11	110	330	0.56	0.28	31	<0.46	0.45	<0.44	45	460
DG-AS5	0.5-1	DG-AS5S-0.5-1	12/17/2018	0.72	2.2	29	<0.12	0.098	10	8.7	86	7.2	0.067	0.36	7.2	<0.56	<0.19	<0.54	76	30
DG-AS5	3.5-4	DG-AS5S-3.5-4	12/17/2018	<0.20	1.9	120	<0.077	0.066	30	3.4	10	48	0.075	<0.15	36	<0.36	0.17	0.51	17	41
DG-AS6	0.5-1	DG-AS6S-0.5-1	12/21/2018	5.3	17	150	0.45	1.9	47	9.6	160	360	0.45	3.2	56	0.87	<0.14	<0.41	36	330

Table 2: Metals Concentrations in Soil
UPC OU-2
Brisbane, California

Sample Location	Depth Range (ft bgs)	Sample Name	Collection Date	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
Direct Exposure Human Health Risk Level Residential Soil Exposure ESL [1]				1.1E+01	6.7E-02	1.5E+04	1.6E+01	7.8E+01	1.2E+05	2.3E+01	3.1E+03	8.0E+01	1.3E+01	3.9E+02	8.2E+02	3.9E+02	3.9E+02	7.8E-01	3.9E+02	2.3E+04
Regional Background [2]				5.5E+00	1.9E+01	3.2E+02	1.0E+00	2.7E+00	1.0E+02	2.5E+01	6.9E+01	1.6E+01	4.0E-01	7.4E+00	1.2E+02	5.6E+00	1.8E+00	7.6E+00	7.4E+01	1.1E+02
Units				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
DG-AS6	3.5-4	DG-AS6S-3.5-4	12/21/2018	**0.79**	**17**	**89**	**0.12**	**0.19**	**8**	**4.4**	**16**	**35**	**0.023**	**0.23**	**7.6**	<0.45	<0.15	<0.44	**23**	**60**
DG-AS7	0.5-1	DG-AS7S-0.5-1	1/9/2019	**9.6**	**15**	**170**	**0.19**	**3.8**	**77**	**15**	**310**	**940**	**0.88**	**7.1**	**150**	**3.6**	**0.52**	<0.56	**73**	**970**
DG-AS7	3.5-4	DG-AS7S-3.5-4	1/9/2019	**0.75**	**3.5**	**75**	**0.25**	**0.035**	**12**	**6.2**	**15**	**7.6**	**0.036**	**0.36**	**13**	<0.30	<0.10	<0.29	**40**	**31**
DG-AS8	0.5-1	DG-AS8S-0.5-1	12/21/2018	**6.8**	**130**	**190**	**0.42**	**0.5**	**43**	**12**	**230**	**450**	**0.97**	**0.89**	**71**	<0.53	**0.73**	<0.51	**51**	**340**
DG-AS8 (D)	0.5-1	DG-AS8 (D)S-0.5-1	12/21/2018	**10**	**200**	**290**	**0.25**	**1.1**	**47**	**14**	**300**	**610**	**1.4**	**1.3**	**87**	**0.43**	**0.7**	<0.36	**58**	**510**
DG-AS8	3.5-4	DG-AS8S-3.5-4	12/21/2018	**1.1**	**110**	**77**	**0.41**	<0.042	**52**	**14**	**13**	**17**	**0.043**	<0.22	**41**	<0.51	<0.17	<0.50	**52**	**40**
DG-AS9	0.5-1	DG-AS9S-0.5-1	12/20/2018	<0.27	**4.5**	**22**	**0.13**	**0.071**	**83**	**5.2**	**17**	**14**	**0.0022**	**0.34**	**80**	<0.49	<0.17	<0.48	**7.6**	**12**
DG-AS9	3.5-4	DG-AS9S-3.5-4	12/20/2018	**1.2**	**6.3**	**110**	**0.26**	**0.99**	**26**	**11**	**180**	**130**	**0.18**	**1.3**	**21**	**0.46**	**0.19**	<0.44	**82**	**290**
DG-AT10	0.5-1	DG-AT10S-0.5-1	1/30/2019	**15**	**140**	**380**	**0.26**	**2.2**	**55**	**19**	**400**	**1400**	**0.83**	**1.3**	**64**	<1.1	**1**	**1.2**	**55**	**720**
DG-AT10	3.5-4	DG-AT10S-3.5-4	1/30/2019	**82**	**31**	**2100**	<0.30	**7.9**	**230**	**15**	**3000**	**12000**	**2.9**	**1**	**100**	**5.9**	**9**	**3.9**	**46**	**4900**
DG-AT11	3.5-4	DG-AT11S-3.5-4	1/21/2019	**7**	**8.7**	**230**	**0.16**	**1.6**	**33**	**5.8**	**240**	**210**	**0.24**	**0.79**	**58**	<1.1	**0.4**	<1.1	**3.9**	**970**
DG-AT12	0.5-1	DG-AT12S-0.5-1	1/23/2019	**51**	**25**	**530**	<0.50	**6.1**	**1400**	**4.5**	**630**	**11000**	**0.26**	<2.0	**52**	<3.4	<1.8	<10	**12**	**3800**
DG-AT12	3.5-4	DG-AT12S-3.5-4	1/23/2019	<5.0	**10**	**150**	**0.43**	**0.29**	**110**	**7.5**	**79**	**120**	**0.014**	<1.0	**34**	<1.7	<0.89	<5.0	**56**	**190**
DG-AT12	9.5-10	DG-AT12S-9.5-10	1/23/2019	**51**	**29**	**1600**	<1.2	**4.8**	**53**	<2.5	**1100**	**6600**	<0.012	<5.0	**74**	<8.4	**5.6**	<25	**25**	**2900**
DG-AT2	0.5-1	DG-AT2S-0.5-1	12/17/2018	**0.59**	**1.9**	**29**	<0.12	<0.045	**9**	**10**	**130**	**15**	**0.16**	<0.23	**3.8**	<0.54	<0.18	<0.52	**110**	**46**
DG-AT2 (D)	0.5-1	DG-AT2 (D)S-0.5-1	12/17/2018	<0.30	<0.31	**25**	<0.12	<0.046	**8.1**	**9.4**	**100**	**6.4**	**0.12**	<0.23	**3.2**	<0.55	<0.19	<0.53	**100**	**36**
DG-AT2	3.5-4	DG-AT2S-3.5-4	12/17/2018	**0.55**	**1.2**	**26**	<0.094	<0.036	**8**	**12**	**100**	**7.7**	**0.12**	**0.29**	**3.9**	**0.69**	<0.15	<0.42	**89**	**42**
DG-AT3	0.5-1	DG-AT3S-0.5-1	12/14/2018	**0.39**	**3.3**	**37**	<0.11	<0.041	**11**	**9.4**	**120**	**18**	**0.12**	**0.48**	**5.8**	<0.49	**0.49**	<0.48	**94**	**49**
DG-AT3	3.5-4	DG-AT3S-3.5-4	12/14/2018	**2.9**	**440**	**63**	<0.11	**0.75**	**18**	**10**	**140**	**130**	**0.14**	<0.22	**14**	**0.52**	**0.66**	<0.50	**73**	**180**
DG-AT4	0.5-1	DG-AT4S-0.5-1	12/17/2018	<0.26	**0.76**	**50**	<0.10	**0.11**	**5.6**	**13**	**110**	**9**	**0.042**	<0.20	**3.4**	**0.61**	<0.16	<0.46	**87**	**350**
DG-AT4	3.5-4	DG-AT4S-3.5-4	12/17/2018	**1.2**	**150**	**180**	**0.18**	**0.87**	**30**	**6.7**	**71**	**310**	**0.68**	**0.3**	**24**	<0.39	**0.38**	<0.38	**34**	**370**
DG-AT5	0.5-1	DG-AT5S-0.5-1	12/20/2018	**0.68**	**0.21**	**28**	<0.078	<0.030	**10**	**12**	**200**	**2**	**0.029**	<0.15	**4.5**	<0.36	<0.12	<0.35	**95**	**36**
DG-AT5	3.5-4	DG-AT5S-3.5-4	12/20/2018	**8.3**	**83**	**180**	**0.25**	**0.86**	**20**	**8.8**	**140**	**600**	**0.16**	**0.49**	**19**	<0.37	**0.98**	<0.35	**53**	**350**
DG-AT6	0.5-1	DG-AT6S-0.5-1	12/21/2018	**8.1**	**12**	**190**	<0.18	**4.6**	**86**	**15**	**530**	**860**	**0.6**	**9.7**	**78**	<0.82	**0.6**	<0.79	**50**	**900**
DG-AT6	3.5-4	DG-AT6S-3.5-4	12/21/2018	**0.89**	**6**	**73**	**0.57**	**0.16**	**13**	**6.8**	**16**	**12**	**0.017**	**0.49**	**16**	<0.41	<0.14	<0.40	**51**	**38**
DG-AT7	3.5-4	DG-AT7S-3.5-4	12/19/2018	**1.1**	**86**	**70**	**0.17**	**0.07**	**15**	**9.6**	**66**	**21**	**0.052**	<0.19	**17**	<0.44	<0.15	<0.43	**59**	**54**
DG-AT8	0.5-1	DG-AT8S-0.5-1	12/21/2018	**1**	**4.3**	**83**	**0.37**	<0.047	**18**	**10**	**130**	**39**	**0.12**	**0.89**	**24**	<0.57	<0.19	<0.55	**100**	**120**
DG-AT8	3.5-4	DG-AT8S-3.5-4	12/21/2018	**18**	**38**	**1200**	**0.43**	**3.6**	**56**	**8.5**	**720**	**4400**	**0.66**	**0.61**	**47**	<0.58	**5.9**	**0.64**	**25**	**2500**
DG-AT9	0.5-1	DG-AT9S-0.5-1	1/30/2019	**29**	**9**	**380**	**0.12**	**1.7**	**26**	**9.5**	**380**	**1100**	**0.49**	**0.44**	**22**	<0.38	**1.8**	<0.36	**49**	**800**
DG-AT9	3.5-4	DG-AT9S-3.5-4	1/30/2019	**210**	**41**	**1600**	**0.42**	**8**	**69**	**24**	**1200**	**5300**	**0.34**	**1**	**89**	**9.2**	**8.3**	<1.8	**40**	**4900**
DG-AU10	0.5-1	DG-AU10S-0.5-1	1/30/2019	**46**	**29**	**970**	**0.46**	**4.8**	**69**	**14**	**1000**	**4800**	**0.9**	**1.1**	**110**	**2**	**5.7**	**1.1**	**39**	**3000**
DG-AU10	3.5-4	DG-AU10S-3.5-4	1/30/2019	**61**	**100**	**1700**	**0.36**	**4.3**	**130**	**40**	**2300**	**6900**	**0.54**	**2.4**	**290**	**8**	**5.5**	**2.6**	**23**	**5100**
DG-AU10 (D)	3.5-4	DG-AU10 (D)S-3.5-4	1/30/2019	**67**	**47**	**1200**	<1.3	**4.8**	**160**	**41**	**2700**	**8500**	**0.34**	**1.2**	**310**	**12**	**7.2**	**9.5**	**31**	**4700**
DG-AU11	0.5-1	DG-AU11S-0.5-1	1/23/2019	<5.0	**5.5**	**84**	**0.5**	<0.25	**54**	**9.6**	**22**	**12**	**0.16**	<1.0	**32**	<1.7	<0.89	<5.0	**50**	**49**
DG-AU11	3.5-4	DG-AU11S-3.5-4	1/23/2019	<5.0	**4.7**	**97**	**0.43**	<0.25	**49**	**9.7**	**24**	**11**	**0.15**	<1.0	**29**	<1.7	<0.89	<5.0	**49**	**46**
DG-AU11	9.5-10	DG-AU11S-9.5-10	1/23/2019	**58**	**40**	**990**	<0.50	**4.1**	**1200**	**6.4**	**2900**	**8400**	**11**	**3.8**	**56**	**4.7**	**31**	<10	**15**	**2900**
DG-AU2	0.5-1	DG-AU2S-0.5-1	12/17/2018	**0.51**	<0.30	**27**	<0.12	<0.044	**8.2**	**15**	**120**	**3**	**0.046**	<0.23	**3.6**	**0.65**	<0.18	<0.52	**130**	**47**
DG-AU2	3.5-4	DG-AU2S-3.5-4	12/17/2018	**1.2**	**1**	**46**	<0.074	**0.046**	**12**	**14**	**130**	**2.5**	**0.059**	**0.41**	**5**	<0.34	**0.22**	<0.33	**120**	**48**
DG-AU3	0.5-1	DG-AU3S-0.5-1	12/20/2018	**0.99**	**9.4**	**64**	**0.11**	**0.28**	**15**	**10**	**120**	**66**	**0.11**	**0.2**	**10**	<0.41	**0.18**	<0.40	**92**	**96**
DG-AU3	3.5-4	DG-AU3S-3.5-4	12/20/2018	**0.79**	**79**	**290**	**0.48**	**0.15**	**19**	**6.4**	**43**	**61**	**0.42**	**0.26**	**22**	<0.33	**0.11**	<0.32	**28**	**180**
DG-AU4	0.5-1	DG-AU4S-0.5-1	12/17/2018	**0.92**	<0.31	**40**	<0.12	<0.046	**4.4**	**11**	**82**	**0.39**	**0.029**	<0.24	**2.5**	<0.56	<0.19	<0.54	**91**	**39**
DG-AU4	3.5-4	DG-AU4S-3.5-4	12/17/2018	**0.95**	**46**	**150**	**0.2**	**0.13**	**49**	**9.3**	**13**	**260**	**0.15**	**0.35**	**28**	<0.30	**0.16**	<0.29	**39**	**76**
DG-AU5	0.5-1	DG-AU5S-0.5-1	12/17/2018	<0.31	<0.32	**250**	**0.29**	**7**	**4100**	**36**	**830**	**950**	**1.3**	**80**	**2900**	**2.3**	**1.1**	**2.7**	**47**	**1300**
DG-AU5	3.5-4	DG-AU5S-3.5-4	12/17/2018	**4.2**	**120**	**31**	<0.068	**0.31**	**9.3**	**3.2**	**52**	**160**	**0.069**	**0.35**	**11**	<0.32	<0.11	<0.31	**18**	**57**
DG-AU6	0.5-1	DG-AU6S-0.5-1	12/21/2018	**6.8**	**15**	**200**	<0.18	**5.4**	**84**	**13**	**510**	**600**	**0.57**	**9.3**	**80**	<0.85	**0.81**	<0.82	**32**	**750**
DG-AU6	3.5-4	DG-AU6S-3.5-4	12/21/2018	**9.7**	**110**	**79**	**0.74**	**0.5**	**18**	**8.8**	**140**	**320**	**0.55**	**1.3**	**27**	**1.1**	<0.11	<0.32	**57**	**110**
DG-AU7	0.5-1	DG-AU7S-0.5-1	1/9/2019	**2.3**	**6.2**	**110**	**0.14**	**1.5**	**24**	**10**	**130**	**220**	**0.14**	**1.6**	**24**	**1.3**	**0.17**	<0.47	**63**	**300**
DG-AU7 (D)	0.5-1	DG-AU7 (D)S-0.5-1	1/9/2019	**5**	**8.5**	**120**	**0.17**	**1.7**	**28**	**9.9**	**180**	**310**	**0.19**	**2.6**	**44**	**2.3**	<0.19	<0.54	**61**	**340**
DG-AU7	3.5-4	DG-AU7S-3.5-4	1/9/2019	**91**	**43**	**1200**	<2.9	**6.2**	**46**	**13**	**1500**	**6700**	**0.74**	**6.3**	**110**	**18**	**6.5**	<13	**26**	**3700**
DG-AU8	0.5-1	DG-AU8S-0.5-1	12/21/2018	**79**	**48**	**2000**	**1.2**	**10**	**100**	**16**	**1700**	**7900**	**1.9**	**5.9**	**99**	**7.3**	**17**	<1.4	**53**	**5200**
DG-AU8	3.5-4	DG-AU8S-3.5-4	12/21/2018	**35**	**24**	**1700**	**0.95**	**5.8**	**58**	**13**	**3000**	**4900**	**1**	**4**	**63**	**2.6**	**6.6**	<1.3	**32**	**3400**
DG-AU9	0.5-1	DG-AU9S-0.5-1	1/30/2019	**20**	**19**	**190**	**0.17**	**20**	**43**	**6.6**	**3700**	**3500**	**2**	**1.6**	**57**	**1.9**	**3.8**	**0.74**	**22**	**4200**

Table 2: Metals Concentrations in Soil
UPC OU-2
Brisbane, California

Sample Location	Depth Range (ft bgs)	Sample Name	Collection Date	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
Direct Exposure Human Health Risk Level Residential Soil Exposure ESL [1]				1.1E+01	6.7E-02	1.5E+04	1.6E+01	7.8E+01	1.2E+05	2.3E+01	3.1E+03	8.0E+01	1.3E+01	3.9E+02	8.2E+02	3.9E+02	3.9E+02	7.8E-01	3.9E+02	2.3E+04
Regional Background [2]				5.5E+00	1.9E+01	3.2E+02	1.0E+00	2.7E+00	1.0E+02	2.5E+01	6.9E+01	1.6E+01	4.0E-01	7.4E+00	1.2E+02	5.6E+00	1.8E+00	7.6E+00	7.4E+01	1.1E+02
Units				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
DG-AU9	3.5-4	DG-AU9S-3.5-4	1/30/2019	**140**	**37**	**360**	**0.51**	**7.8**	**110**	**14**	**2100**	**9200**	**2.6**	**1.9**	**130**	**7.9**	**34**	<2.2	**40**	**7000**
DG-AV10	0.5-1	DG-AV10S-0.5-1	1/21/2019	**2.6**	**9**	**150**	**0.46**	**0.98**	**250**	**11**	**110**	**140**	**0.38**	**0.32**	**52**	**1.4**	<0.12	<0.35	**47**	**400**
DG-AV10	3.5-4	DG-AV10S-3.5-4	1/21/2019	**0.96**	**6.1**	**55**	**0.48**	**0.47**	**37**	**12**	**52**	**41**	**0.23**	<0.15	**33**	**0.71**	<0.12	<0.34	**34**	**190**
DG-AV10	14.5-15	DG-AV10S-14.5-15	1/21/2019	**48**	**20**	**1600**	**0.81**	**66**	**970**	**13**	**5100**	**7200**	**13**	**1.9**	**3400**	**2.4**	**11**	<0.85	**31**	**7300**
DG-AV12	0.5-1	DG-AV12S-0.5-1	1/22/2019	**5.2**	**21**	**310**	**0.81**	**1.1**	**730**	**19**	**180**	**230**	**0.6**	**3.5**	**55**	**1.7**	<0.37	<1.1	**55**	**750**
DG-AV12	3.5-4	DG-AV12S-3.5-4	1/22/2019	**0.81**	**9.9**	**100**	**0.4**	**0.095**	**70**	**8.7**	**48**	**6.3**	**0.082**	<0.18	**48**	**0.54**	**0.17**	<0.41	**74**	**48**
DG-AV12	19.5-20	DG-AV12S-19.5-20	1/22/2019	**1.2**	**9.3**	**150**	**0.46**	**0.21**	**51**	**22**	**35**	**6.7**	**0.035**	**0.19**	**48**	**1.2**	**0.22**	<0.35	**67**	**87**
DG-AV2	0.5-1	DG-AV2S-0.5-1	2/1/2019	**2.4**	**16**	**56**	**0.23**	**0.93**	**18**	**11**	**150**	**180**	**0.14**	**0.71**	**19**	**1.2**	**0.34**	<0.46	**89**	**230**
DG-AV2	3.5-4	DG-AV2S-3.5-4	2/1/2019	**1.9**	**8.2**	**320**	**0.73**	**0.25**	**49**	**14**	**58**	**360**	**0.071**	<0.20	**56**	**0.85**	<0.15	<0.44	**48**	**100**
DG-AV3	0.5-1	DG-AV3S-0.5-1	2/1/2019	**4.2**	**690**	**130**	<0.096	**0.69**	**12**	**10**	**300**	**230**	**0.13**	<0.19	**12**	**0.54**	**0.45**	<0.43	**77**	**150**
DG-AV3	3.5-4	DG-AV3S-3.5-4	2/1/2019	**0.36**	**7.1**	**27**	<0.090	**0.2**	**9.6**	**8.9**	**110**	**41**	**0.13**	<0.18	**7.6**	<0.42	**0.17**	<0.40	**63**	**59**
DG-AV4	0.5-1	DG-AV4S-0.5-1	12/17/2018	**0.73**	<0.33	**16**	<0.13	<0.048	**16**	**16**	**130**	**1.5**	**0.031**	<0.25	**6.1**	<0.58	<0.20	<0.56	**120**	**48**
DG-AV4	3.5-4	DG-AV4S-3.5-4	12/17/2018	**1.2**	**9.9**	**160**	**0.5**	**0.061**	**31**	**17**	**39**	**23**	**0.077**	**0.28**	**46**	<0.54	**0.18**	<0.52	**29**	**79**
DG-AV4 (D)	3.5-4	DG-AV4 (D)S-3.5-4	12/17/2018	**0.94**	**16**	**140**	**0.55**	<0.026	**25**	**12**	**43**	**17**	**0.048**	**0.37**	**40**	<0.31	<0.11	<0.30	**25**	**81**
DG-AV4	8-8.5	DG-AV4S-8-8.5	12/17/2018	**1.5**	**13**	**39**	**0.44**	**0.081**	**26**	**13**	**20**	**7.1**	**0.034**	**0.59**	**27**	<0.51	<0.17	<0.50	**35**	**54**
DG-AV5	0.5-1	DG-AV5S-0.5-1	12/20/2018	**5**	**12**	**240**	**0.45**	**1.6**	**51**	**9.4**	**300**	**290**	**1.3**	**3.5**	**48**	**0.7**	**7.7**	<0.49	**38**	**550**
DG-AV5 (D)	0.5-1	DG-AV5 (D)S-0.5-1	12/20/2018	**5.8**	**15**	**190**	**0.15**	**3**	**100**	**13**	**480**	**420**	**1**	**12**	**93**	**0.84**	**1.2**	<0.35	**36**	**720**
DG-AV5	3.5-4	DG-AV5S-3.5-4	12/20/2018	**13**	**1400**	**33**	**0.33**	**0.77**	**24**	**3.3**	**8.3**	**28**	**0.023**	<0.21	**19**	**0.52**	<0.17	**32**	**15**	**40**
DG-AV5	7.5-8	DG-AV5S-7.5-8	12/20/2018	**2.3**	**110**	**55**	**1**	<0.035	**38**	**19**	**45**	**13**	**0.039**	**0.24**	**36**	<0.42	<0.14	<0.41	**48**	**82**
DG-AV6	0.5-1	DG-AV6S-0.5-1	12/21/2018	**5.9**	**12**	**300**	**0.39**	**2.3**	**47**	**16**	**190**	**290**	**0.36**	**4.3**	**55**	**1.1**	**0.3**	<0.45	**40**	**360**
DG-AV6	3.5-4	DG-AV6S-3.5-4	12/21/2018	**51**	**32**	**1600**	**0.94**	**6.3**	**56**	**13**	**1200**	**5400**	**1**	**4.2**	**50**	**3.4**	**9.1**	<0.86	**27**	**4200**
DG-AV6 (D)	3.5-4	DG-AV6 (D)S-3.5-4	12/21/2018	**190**	**34**	**1800**	**1**	**6**	**71**	**11**	**1300**	**10000**	**1**	**3.1**	**60**	**3.9**	**7.6**	<1.0	**46**	**3900**
DG-AV6	7-7.5	DG-AV6S-7-7.5	12/21/2018	**3.2**	**23**	**100**	**1.1**	**0.67**	**38**	**16**	**89**	**120**	**0.046**	**1.2**	**44**	**0.58**	<0.17	<0.48	**53**	**310**
DG-AV7	0.5-1	DG-AV7S-0.5-1	12/20/2018	<0.28	**140**	**81**	**0.34**	**0.12**	**11**	**15**	**160**	**10**	**0.16**	**0.51**	**5.2**	**1.1**	<0.17	<0.48	**130**	**58**
DG-AV7	3.5-4	DG-AV7S-3.5-4	12/20/2018	**72**	**73**	**1900**	**0.69**	**19**	**85**	**12**	**9900**	**6000**	**2.1**	**4.7**	**150**	**10**	**11**	**18**	**42**	**10000**
DG-AV7	7.5-8	DG-AV7S-7.5-8	12/20/2018	**94**	**36**	**1300**	**0.64**	**5.6**	**52**	**12**	**12000**	**4300**	**0.72**	**5.1**	**120**	<1.3	**9.7**	**2.8**	**28**	**6100**
DG-AV8	0.5-1	DG-AV8S-0.5-1	12/21/2018	**38**	**29**	**1500**	**1.3**	**17**	**71**	**15**	**1400**	**3400**	**1**	**3.8**	**71**	**4.2**	**5.6**	<1.1	**45**	**6500**
DG-AV8 (D)	0.5-1	DG-AV8 (D)S-0.5-1	12/21/2018	**25**	**26**	**1400**	**0.65**	**5.4**	**64**	**11**	**1100**	**3400**	**0.94**	**4.3**	**60**	<1.3	**5.6**	<1.2	**39**	**2900**
DG-AV8	3.5-4	DG-AV8S-3.5-4	12/21/2018	**50**	**19**	**990**	**0.87**	**5.7**	**47**	**7.4**	**1600**	**5800**	**1.3**	**3.3**	**40**	**3.9**	**6.8**	<1.4	**28**	**5500**
DG-AV9	0.5-1	DG-AV9S-0.5-1	2/1/2019	**35**	**61**	**1200**	**0.32**	**8.8**	**85**	**19**	**900**	**3000**	**1**	**7.6**	**83**	**3.7**	**3.6**	<1.3	**28**	**3400**
DG-AV9	3.5-4	DG-AV9S-3.5-4	2/1/2019	**68**	**26**	**190**	**0.46**	**3.6**	**50**	**15**	**1300**	**4700**	**1.4**	**2.5**	**48**	**6.4**	**6**	<1.1	**29**	**2800**
DG-AV9	8.5-9	DG-AV9S-8.5-9	2/1/2019	**26**	**21**	**970**	**0.45**	**5.8**	**37**	**8.4**	**1500**	**4100**	**1.2**	**0.96**	**46**	**2.2**	**5.2**	**1.4**	**20**	**3100**
DG-AW10	0.5-1	DG-AW10S-0.5-1	1/21/2019	**0.46**	**6.8**	**59**	**0.8**	**0.46**	**67**	**15**	**27**	**18**	**0.068**	<0.22	**61**	**1.1**	<0.17	<0.49	**61**	**77**
DG-AW10	3.5-4	DG-AW10S-3.5-4	1/21/2019	<0.26	**2.4**	**27**	<0.10	**0.13**	**38**	**3.7**	**17**	**9.6**	**0.023**	<0.20	**19**	**0.77**	<0.16	<0.46	**22**	**33**
DG-AW11	0.5-1	DG-AW11S-0.5-1	1/23/2019	<5.0	**8.3**	**73**	**0.69**	<0.25	**170**	**12**	**44**	**41**	**0.16**	<1.0	**30**	<1.7	<0.89	<5.0	**46**	**120**
DG-AW11	3.5-4	DG-AW11S-3.5-4	1/23/2019	<5.0	**4.9**	**150**	**0.38**	<0.25	**780**	**6.1**	**49**	**59**	**0.22**	<1.0	**24**	<1.7	<0.89	<5.0	**35**	**200**
DG-AW11	7.5-8	DG-AW11S-7.5-8	1/23/2019	<50	<15	**130**	<2.5	<2.5	**8700**	<5.0	**85**	**69**	**2.6**	<10	**13**	<17	<8.9	<50	**22**	**1200**
DG-AW2	0.5-1	DG-AW2S-0.5-1	1/31/2019	**0.28**	**28**	**33**	<0.088	**0.3**	**13**	**9.7**	**110**	**83**	**0.1**	**0.21**	**10**	<0.41	**0.31**	**0.85**	**87**	**86**
DG-AW2	3.5-4	DG-AW2S-3.5-4	1/31/2019	**3.1**	**370**	**140**	**0.19**	**0.36**	**44**	**12**	**97**	**450**	**0.13**	**0.39**	**38**	**1.2**	**0.32**	**0.84**	**64**	**330**
DG-AW2 (D)	3.5-4	DG-AW2 (D)S-3.5-4	1/31/2019	**7.2**	**440**	**130**	<0.11	**1.6**	**35**	**18**	**450**	**820**	**0.073**	**0.36**	**40**	**2.1**	**1**	**1.3**	**98**	**630**
DG-AW3	0.5-1	DG-AW3S-0.5-1	12/14/2018	**27**	**34**	**1400**	**0.56**	**3.7**	**44**	**10**	**790**	**4800**	**0.89**	**0.71**	**62**	<1.3	**8.1**		**32**	**2800**
DG-AW3	0.5-1	DG-AW3S-0.5-1	1/31/2019	**3.4**	**55**	**120**	**0.12**	**1.2**	**38**	**13**	**160**	**230**	**0.23**	**3.2**	**35**	**1.8**	<0.17	<0.49	**74**	**330**
DG-AW3	3.5-4	DG-AW3S-3.5-4	12/14/2018	**2.6**	**7.4**	**150**	<0.10	**1.2**	**29**	**7.1**	**140**	**270**	**0.37**	**1.6**	**37**	<0.47	**0.78**	<0.38	**35**	**310**
DG-AW3	3.5-4	DG-AW3S-3.5-4	1/31/2019	**2.6**	**120**	**130**	**0.15**	**0.6**	**21**	**9.6**	**130**	**150**	**0.19**	**0.29**	**18**	**1.2**	**0.13**	**0.86**	**77**	**260**
DG-AW4	0.5-1	DG-AW4S-0.5-1	2/1/2019	**4**	**51**	**96**	<0.12	**2.6**	**35**	**11**	**200**	**370**	**0.42**	**2.9**	**37**	**1.5**	**0.97**	**0.36**	**60**	**590**
DG-AW4	3.5-4	DG-AW4S-3.5-4	2/1/2019	**0.37**	**62**	**53**	<0.079	**0.41**	**13**	**8.5**	**58**	**16**	**0.099**	<0.16	**16**	<0.36	<0.12	**2**	**56**	**91**
DG-AW6	0.5-1	DG-AW6S-0.5-1	12/21/2018	**2**	**4.7**	**98**	**0.57**	**0.73**	**27**	**7.7**	**77**	**140**	**0.098**	**1.2**	**30**	**0.47**	<0.14	<0.45	**34**	**220**
DG-AW6	3.5-4	DG-AW6S-3.5-4	12/21/2018	**39**	**23**	**1700**	<0.57	**5**	**61**	**10**	**4300**	**5700**	**0.54**	**2.6**	**54**	<2.6	**11**	<0.41	**31**	**3100**
DG-AW6 (D)	3.5-4	DG-AW6 (D)S-3.5-4	12/21/2018	**33**	**22**	**1200**	**0.92**	**4.5**	**50**	**9.4**	**7500**	**4300**	**0.55**	**2.8**	**56**	<1.3	**10**	<2.5	**37**	**3000**
DG-AW7	0.5-1	DG-AW7S-0.5-1	11/21/2018	**35**	**35**	**1500**	**0.53**	**5**	**150**	**15**	**4700**	**4900**	**1.4**	**0.59**	**130**	<1.2	**7.4**	<1.3	**33**	**3600**
DG-AW7	3.5-4	DG-AW7S-3.5-4	11/21/2018	**37**	**22**	**2300**	**1.1**	**8.3**	**75**	**10**	**2000**	**7900**	**0.62**	**1.4**	**66**	<1.5	**13**	**1.6**	**42**	**5400**
DG-AW8	0.5-1	DG-AW8S-0.5-1	1/30/2019	**17**	**24**	**69**	<0.44	**3.3**	**60**	**11**	**670**	**14000**	**0.31**	**5.7**	**65**	**3.8**	**3.4**	<1.5	**30**	**2200**

Table 2: Metals Concentrations in Soil
UPC OU-2
Brisbane, California

Sample Location	Depth Range (ft bgs)	Sample Name	Collection Date	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
Direct Exposure Human Health Risk Level Residential Soil Exposure ESL [1]				1.1E+01	6.7E-02	1.5E+04	1.6E+01	7.8E+01	1.2E+05	2.3E+01	3.1E+03	8.0E+01	1.3E+01	3.9E+02	8.2E+02	3.9E+02	3.9E+02	7.8E-01	3.9E+02	2.3E+04
Regional Background [2]				5.5E+00	1.9E+01	3.2E+02	1.0E+00	2.7E+00	1.0E+02	2.5E+01	6.9E+01	1.6E+01	4.0E-01	7.4E+00	1.2E+02	5.6E+00	1.8E+00	7.6E+00	7.4E+01	1.1E+02
Units				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
DG-AW8	3.5-4	DG-AW8S-3.5-4	1/30/2019	**15**	**14**	**330**	<0.36	**1.1**	**21**	**4.4**	**350**	**1800**	**0.68**	<0.70	**18**	**3.5**	**3.2**	<2.0	**12**	**920**
DG-AW8 (D)	3.5-4	DG-AW8 (D)S-3.5-4	1/30/2019	**13**	**6.5**	**690**	**0.49**	**2.2**	**19**	**3.8**	**420**	**1600**	**0.033**	**1.1**	**24**	**5**	**2.4**	<1.6	**8.2**	**1300**
DG-AW9	0.5-1	DG-AW9S-0.5-1	1/30/2019	**19**	**24**	**1100**	**0.54**	**3.4**	**89**	**13**	**780**	**1900**	**1.7**	<0.47	**64**	**1.9**	**6.3**	**2.3**	**55**	**2100**
DG-AW9 (D)	0.5-1	DG-AW9 (D)S-0.5-1	1/30/2019	**13**	**10**	**340**	**0.24**	**1.5**	**52**	**12**	**270**	**1100**	**0.47**	**0.89**	**36**	**2**	**1.8**	<1.1	**60**	**920**
DG-AW9	3.5-4	DG-AW9S-3.5-4	1/30/2019	**11**	**11**	**130**	**1.1**	**3.5**	**45**	**6.3**	**890**	**3400**	<0.024	**1.2**	**36**	**2.6**	**4**	<0.40	**31**	**2400**
DG-AX10	0.5-1	DG-AX10S-0.5-1	1/21/2019	**0.46**	**5.2**	**110**	**0.49**	**0.4**	**53**	**12**	**32**	**11**	**0.16**	**0.32**	**47**	<0.32	<0.11	<1.2	**59**	**60**
DG-AX10	3.5-4	DG-AX10S-3.5-4	1/21/2019	**0.83**	**10**	**72**	**0.75**	**0.35**	**48**	**7.2**	**58**	**17**	**0.057**	<0.22	**35**	<0.52	<0.17	<0.31	**56**	**64**
DG-AX11	0.5-1	DG-AX11S-0.5-1	1/21/2019	**5.9**	**5.1**	**100**	**0.54**	**0.49**	**440**	**13**	**54**	**88**	**0.41**	<0.19	**35**	**0.93**	<0.15	<0.50	**49**	**230**
DG-AX11	3.5-4	DG-AX11S-3.5-4	1/21/2019	**1.5**	**6.7**	**78**	**0.92**	**0.27**	**30**	**11**	**20**	**13**	**0.042**	**0.31**	**24**	**2.3**	<0.18	<0.42	**41**	**46**
DG-AX2	0.5-1	DG-AX2S-0.5-1	2/1/2019	**4.3**	**67**	**170**	**0.31**	**2.7**	**160**	**14**	**190**	**470**	**0.92**	**4.3**	**120**	**1.2**	**0.39**	<0.52	**62**	**440**
DG-AX2	3.5-4	DG-AX2S-3.5-4	2/1/2019	**4.2**	**96**	**88**	**0.54**	**1.1**	**110**	**18**	**120**	**160**	**0.41**	**0.85**	**150**	<0.57	**0.22**	<0.51	**65**	**200**
DG-AX3	0.5-1	DG-AX3S-0.5-1	2/1/2019	**35**	**350**	**250**	**0.32**	**2.8**	**43**	**12**	**640**	**3100**	**0.18**	<0.22	**59**	**2.1**	**6.1**	<0.55	**43**	**1000**
DG-AX3	3.5-4	DG-AX3S-3.5-4	2/1/2019	**0.97**	**60**	**67**	**0.31**	**0.26**	**97**	**18**	**33**	**10**	**2.2**	<0.22	**140**	**0.73**	<0.18	<0.50	**67**	**56**
DG-AX4	0.5-1	DG-AX4S-0.5-1	2/1/2019	**4.7**	**240**	**110**	<0.12	**0.75**	**28**	**12**	**110**	**160**	**0.16**	**0.39**	**30**	**1.5**	<0.19	<0.51	**62**	**200**
DG-AX4	3.5-4	DG-AX4S-3.5-4	2/1/2019	**4.6**	**420**	**81**	**0.29**	**0.14**	**47**	**14**	**18**	**5.3**	**0.032**	**0.2**	**35**	**0.9**	<0.15	<0.54	**50**	**35**
DG-AX5	0.5-1	DG-AX5S-0.5-1	12/20/2018	**2.4**	**9.6**	**200**	**0.57**	**0.34**	**44**	**12**	**69**	**220**	**0.13**	**0.24**	**42**	**0.56**	<0.17	<0.43	**43**	**230**
DG-AX5	3.5-4	DG-AX5S-3.5-4	12/20/2018	**2.3**	**14**	**64**	**0.9**	<0.038	**39**	**17**	**49**	**12**	**0.096**	<0.20	**38**	<0.47	<0.16	<0.49	**45**	**83**
DG-AX6	0.5-1	DG-AX6S-0.5-1	2/1/2019	**1.3**	**1.6**	**1000**	**0.47**	**0.045**	**1.7**	**0.58**	**48**	**130**	**0.2**	**0.81**	**1.7**	**0.55**	**0.34**	<0.45	**1.6**	**76**
DG-AX6	3.5-4	DG-AX6S-3.5-4	2/1/2019	**0.96**	**7.3**	**79**	**0.99**	**0.21**	**34**	**25**	**37**	**49**	**0.14**	<0.21	**45**	**1.3**	<0.17	<1.9	**52**	**89**
DG-AX7	0.5-1	DG-AX7S-0.5-1	1/30/2019	**26**	**24**	**890**	**1.2**	**3.2**	**81**	**16**	**790**	**1900**	**0.83**	**1.5**	**73**	**3.8**	**4.9**	<0.48	**62**	**2200**
DG-AX7	3.5-4	DG-AX7S-3.5-4	1/30/2019	**31**	**32**	**310**	<0.53	**8**	**55**	**12**	**1400**	**4100**	**1.3**	**1**	**52**	**8.1**	**3.8**	<1.4	**31**	**3700**
DG-AX8	0.5-1	DG-AX8S-0.5-1	1/30/2019	**10**	**40**	**880**	**0.49**	**3.8**	**66**	**9.6**	**430**	**2100**	**0.31**	**2.6**	**44**	<1.9	**1.2**	**2.9**	**36**	**2100**
DG-AX8	3.5-4	DG-AX8S-3.5-4	1/30/2019	**21**	**19**	**3800**	**0.3**	**2.8**	**36**	**4.5**	**250**	**18000**	**3.9**	**0.56**	**21**	**0.71**	**2.7**	<1.8	**16**	**7600**
DG-AX9	0.5-1	DG-AX9S-0.5-1	1/23/2019	<5.0	**7.3**	**120**	**0.61**	<0.25	**71**	**14**	**36**	**28**	**0.42**	<1.0	**80**	<1.7	<0.89	<0.39	**45**	**60**
DG-AX9	3.5-4	DG-AX9S-3.5-4	1/23/2019	<5.0	**3.5**	**76**	<0.25	<0.25	**29**	**7**	**21**	**50**	**0.071**	<1.0	**50**	<1.7	<0.89	<5.0	**36**	**55**
DG-AX9	9.5-10	DG-AX9S-9.5-10	1/23/2019	**16**	**24**	**320**	**0.85**	**2.6**	**87**	**8.1**	**440**	**2200**	**2.6**	**1**	**47**	**2.2**	**1.7**	<5.0	**46**	**1400**
DG-AY2	0.5-1	DG-AY2S-0.5-1	2/1/2019	**5.4**	**330**	**58**	**0.17**	**1.5**	**26**	**13**	**150**	**340**	**0.26**	**0.25**	**48**	**1.7**	**0.26**	<5.0	**48**	**190**
DG-AY2	3.5-4	DG-AY2S-3.5-4	2/1/2019	**0.89**	**11**	**99**	**0.53**	**0.19**	**93**	**17**	**27**	**7.1**	**0.69**	<0.19	**150**	**1.5**	<0.15	<0.52	**66**	**51**
DG-AY3	0.5-1	DG-AY3S-0.5-1	1/31/2019	**0.44**	**8.8**	**37**	**0.11**	**0.24**	**13**	**11**	**120**	**22**	**0.081**	<0.16	**6.5**	<0.38	<0.13	<0.44	**110**	**54**
DG-AY3	3.5-4	DG-AY3S-3.5-4	1/31/2019	**2.6**	**150**	**61**	**0.18**	**0.49**	**23**	**9.7**	**89**	**62**	**0.27**	<0.17	**22**	**1.3**	<0.13	<0.36	**52**	**100**
DG-AY4	0.5-1	DG-AY4S-0.5-1	2/1/2019	**11**	**13**	**130**	<0.096	**3.1**	**47**	**11**	**170**	**1100**	**0.091**	**3.8**	**82**	**2.5**	**0.37**	<0.38	**35**	**520**
DG-AY4 (D)	0.5-1	DG-AY4 (D)S-0.5-1	2/1/2019	**22**	**18**	**190**	<0.080	**3.6**	**56**	**10**	**190**	**1100**	**0.65**	**3.7**	**63**	**2.5**	**0.52**	<0.43	**36**	**710**
DG-AY4	3.5-4	DG-AY4S-3.5-4	2/1/2019	**4.3**	**7.6**	**96**	**0.34**	**0.15**	**56**	**15**	**37**	**22**	**0.45**	<0.24	**71**	**1.5**	<0.19	**0.52**	**53**	**87**
DG-AY8	0.5-1	DG-AY8S-0.5-1	1/30/2019	**0.53**	**4.8**	**100**	**0.51**	**0.11**	**91**	**9**	**23**	**30**	**0.035**	**0.19**	**25**	**0.97**	<0.11	<0.54	**34**	**85**
DG-AY8 (D)	0.5-1	DG-AY8 (D)S-0.5-1	1/30/2019	**0.59**	**6.7**	**120**	**0.73**	**0.099**	**61**	**9.6**	**47**	**39**	**0.062**	<0.13	**30**	<0.31	<0.10	<0.32	**53**	**110**
DG-AY8	3.5-4	DG-AY8S-3.5-4	1/30/2019	**1.8**	**8.4**	**110**	**0.88**	<0.027	**34**	**14**	**38**	**17**	**0.042**	<0.14	**32**	<0.33	<0.11	<0.30	**40**	**78**
DG-AY9	0.5-1	DG-AY9S-0.5-1	1/21/2019	**0.67**	**8.9**	**120**	**0.51**	**0.81**	**55**	**15**	**48**	**63**	**0.1**	<0.21	**34**	**1.6**	<0.16	<0.32	**53**	**140**
DG-AY9	3.5-4	DG-AY9S-3.5-4	1/21/2019	**0.47**	**6.5**	**110**	**0.62**	**0.26**	**58**	**12**	**19**	**10**	**0.04**	<0.14	**30**	**0.73**	<0.11	<0.47	**53**	**42**
DG-AZ10	0.5-1	DG-AZ10S-0.5-1	1/21/2019	**0.32**	**5.8**	**140**	**0.6**	**0.27**	**38**	**12**	**16**	**6.4**	**0.019**	<0.19	**29**	**0.48**	<0.15	<0.31	**46**	**35**
DG-AZ10	3.5-4	DG-AZ10S-3.5-4	1/21/2019	**0.37**	**7.8**	**99**	**0.51**	**0.28**	**44**	**7.3**	**21**	**8.1**	**0.025**	<0.23	**27**	**1.6**	<0.18	<0.43	**51**	**42**
DG-AZ2	0.5-1	DG-AZ2S-0.5-1	2/1/2019	**4**	**210**	**77**	<0.63	**0.77**	**12**	**5.7**	**610**	**250**	**0.23**	**0.35**	**17**	<0.58	<0.97	<0.52	**39**	**110**
DG-AZ2	3.5-4	DG-AZ2S-3.5-4	2/1/2019	**2.1**	**130**	**62**	**0.38**	**0.23**	**80**	**17**	**55**	**56**	**4.3**	<0.22	**95**	**0.73**	<0.18	<0.56	**64**	**82**
DG-AZ3	0.5-1	DG-AZ3S-0.5-1	2/1/2019	**2.6**	**120**	**34**	<0.10	**0.17**	**8.3**	**9.4**	**89**	**64**	**0.071**	<0.20	**9.1**	**0.64**	<0.16	<0.50	**59**	**64**
DG-AZ3	3.5-4	DG-AZ3S-3.5-4	2/1/2019	**3.5**	**88**	**47**	**0.43**	**1**	**43**	**17**	**20**	**29**	**0.016**	<0.24	**34**	**4.9**	<0.19	<0.46	**68**	**1100**
DG-N1	0.5-1	DG-N1S-0.5-1	12/18/2018	**2.5**	**28**	**56**	<0.095	**0.89**	**21**	**9.6**	**120**	**180**	**0.37**	**1.4**	**26**	**0.89**	**0.27**	**1.4**	**65**	**300**
DG-N1	3.5-4	DG-N1S-3.5-4	12/18/2018	**8.2**	**39**	**110**	**0.25**	**0.3**	**320**	**24**	**21**	**5.8**	**9.4**	**0.43**	**330**	**1**	<0.15	<0.42	**67**	**54**
DG-N10	0.5-1	DG-N10S-0.5-1	1/14/2019	**17**	**18**	**120**	**0.99**	**1**	**27**	**11**	**3600**	**1700**	**2**	**2.4**	**59**	**3.1**	**0.37**	<0.43	**56**	**390**
DG-N10	3.5-4	DG-N10S-3.5-4	1/14/2019	**6**	**4.8**	**43**	**0.23**	**0.21**	**11**	**3.1**	**66**	**240**	**0.081**	**0.63**	**12**	**0.43**	<0.11	<0.46	**14**	**64**
DG-N11	0.5-1	DG-N11S-0.5-1	12/20/2018	**39**	**30**	**200**	<0.31	**2.1**	**36**	**12**	**1700**	**2900**	**0.13**	<0.61	**36**	<1.4	**1.3**	**0.44**	**25**	**1200**
DG-N11	3.5-4	DG-N11S-3.5-4	12/20/2018	**24**	**31**	**340**	<0.20	**0.79**	**42**	**10**	**230**	**6600**	**0.18**	**0.9**	**24**	**1.4**	**0.35**	<1.4	**20**	**900**
DG-N12	0.5-1	DG-N12S-0.5-1	1/14/2019	**3.4**	**89**	**80**	**0.25**	**0.43**	**14**	**13**	**140**	**470**	**0.11**	**0.48**	**12**	**1.1**	<0.14	<0.87	**79**	**250**
DG-N12	3.5-4	DG-N12S-3.5-4	1/14/2019	**1.3**	**26**	**29**	**0.36**	<0.030	**32**	**13**	**92**	**16**	**0.1**	**1.6**	**24**	<0.36	<0.12	**1.1**	**77**	**64**

Table 2: Metals Concentrations in Soil
UPC OU-2
Brisbane, California

Sample Location	Depth Range (ft bgs)	Sample Name	Collection Date	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
Direct Exposure Human Health Risk Level Residential Soil Exposure ESL [1]				1.1E+01	6.7E-02	1.5E+04	1.6E+01	7.8E+01	1.2E+05	2.3E+01	3.1E+03	8.0E+01	1.3E+01	3.9E+02	8.2E+02	3.9E+02	3.9E+02	7.8E-01	3.9E+02	2.3E+04
Regional Background [2]				5.5E+00	1.9E+01	3.2E+02	1.0E+00	2.7E+00	1.0E+02	2.5E+01	6.9E+01	1.6E+01	4.0E-01	7.4E+00	1.2E+02	5.6E+00	1.8E+00	7.6E+00	7.4E+01	1.1E+02
Units				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
DG-N12 (D)	3.5-4	DG-N12 (D)S-3.5-4	1/14/2019	**1.8**	**13**	**25**	**0.68**	**0.13**	**37**	**15**	**53**	**22**	**0.087**	**2.7**	**28**	**0.77**	<0.15	**0.8**	**57**	**66**
DG-N13	0.5-1	DG-N13S-0.5-1	1/10/2019	**1.2**	**3.3**	**120**	**0.3**	**0.18**	**15**	**13**	**93**	**58**	**0.079**	**0.53**	**15**	**1.3**	<0.17	<0.43	**97**	**90**
DG-N13 (D)	0.5-1	DG-N13 (D)S-0.5-1	1/10/2019	**1.7**	**6.7**	**150**	**0.55**	**0.4**	**21**	**14**	**79**	**95**	**0.076**	**0.75**	**27**	**2.7**	<0.19	<0.49	**73**	**140**
DG-N13	3.5-4	DG-N13S-3.5-4	1/10/2019	**0.59**	**2.8**	**50**	**0.23**	<0.044	**130**	**25**	**35**	**7.9**	**0.16**	**0.79**	**120**	**1.4**	<0.18	<0.56	**74**	**57**
DG-N13	7.5-8	DG-N13S-7.5-8	1/10/2019	<0.22	**3.8**	**29**	**0.3**	<0.032	**50**	**8.1**	**5.2**	**2.3**	<0.0024	**0.39**	**21**	<0.39	<0.13	<0.51	**36**	**14**
DG-N14	0.5-1	DG-N14S-0.5-1	1/14/2019	**6.8**	**95**	**120**	**0.22**	**1.4**	**37**	**17**	**250**	**510**	**0.26**	**1.7**	**31**	**1.2**	<0.16	<0.38	**110**	**350**
DG-N14	3.5-4	DG-N14S-3.5-4	1/14/2019	**1.5**	**15**	**160**	**0.66**	<0.034	**58**	**14**	**31**	**7.9**	**0.12**	<0.18	**73**	<0.42	<0.18	**1.7**	**81**	**71**
DG-N15	0.5-1	DG-N15S-0.5-1	12/21/2018	**2.9**	**110**	**95**	**0.78**	**0.4**	**150**	**21**	**62**	**60**	**22**	**0.79**	**180**	<0.50	<0.17	**0.5**	**59**	**87**
DG-N15	3.5-4	DG-N15S-3.5-4	12/21/2018	**3.5**	**39**	**110**	**0.79**	**0.26**	**210**	**28**	**32**	**9.5**	**9**	**0.75**	**380**	**1.5**	<0.11	<0.48	**75**	**56**
DG-N2	0.5-1	DG-N2S-0.5-1	12/13/2018	**1.3**	**180**	**130**	**0.16**	**0.062**	**130**	**23**	**42**	**12**	**0.38**	**0.98**	**160**	**1.5**	<0.16	<0.32	**87**	**96**
DG-N2	3.5-4	DG-N2S-3.5-4	12/13/2018	**3.7**	**180**	**68**	**0.13**	**0.67**	**23**	**12**	**130**	**170**	**0.25**	**1.3**	**25**	**1.5**	<0.17	<0.45	**86**	**140**
DG-N3	0.5-1	DG-N3S-0.5-1	12/13/2018	**1.8**	**28**	**51**	<0.086	**0.63**	**13**	**7.4**	**120**	**160**	**0.14**	**0.25**	**10**	<0.40	**0.24**	<0.48	**69**	**150**
DG-N3	3.5-4	DG-N3S-3.5-4	12/13/2018	**4.5**	**17**	**480**	**0.49**	**1.5**	**82**	**11**	**220**	**940**	**12**	**0.23**	**110**	<0.32	**1.7**	<0.38	**38**	**660**
DG-N4	0.5-1	DG-N4S-0.5-1	12/19/2018	**4.6**	**250**	**82**	<0.11	**1**	**24**	**12**	**380**	**370**	**0.25**	**1.1**	**26**	**2.6**	<0.17	<0.31	**79**	**310**
DG-N4	3.5-4	DG-N4S-3.5-4	12/19/2018	<0.26	**84**	**18**	<0.10	**0.078**	**28**	**4.5**	**6.9**	**3.7**	**0.021**	**0.27**	**23**	**1.2**	<0.16	<0.49	**20**	**17**
DG-N5	0.5-1	DG-N5S-0.5-1	1/8/2019	**2.2**	**9.1**	**99**	**0.11**	**0.85**	**36**	**11**	**110**	**150**	**0.19**	**1.2**	**37**	**2.3**	<0.13	<0.45	**68**	**210**
DG-N5 (D)	0.5-1	DG-N5 (D)S-0.5-1	1/8/2019	**1.3**	**62**	**56**	<0.073	**0.24**	**12**	**13**	**130**	**66**	**0.13**	**0.55**	**9.9**	**1.4**	**0.13**	**0.83**	**96**	**130**
DG-N5 (D)	0.5-1	DG-N5 (D)S-0.5-1	1/24/2019	**2.4**	**15**	**120**	**0.35**	**0.63**	**44**	**9.4**	**91**	**15**	**0.49**	<0.16	**49**	**3**	**0.59**	**0.76**	**36**	**160**
DG-N5	3.5-4	DG-N5S-3.5-4	1/8/2019	**16**	**180**	**700**	<0.23	**1.1**	**41**	**8.9**	**760**	**1700**	**0.72**	**1**	**39**	**7**	**2.3**	**2.9**	**24**	**1600**
DG-N6	0.5-1	DG-N6S-0.5-1	12/19/2018	**5**	**19**	**79**	**0.13**	**6**	**55**	**10**	**1100**	**940**	**0.32**	**8.3**	**47**	**2.2**	**1**	**1.3**	**43**	**750**
DG-N6	3.5-4	DG-N6S-3.5-4	12/19/2018	**8.9**	**9**	**320**	**0.21**	**0.95**	**17**	**3.5**	**300**	**1600**	**0.55**	**1.6**	**13**	**1.8**	**2**	<0.52	**11**	**770**
DG-N7	0.5-1	DG-N7S-0.5-1	12/18/2018	**0.87**	**10**	**15**	<0.12	<0.046	**11**	**15**	**96**	**17**	**0.067**	**0.57**	**6.1**	<0.56	<0.19	**1.2**	**100**	**77**
DG-N7	3.5-4	DG-N7S-3.5-4	12/18/2018	**1.1**	**100**	**58**	<0.083	**0.58**	**15**	**15**	**120**	**290**	**0.072**	**0.17**	**15**	<0.38	**0.17**	<0.54	**100**	**200**
DG-N8	0.5-1	DG-N8S-0.5-1	1/15/2019	**11**	**140**	**1400**	**1.4**	**4.3**	**100**	**27**	**610**	**1300**	**0.42**	**6**	**170**	**3.7**	**0.77**	<0.37	**140**	**1700**
DG-N8	3.5-4	DG-N8S-3.5-4	1/15/2019	**2.5**	**11**	**100**	**1.7**	**0.23**	**43**	**20**	**110**	**35**	**0.047**	**1**	**36**	**1.8**	<0.12	**0.36**	**95**	**72**
DG-N8 (D)	3.5-4	DG-N8 (D)S-3.5-4	1/15/2019	**1.3**	**4.1**	**34**	**0.11**	<0.029	**17**	**12**	**75**	**16**	**0.035**	<0.15	**15**	**0.54**	<0.12	**0.44**	**89**	**51**
DG-N9	0.5-1	DG-N9S-0.5-1	1/10/2019	**1.5**	**32**	**49**	<0.080	**0.24**	**36**	**12**	**110**	**170**	**0.3**	**0.38**	**32**	**1.2**	<0.12	<0.34	**75**	**110**
DG-N9	3.5-4	DG-N9S-3.5-4	1/10/2019	**1.9**	**140**	**63**	**0.67**	<0.036	**48**	**16**	**54**	**26**	**0.18**	**0.2**	**38**	**2**	<0.15	**1.4**	**50**	**110**
DG-O1	0.5-1	DG-O1S-0.5-1	12/13/2018	**1.2**	**28**	**48**	<0.10	**0.2**	**8.2**	**11**	**130**	**150**	**0.11**	<0.20	**8.9**	<0.47	**0.25**	**0.61**	**91**	**100**
DG-O1	3.5-4	DG-O1S-3.5-4	12/13/2018	**2.2**	**3.7**	**140**	**0.25**	**0.086**	**120**	**18**	**30**	**4.7**	**0.66**	**1.6**	**160**	<0.30	**0.15**	<0.45	**57**	**49**
DG-O10	0.5-1	DG-O10S-0.5-1	1/14/2019	**2500**	**97**	**92**	**0.45**	**2**	**25**	**7.6**	**1800**	**17000**	**0.11**	**2.2**	**35**	**1.8**	**6.3**	<0.29	**22**	**600**
DG-O10 (D)	0.5-1	DG-O10 (D)S-0.5-1	1/14/2019	**4300**	**57**	**24**	**0.5**	**4.8**	**50**	**13**	**1300**	**14000**	**0.053**	**5.2**	**77**	**10**	**8.2**	<1.5	**12**	**2800**
DG-O10	3.5-4	DG-O10S-3.5-4	1/14/2019	**4.5**	**13**	**100**	**0.9**	**0.64**	**44**	**15**	**640**	**180**	**0.19**	**0.47**	**48**	**2.4**	<0.13	<1.7	**49**	**300**
DG-O11	0.5-1	DG-O11S-0.5-1	1/10/2019	**1.3**	**9.4**	**39**	**0.34**	<0.031	**32**	**14**	**53**	**68**	**0.049**	**0.21**	**46**	**1**	<0.13	<0.39	**84**	**71**
DG-O11	3.5-4	DG-O11S-3.5-4	1/10/2019	**12**	**59**	**140**	<0.11	**4.3**	**71**	**11**	**680**	**2000**	**0.39**	**1.1**	**61**	**4**	**0.17**	**1.4**	**68**	**570**
DG-O12	0.5-1	DG-O12S-0.5-1	1/14/2019	**8.4**	**25**	**100**	**0.24**	**1.1**	**36**	**11**	**150**	**730**	**0.24**	**1.1**	**46**	**0.73**	<0.20	**1.3**	**59**	**320**
DG-O12	3.5-4	DG-O12S-3.5-4	1/14/2019	**59**	**24**	**240**	**0.49**	**3.8**	**39**	**15**	**6800**	**3700**	**0.17**	**2.5**	**45**	**6.6**	**1.8**	<0.58	**65**	**1700**
DG-O13	0.5-1	DG-O13S-0.5-1	12/21/2018	**880**	**140**	**510**	**0.42**	**2.8**	**78**	**26**	**5900**	**19000**	**0.11**	**5.1**	**270**	<1.6	**4.2**	<2.2	**49**	**990**
DG-O13	3.5-4	DG-O13S-3.5-4	12/21/2018	**12**	**15**	**110**	**0.89**	**1.6**	**42**	**11**	**250**	**910**	**0.28**	**2**	**37**	<0.56	<0.19	<1.5	**69**	**350**
DG-O14	0.5-1	DG-O14S-0.5-1	1/14/2019	**0.35**	**2.4**	**54**	<0.079	**0.079**	**14**	**14**	**140**	**130**	**0.17**	**0.49**	**12**	<0.36	<0.12	<0.54	**100**	**88**
DG-O14	3.5-4	DG-O14S-3.5-4	1/14/2019	**2.1**	**8.5**	**130**	**0.8**	<0.035	**150**	**23**	**56**	**61**	**0.22**	**0.66**	**130**	**1.2**	<0.14	**1.2**	**63**	**140**
DG-O15	0.5-1	DG-O15S-0.5-1	1/10/2019	**2.4**	**75**	**170**	**0.37**	**0.044**	**210**	**29**	**34**	**11**	**17**	**0.53**	**300**	**1.5**	<0.18	<0.41	**81**	**62**
DG-O15	3.5-4	DG-O15S-3.5-4	1/10/2019	**0.44**	**4.6**	**84**	**0.22**	**0.056**	**73**	**8**	**15**	**20**	**0.26**	**0.67**	**36**	**0.62**	<0.12	<0.51	**38**	**77**
DG-O15 (D)	3.5-4	DG-O15 (D)S-3.5-4	1/10/2019	<0.23	**4.5**	**69**	**0.2**	**0.041**	**160**	**13**	**27**	**20**	**0.33**	**0.57**	**92**	**1.9**	<0.14	<0.35	**48**	**75**
DG-O15	7.5-8	DG-O15S-7.5-8	1/10/2019	**0.31**	**1.5**	**49**	**0.21**	**0.038**	**45**	**8.1**	**7.1**	**3.5**	**0.032**	**0.21**	**25**	**0.4**	<0.11	<0.40	**32**	**18**
DG-O2	0.5-1	DG-O2S-0.5-1	12/13/2018	**1.6**	**28**	**51**	<0.094	**0.44**	**19**	**13**	**160**	**72**	**0.077**	**1.4**	**12**	**2**	<0.15	<0.30	**140**	**130**
DG-O2	3.5-4	DG-O2S-3.5-4	12/13/2018	**0.9**	**100**	**110**	**0.08**	<0.025	**130**	**17**	**27**	**5.9**	**1.4**	**0.52**	**130**	**0.72**	<0.10	<0.42	**66**	**50**
DG-O3	0.5-1	DG-O3S-0.5-1	12/18/2018	**0.58**	**37**	**23**	<0.089	**0.35**	**8.1**	**11**	**89**	**14**	**0.061**	**0.41**	**5.6**	**0.72**	<0.14	<0.29	**79**	**72**
DG-O3	3.5-4	DG-O3S-3.5-4	12/18/2018	**4.5**	**39**	**55**	**0.15**	**0.23**	**190**	**14**	**20**	**6**	**4**	**0.4**	**170**	**1.6**	**0.2**	<0.40	**43**	**50**
DG-O4	0.5-1	DG-O4S-0.5-1	12/19/2018	**0.42**	**3.3**	**47**	<0.12	**0.29**	**7.3**	**7.5**	**110**	**29**	**0.09**	**0.32**	**2.9**	**1.2**	<0.19	<0.52	**100**	**86**
DG-O4	3.5-4	DG-O4S-3.5-4	12/19/2018	**0.74**	**48**	**32**	<0.12	**0.11**	**31**	**4.9**	**15**	**34**	**0.024**	**0.45**	**21**	<0.55	<0.18	<0.55	**23**	**43**
DG-O5	0.5-1	DG-O5S-0.5-1	12/18/2018	**0.72**	**94**	**110**	<0.11	**0.18**	**15**	**12**	**190**	**86**	**0.11**	**0.25**	**7.5**	<0.52	**0.19**	<0.53	**130**	**160**

Table 2: Metals Concentrations in Soil
UPC OU-2
Brisbane, California

Sample Location	Depth Range (ft bgs)	Sample Name	Collection Date	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
Direct Exposure Human Health Risk Level Residential Soil Exposure ESL [1]				1.1E+01	6.7E-02	1.5E+04	1.6E+01	7.8E+01	1.2E+05	2.3E+01	3.1E+03	8.0E+01	1.3E+01	3.9E+02	8.2E+02	3.9E+02	3.9E+02	7.8E-01	3.9E+02	2.3E+04
Regional Background [2]				5.5E+00	1.9E+01	3.2E+02	1.0E+00	2.7E+00	1.0E+02	2.5E+01	6.9E+01	1.6E+01	4.0E-01	7.4E+00	1.2E+02	5.6E+00	1.8E+00	7.6E+00	7.4E+01	1.1E+02
Units				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
DG-O5	3.5-4	DG-O5S-3.5-4	12/18/2018	**2**	**410**	**110**	**0.26**	<0.049	**51**	**6.8**	**26**	**29**	**0.034**	**0.26**	**39**	<0.59	<0.20	<0.50	**32**	**65**
DG-O6	0.5-1	DG-O6S-0.5-1	12/19/2018	**1.3**	**2.8**	**54**	**0.17**	**0.67**	**18**	**11**	**130**	**55**	**0.098**	**1.6**	**12**	**1.7**	<0.15	<0.57	**84**	**160**
DG-O6 (D)	0.5-1	DG-O6 (D)S-0.5-1	12/19/2018	**1.8**	**3.6**	**56**	<0.12	**0.92**	**19**	**14**	**250**	**71**	**0.11**	**1.9**	**12**	**2**	<0.18	<0.43	**110**	**750**
DG-O6	3.5-4	DG-O6S-3.5-4	12/19/2018	**12**	**11**	**250**	**0.25**	**1.1**	**14**	**4.1**	**190**	**780**	**0.93**	**0.35**	**14**	**1.4**	**1.1**	<0.51	**19**	**740**
DG-O7	0.5-1	DG-O7S-0.5-1	1/8/2019	<0.24	**0.93**	**34**	<0.096	<0.036	**8.1**	**11**	**97**	**1.2**	**0.069**	<0.19	**3.9**	**0.6**	<0.15	**1.2**	**110**	**36**
DG-O7	3.5-4	DG-O7S-3.5-4	1/8/2019	**0.42**	**1.5**	**32**	<0.083	<0.032	**19**	**12**	**94**	**5.9**	**0.076**	<0.16	**11**	**0.64**	<0.13	**1.5**	**110**	**38**
DG-O8	0.5-1	DG-O8S-0.5-1	1/29/2019	**2.2**	**110**	**62**	**0.2**	**0.78**	**17**	**10**	**180**	**330**	**0.23**	<0.25	**19**	**0.64**	<0.20	**1.5**	**74**	**200**
DG-O8	3.5-4	DG-O8S-3.5-4	1/29/2019	<0.24	**1.3**	**41**	<0.092	<0.035	**44**	**6.2**	**5.7**	**2.8**	**0.011**	<0.18	**29**	<0.43	<0.14	<0.56	**34**	**17**
DG-O9	0.5-1	DG-O9S-0.5-1	12/20/2018	**0.44**	**1.1**	**34**	<0.089	<0.034	**7.3**	**12**	**100**	**27**	**0.067**	<0.18	**7**	<0.41	<0.14	<0.41	**83**	**49**
DG-O9	3.5-4	DG-O9S-3.5-4	12/20/2018	**2.8**	**15**	**61**	**0.8**	<0.044	**37**	**12**	**31**	**34**	**0.037**	<0.23	**27**	<0.53	<0.18	<0.40	**46**	**230**
DG-P1	0.5-1	DG-P1S-0.5-1	11/21/2018	**0.69**	**42**	**53**	<0.11	**0.1**	**23**	**10**	**81**	**59**	**0.07**	<0.21	**14**	<0.50	**0.6**	<0.51	**92**	**66**
DG-P1	3.5-4	DG-P1S-3.5-4	11/21/2018	**2.6**	**55**	**92**	**0.16**	**0.085**	**120**	**17**	**31**	**4.5**	**12**	<0.26	**140**	<0.60	**0.65**	<0.48	**70**	**49**
DG-P1 (D)	3.5-4	DG-P1 (D)S-3.5-4	11/21/2018	**2.9**	**56**	**100**	**0.12**	**0.069**	**130**	**17**	**27**	**7**	**19**	<0.22	**140**	<0.52	**0.65**	<0.58	**79**	**52**
DG-P10	0.5-1	DG-P10S-0.5-1	1/14/2019	**1**	**5.7**	**81**	**0.72**	**0.59**	**40**	**8**	**110**	**300**	**0.089**	**0.59**	**31**	<0.47	<0.16	<0.50	**72**	**130**
DG-P10	3.5-4	DG-P10S-3.5-4	1/14/2019	**1.8**	**2.1**	**78**	**0.27**	**0.1**	**46**	**8.5**	**7.9**	**11**	**0.13**	**0.47**	**37**	**1.3**	<0.16	<0.46	**47**	**43**
DG-P11	0.5-1	DG-P11S-0.5-1	12/20/2018	**1.6**	**1.3**	**48**	<0.069	**0.04**	**60**	**6.3**	**25**	**76**	**0.15**	<0.14	**63**	<0.32	<0.11	<0.45	**26**	**37**
DG-P12	0.5-1	DG-P12S-0.5-1	1/14/2019	**10**	**6**	**86**	**0.12**	**0.92**	**30**	**3.2**	**260**	**1600**	**0.16**	**0.54**	**17**	**1**	**0.13**	<0.31	**15**	**240**
DG-P12	3.5-4	DG-P12S-3.5-4	1/14/2019	**28**	**9.6**	**130**	**0.3**	**0.21**	**29**	**7.5**	**860**	**1000**	**0.29**	**1.7**	**67**	**1.5**	<0.16	<0.30	**94**	**140**
DG-P13	0.5-1	DG-P13S-0.5-1	1/10/2019	**1**	**1.4**	**37**	**0.17**	**0.26**	**18**	**11**	**110**	**150**	**0.038**	**0.52**	**7.4**	**1.6**	<0.17	<0.45	**110**	**110**
DG-P13	3.5-4	DG-P13S-3.5-4	1/10/2019	**3.6**	**16**	**72**	**0.84**	**2.3**	**32**	**18**	**300**	**790**	**0.053**	**1.2**	**47**	**2**	<0.17	<0.48	**41**	**330**
DG-P13 (D)	3.5-4	DG-P13 (D)S-3.5-4	1/10/2019	**3**	**15**	**53**	**0.87**	**0.72**	**37**	**16**	**150**	**200**	**0.079**	**1.1**	**46**	**2.5**	<0.14	**0.85**	**43**	**310**
DG-P14	0.5-1	DG-P14S-0.5-1	1/14/2019	**200**	**35**	**94**	**0.13**	**0.28**	**21**	**14**	**1200**	**3200**	**0.19**	**0.48**	**24**	<0.53	**0.6**	<0.40	**96**	**240**
DG-P14	3.5-4	DG-P14S-3.5-4	1/14/2019	**4.7**	**14**	**1100**	**1.4**	**0.62**	**140**	**19**	**220**	**920**	**3.4**	**1.7**	**130**	<0.83	**1**	**1.3**	**86**	**550**
DG-P14 (D)	3.5-4	DG-P14 (D)S-3.5-4	1/14/2019	**4**	**19**	**1500**	**1.9**	**0.63**	**110**	**19**	**300**	**2500**	**3**	**4.5**	**110**	<1.0	**0.48**	**0.93**	**120**	**610**
DG-P15	0.5-1	DG-P15S-0.5-1	12/21/2018	**2.4**	**12**	**71**	**0.84**	**0.68**	**32**	**15**	**220**	**250**	**0.35**	**0.77**	**40**	<0.53	<0.18	<0.97	**88**	**160**
DG-P15	3.5-4	DG-P15S-3.5-4	12/21/2018	**1.5**	**3.7**	**48**	**1.2**	**0.31**	**440**	**39**	**62**	**13**	**0.1**	**1.1**	**480**	**0.8**	<0.19	<0.51	**95**	**84**
DG-P2	0.5-1	DG-P2S-0.5-1	12/13/2018	**2**	**170**	**37**	<0.093	**0.13**	**8.3**	**13**	**130**	**46**	**0.088**	**0.65**	**6.7**	**0.56**	<0.14	<0.54	**140**	**90**
DG-P2 (D)	0.5-1	DG-P2 (D)S-0.5-1	12/13/2018	**2.8**	**260**	**45**	<0.12	**0.26**	**10**	**12**	**130**	**120**	**0.074**	**0.6**	**12**	**1.1**	<0.19	<0.41	**120**	**180**
DG-P2	3.5-4	DG-P2S-3.5-4	12/13/2018	**1.3**	**78**	**350**	**0.91**	**0.098**	**42**	**18**	**50**	**24**	**0.074**	**0.83**	**56**	**0.98**	<0.20	<0.53	**37**	**110**
DG-P3	0.5-1	DG-P3S-0.5-1	12/13/2018	**4**	**250**	**160**	<0.10	**2.3**	**25**	**7.1**	**120**	**380**	**0.51**	**0.35**	**31**	**0.66**	**0.46**	<0.57	**27**	**320**
DG-P3	3.5-4	DG-P3S-3.5-4	12/13/2018	**1.9**	**140**	**64**	**0.32**	**0.072**	**47**	**14**	**36**	**20**	**0.77**	<0.18	**66**	<0.43	<0.15	**0.6**	**52**	**61**
DG-P4	0.5-1	DG-P4S-0.5-1	12/19/2018	**6.8**	**630**	**220**	<0.13	**2.5**	**37**	**9.1**	**190**	**610**	**0.31**	**1**	**41**	**2.1**	**0.58**	<0.42	**41**	**500**
DG-P4	3.5-4	DG-P4S-3.5-4	12/19/2018	**0.98**	**68**	**46**	**0.25**	**0.32**	**42**	**6.1**	**20**	**21**	**0.033**	**0.4**	**34**	**1.3**	<0.15	**1.7**	**30**	**52**
DG-P5	0.5-1	DG-P5S-0.5-1	1/8/2019	**2.1**	**42**	**68**	<0.092	**1.1**	**24**	**14**	**180**	**190**	**0.12**	**1.3**	**20**	**2.9**	**0.26**	<0.42	**100**	**220**
DG-P5	3.5-4	DG-P5S-3.5-4	1/8/2019	**1.4**	**150**	**100**	**0.41**	**0.24**	**26**	**7.2**	**35**	**170**	**0.21**	**0.19**	**34**	**1.1**	**0.18**	<0.41	**26**	**120**
DG-P6	0.5-1	DG-P6S-0.5-1	12/19/2018	**7.1**	**21**	**450**	**0.17**	**1.3**	**20**	**7.7**	**300**	**750**	**0.25**	**0.53**	**21**	**0.85**	**2**	**0.67**	**55**	**630**
DG-P6	3.5-4	DG-P6S-3.5-4	12/19/2018	**28**	**19**	**940**	**0.55**	**3.1**	**30**	**7.7**	**540**	**2400**	**0.25**	**0.53**	**43**	**3.7**	**3.7**	<0.45	**27**	**1700**
DG-P7	0.5-1	DG-P7S-0.5-1	12/18/2018	**2.8**	**20**	**130**	<0.10	**7.3**	**38**	**9.6**	**870**	**1900**	**0.16**	**4.5**	**45**	**0.62**	**3.6**	**2.1**	**68**	**760**
DG-P7	3.5-4	DG-P7S-3.5-4	12/18/2018	**0.48**	**0.98**	**32**	<0.12	**0.12**	**13**	**12**	**130**	**13**	**0.051**	**0.28**	**5.2**	<0.56	<0.19	<0.45	**110**	**58**
DG-P7	8.5-9	DG-P7S-8.5-9	12/18/2018	**0.64**	**5.5**	**39**	**0.26**	**0.07**	**56**	**6.8**	**25**	**29**	**0.22**	**0.77**	**44**	**0.58**	<0.17	<0.54	**47**	**72**
DG-P8	0.5-1	DG-P8S-0.5-1	12/18/2018	**0.9**	**18**	**68**	<0.13	**0.59**	**18**	**12**	**160**	**490**	**0.068**	**0.35**	**10**	<0.59	<0.20	<0.50	**120**	**120**
DG-P8	3.5-4	DG-P8S-3.5-4	12/18/2018	**0.65**	**2.4**	**41**	<0.079	<0.030	**47**	**4.6**	**6.7**	**1.1**	**0.47**	<0.16	**35**	<0.36	<0.12	<0.57	**40**	**19**
DG-P9	0.5-1	DG-P9S-0.5-1	11/21/2018	**0.56**	**0.79**	**26**	<0.13	**0.12**	**11**	**13**	**94**	**6.4**	**0.038**	<0.25	**5.5**	**0.69**	**0.76**	<0.35	**110**	**45**
DG-P9	3.5-4	DG-P9S-3.5-4	11/21/2018	**5.4**	**19**	**33**	**1.1**	**0.57**	**28**	**13**	**41**	**64**	**0.19**	**0.39**	**38**	<0.59	**0.54**	<0.56	**45**	**520**
DG-Q1	0.5-1	DG-Q1S-0.5-1	12/13/2018	**1.7**	**79**	**87**	<0.12	**0.61**	**25**	**9.9**	**100**	**120**	**0.37**	**1.2**	**28**	**0.58**	<0.19	<0.57	**79**	**210**
DG-Q1	3.5-4	DG-Q1S-3.5-4	12/13/2018	**2.4**	**8.7**	**130**	**0.24**	**0.11**	**130**	**18**	**29**	**4.1**	**0.54**	<0.15	**160**	<0.36	**0.21**	<0.55	**67**	**52**
DG-Q10	0.5-1	DG-Q10S-0.5-1	1/14/2019	<0.47	**6.6**	**73**	**0.33**	**0.2**	**9.1**	**5.9**	**52**	**58**	**0.039**	**0.49**	**9.4**	<0.85	<0.11	<0.35	**41**	**49**
DG-Q10	3.5-4	DG-Q10S-3.5-4	1/14/2019	**1.3**	**2.3**	**110**	**0.83**	**0.085**	**83**	**22**	**9.4**	**4.9**	**0.054**	**0.55**	**45**	**0.74**	<0.10	**1.1**	**50**	**29**
DG-Q11	0.5-1	DG-Q11S-0.5-1	1/10/2019	**3.1**	**9.1**	**75**	<0.081	**0.18**	**21**	**13**	**170**	**420**	**0.14**	**0.51**	**17**	**1.5**	<0.13	<0.29	**84**	**140**
DG-Q11 (D)	0.5-1	DG-Q11 (D)S-0.5-1	1/10/2019	**4.2**	**7.5**	**55**	<0.12	**0.13**	**16**	**11**	**130**	**430**	**0.16**	<0.23	**13**	**1.2**	<0.18	**1.3**	**71**	**110**
DG-Q11	3.5-4	DG-Q11S-3.5-4	1/10/2019	**2.5**	**14**	**47**	**0.72**	<0.045	**37**	**18**	**77**	**48**	**0.093**	<0.23	**43**	**2.1**	<0.18	**1.1**	**47**	**98**
DG-Q12	0.5-1	DG-Q12S-0.5-1	1/14/2019	**3.4**	**6.2**	**23**	**0.15**	**0.35**	**17**	**4.7**	**180**	**380**	**0.28**	**0.69**	**27**	**0.52**	<0.15	<0.52	**21**	**77**

Table 2: Metals Concentrations in Soil
UPC OU-2
Brisbane, California

Sample Location	Depth Range (ft bgs)	Sample Name	Collection Date	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
Direct Exposure Human Health Risk Level Residential Soil Exposure ESL [1]				1.1E+01	6.7E-02	1.5E+04	1.6E+01	7.8E+01	1.2E+05	2.3E+01	3.1E+03	8.0E+01	1.3E+01	3.9E+02	8.2E+02	3.9E+02	3.9E+02	7.8E-01	3.9E+02	2.3E+04
Regional Background [2]				5.5E+00	1.9E+01	3.2E+02	1.0E+00	2.7E+00	1.0E+02	2.5E+01	6.9E+01	1.6E+01	4.0E-01	7.4E+00	1.2E+02	5.6E+00	1.8E+00	7.6E+00	7.4E+01	1.1E+02
Units				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
DG-Q12	3.5-4	DG-Q12S-3.5-4	1/14/2019	**0.55**	**2.7**	**25**	**0.28**	<0.049	**16**	**14**	**92**	**17**	**0.044**	**0.53**	**13**	**1.3**	<0.20	<0.43	**91**	**73**
DG-Q13	0.5-1	DG-Q13S-0.5-1	12/21/2018	**1.2**	**1.1**	**26**	**1.3**	**0.32**	**22**	**14**	**150**	**170**	**0.056**	**1.2**	**10**	**1.1**	<0.12	<0.57	**100**	**76**
DG-Q13	3.5-4	DG-Q13S-3.5-4	12/21/2018	**2.3**	**1.7**	**330**	**1.8**	**0.32**	**67**	**34**	**82**	**19**	**0.2**	**0.91**	**48**	**2.3**	<0.14	<0.33	**140**	**52**
DG-Q14	0.5-1	DG-Q14S-0.5-1	1/14/2019	**6.3**	**6.6**	**110**	**0.21**	**1.2**	**44**	**9.9**	**320**	**680**	**0.18**	**1.8**	**34**	<0.56	<0.19	<0.39	**66**	**400**
DG-Q14	3.5-4	DG-Q14S-3.5-4	1/14/2019	**0.8**	**2**	**88**	**0.36**	<0.025	**71**	**10**	**15**	**5**	**0.026**	<0.13	**36**	<0.31	<0.10	<0.54	**74**	**36**
DG-Q15	0.5-1	DG-Q15S-0.5-1	1/11/2019	**5.8**	**3.4**	**51**	**0.19**	<0.039	**9**	**13**	**330**	**3300**	**0.054**	**0.52**	**11**	**1.4**	<0.16	**1**	**82**	**84**
DG-Q15 (D)	0.5-1	DG-Q15 (D)S-0.5-1	1/11/2019	**3.2**	**4.1**	**79**	**0.15**	<0.039	**28**	**12**	**160**	**330**	**0.093**	**0.4**	**23**	**1.8**	<0.16	**1.4**	**68**	**91**
DG-Q15	3.5-4	DG-Q15S-3.5-4	1/11/2019	**6.8**	**11**	**450**	**0.64**	**0.5**	**57**	**11**	**170**	**270**	**0.12**	**1.1**	**41**	**2.7**	<0.14	**0.82**	**73**	**130**
DG-Q15	7.5-8	DG-Q15S-7.5-8	1/11/2019	**0.46**	**1.4**	**64**	**0.16**	<0.030	**39**	**2.7**	**4.5**	**4.4**	**0.0055**	**0.21**	**7.9**	<0.36	<0.12	**1**	**26**	**10**
DG-Q16	0.5-1	DG-Q16S-0.5-1	1/14/2019	**2.1**	**120**	**81**	**0.56**	**0.49**	**87**	**20**	**110**	**110**	**1.2**	**0.3**	**96**	**1.1**	<0.15	**0.51**	**75**	**150**
DG-Q16	3.5-4	DG-Q16S-3.5-4	1/14/2019	**2.7**	**4**	**110**	**0.36**	<0.034	**260**	**28**	**46**	**4.6**	**0.1**	**0.25**	**290**	<0.41	<0.14	**0.93**	**91**	**57**
DG-Q2	0.5-1	DG-Q2S-0.5-1	12/13/2018	**5.3**	**46**	**79**	**0.15**	**0.56**	**18**	**9.4**	**150**	**2200**	**0.21**	**0.9**	**33**	**1.5**	<0.19	**1.1**	**43**	**140**
DG-Q2	3.5-4	DG-Q2S-3.5-4	12/13/2018	**3.5**	**140**	**59**	<0.12	<0.047	**68**	**9.5**	**16**	**22**	**0.33**	**0.26**	**53**	**0.7**	<0.19	<0.55	**58**	**34**
DG-Q3	0.5-1	DG-Q3S-0.5-1	12/18/2018	**0.68**	**86**	**42**	<0.080	**0.23**	**7.6**	**11**	**85**	**30**	**0.046**	**0.39**	**4.6**	**0.53**	<0.12	<0.55	**81**	**50**
DG-Q3	3.5-4	DG-Q3S-3.5-4	12/18/2018	**1.6**	**2.5**	**23**	**0.17**	**0.18**	**45**	**7.9**	**6.2**	**2.6**	**0.013**	**0.34**	**32**	**0.72**	<0.10	<0.36	**39**	**23**
DG-Q4	0.5-1	DG-Q4S-0.5-1	12/19/2018	**0.99**	**16**	**61**	<0.11	**0.61**	**14**	**8.7**	**77**	**150**	**0.06**	**0.69**	**13**	**1.1**	<0.18	<0.29	**53**	**170**
DG-Q4	3.5-4	DG-Q4S-3.5-4	12/19/2018	**0.57**	**13**	**81**	**0.14**	**0.41**	**38**	**5.5**	**86**	**140**	**1.4**	**0.51**	**29**	**1.1**	<0.18	<0.50	**27**	**210**
DG-Q4 (D)	3.5-4	DG-Q4 (D)S-3.5-4	12/19/2018	**0.6**	**22**	**93**	**0.18**	**0.55**	**39**	**5.1**	**31**	**120**	**0.055**	**0.38**	**30**	**0.5**	<0.15	<0.51	**25**	**310**
DG-Q5	0.5-1	DG-Q5S-0.5-1	12/18/2018	**2.7**	**48**	**130**	**0.15**	**1.8**	**25**	**12**	**240**	**340**	**0.26**	**1.1**	**23**	<0.50	**0.67**	<0.43	**98**	**580**
DG-Q5	3.5-4	DG-Q5S-3.5-4	12/18/2018	**2.7**	**140**	**160**	**0.15**	**0.3**	**56**	**12**	**77**	**150**	**0.24**	<0.23	**74**	<0.53	**0.38**	<0.48	**37**	**170**
DG-Q6	0.5-1	DG-Q6S-0.5-1	12/19/2018	**1**	**2.7**	**67**	<0.080	**0.13**	**24**	**7.3**	**100**	**110**	**0.11**	**0.36**	**22**	**0.55**	**0.12**	<0.51	**64**	**89**
DG-Q6	3.5-4	DG-Q6S-3.5-4	12/19/2018	**26**	**47**	**1200**	**0.49**	**3.6**	**52**	**13**	**1400**	**4200**	**0.61**	**2.7**	**47**	**2.8**	**7.3**	<0.36	**37**	**2500**
DG-Q7	0.5-1	DG-Q7S-0.5-1	1/8/2019	**6.7**	**15**	**150**	**0.11**	**3.8**	**42**	**9.3**	**270**	**760**	**0.35**	**3.8**	**42**	**1.8**	**0.57**	**1.8**	**40**	**570**
DG-Q7	3.5-4	DG-Q7S-3.5-4	1/8/2019	**18**	**12**	**51**	<0.12	**1.7**	**17**	**4.5**	**210**	**940**	**0.27**	**0.39**	**13**	**2**	**0.42**	**0.59**	**27**	**900**
DG-Q7 (D)	3.5-4	DG-Q7 (D)S-3.5-4	1/8/2019	**8.6**	**11**	**130**	**0.092**	**2.4**	**49**	**8.6**	**210**	**390**	**0.26**	**3.2**	**66**	**1.6**	**0.39**	<0.53	**35**	**410**
DG-Q8	0.5-1	DG-Q8S-0.5-1	1/15/2019	**12**	**23**	**160**	**0.62**	**3.3**	**97**	**15**	**1000**	**780**	**0.23**	**9.5**	**85**	**7**	<0.34	<0.36	**71**	**780**
DG-Q8	3.5-4	DG-Q8S-3.5-4	1/15/2019	**2.6**	**4.8**	**67**	**0.44**	**0.27**	**20**	**9.2**	**97**	**150**	**0.16**	**0.55**	**18**	**0.5**	<0.12	**1.7**	**66**	**140**
DG-Q9	0.5-1	DG-Q9S-0.5-1	12/20/2018	**1.9**	**12**	**49**	<0.066	**0.52**	**22**	**7.7**	**97**	**280**	**0.52**	**0.19**	**20**	<0.30	<0.10	**0.44**	**53**	**130**
DG-Q9	3.5-4	DG-Q9S-3.5-4	12/20/2018	**36**	**380**	**86**	**0.35**	**1.1**	**95**	**13**	**620**	**1500**	**2.7**	**0.56**	**100**	<0.38	**0.53**	<0.29	**54**	**230**
DG-R1	0.5-1	DG-R1S-0.5-1	12/17/2018	**3.5**	**320**	**90**	**0.11**	**1.6**	**42**	**14**	**150**	**200**	**0.49**	**1.8**	**49**	**1.4**	**0.29**	**1.7**	**73**	**270**
DG-R1	3.5-4	DG-R1S-3.5-4	12/17/2018	**1.5**	**49**	**59**	**0.69**	**0.32**	**46**	**15**	**35**	**16**	**0.19**	**0.37**	**46**	**0.63**	<0.20	<0.42	**44**	**72**
DG-R10	0.5-1	DG-R10S-0.5-1	1/29/2019	**0.75**	**7.2**	**130**	**0.38**	<0.10	**95**	**15**	**26**	**45**	**0.053**	<0.53	**59**	<1.3	**0.51**	<0.57	**83**	**100**
DG-R10	3.5-4	DG-R10S-3.5-4	1/29/2019	**4.1**	**21**	**51**	**0.86**	<0.039	**28**	**16**	**33**	**36**	**0.052**	**0.34**	**29**	<0.47	<0.16	<1.2	**33**	**91**
DG-R11	0.5-1	DG-R11S-0.5-1	12/20/2018	**1**	**120**	**50**	<0.12	<0.044	**57**	**8.3**	**12**	**6.4**	**0.036**	<0.23	**29**	**0.63**	<0.18	<0.45	**59**	**23**
DG-R11	3.5-4	DG-R11S-3.5-4	12/20/2018	**1.8**	**41**	**51**	**0.48**	**0.048**	**27**	**15**	**44**	**50**	**0.045**	**0.25**	**33**	<0.32	<0.11	<0.52	**32**	**87**
DG-R11	7.5-8	DG-R11S-7.5-8	12/20/2018	**0.9**	**4.6**	**27**	**0.24**	<0.033	**49**	**8.4**	**23**	**6.1**	**0.048**	**0.57**	**45**	**0.49**	<0.13	<0.31	**37**	**50**
DG-R12	0.5-1	DG-R12S-0.5-1	1/28/2019	**7.5**	**6.7**	**78**	**0.11**	**1.2**	**37**	**11**	**630**	**1200**	**0.41**	**0.86**	**30**	**1.6**	**0.21**	<0.38	**62**	**450**
DG-R12	3.5-4	DG-R12S-3.5-4	1/28/2019	**0.52**	**2.2**	**200**	**0.26**	**0.29**	**60**	**21**	**32**	**9.7**	**0.19**	<0.21	**36**	**0.91**	<0.17	<0.47	**120**	**70**
DG-R13	0.5-1	DG-R13S-0.5-1	1/28/2019	**54**	**7.9**	**110**	**0.47**	**0.2**	**28**	**13**	**490**	**1100**	**0.066**	**1**	**37**	<0.52	**0.23**	<0.48	**49**	**130**
DG-R13	3.5-4	DG-R13S-3.5-4	1/28/2019	**0.93**	**1.1**	**170**	**0.11**	<0.041	**64**	**17**	**27**	**13**	**0.17**	<0.21	**28**	**0.71**	<0.17	<0.50	**130**	**44**
DG-R14	0.5-1	DG-R14S-0.5-1	1/28/2019	<0.32	**2**	**80**	**0.19**	**0.24**	**53**	**10**	**89**	**59**	**0.18**	<0.25	**69**	<0.58	<0.20	**0.85**	**30**	**50**
DG-R14 (D)	0.5-1	DG-R14 (D)S-0.5-1	1/28/2019	<0.26	**3.9**	**120**	**0.16**	**0.31**	**59**	**18**	**54**	**56**	**0.077**	<0.20	**68**	<0.47	<0.16	<0.56	**65**	**60**
DG-R14	3.5-4	DG-R14S-3.5-4	1/28/2019	<0.29	**1.4**	**74**	**0.15**	**0.29**	**50**	**8.3**	**38**	**44**	**0.12**	<0.22	**62**	<0.52	<0.18	<0.46	**22**	**53**
DG-R15	0.5-1	DG-R15S-0.5-1	12/21/2018	**9.9**	**4.1**	**240**	<0.098	**2.9**	**19**	**3.1**	**1300**	**960**	**0.15**	**0.6**	**18**	<0.45	**0.49**	**1.2**	**10**	**480**
DG-R15	3.5-4	DG-R15S-3.5-4	12/21/2018	**1.7**	**2.6**	**160**	<0.13	**1.2**	**14**	**2.7**	**90**	**610**	**0.18**	**0.4**	**9.5**	<0.59	<0.20	<0.44	**8.7**	**310**
DG-R16	0.5-1	DG-R16S-0.5-1	1/28/2019	**5.6**	**17**	**73**	**0.19**	**0.78**	**26**	**13**	**450**	**520**	**2.1**	**0.31**	**38**	<0.57	<0.19	<0.57	**85**	**190**
DG-R16	3.5-4	DG-R16S-3.5-4	1/28/2019	**1.6**	**56**	**86**	**0.47**	**0.21**	**140**	**16**	**42**	**40**	**9.3**	<0.24	**170**	**0.67**	<0.19	**1.7**	**54**	**55**
DG-R16	19.5-20	DG-R16S-19.5-20	1/28/2019	**0.97**	**0.98**	**74**	**0.15**	**0.13**	**52**	**8.6**	**9.9**	**3.5**	**0.022**	<0.21	**32**	<0.49	<0.16	<0.54	**46**	**23**
DG-R2	0.5-1	DG-R2S-0.5-1	12/13/2018	**5.7**	**210**	**110**	<0.10	**0.43**	**86**	**16**	**130**	**150**	**0.98**	**0.85**	**98**	**1.4**	<0.16	**0.78**	**80**	**160**
DG-R2	3.5-4	DG-R2S-3.5-4	2/5/2019	**1**	**1.8**	**20**	**0.076**	<0.028	**23**	**3.1**	**4**	**1.1**	**0.016**	<0.15	**21**	**0.35**	<0.11	<0.45	**19**	**11**
DG-R2 (D)	3.5-4	DG-R2 (D)S-3.5-4	2/5/2019	**0.93**	**1.8**	**23**	**0.081**	<0.028	**30**	**3.8**	**4.6**	**1.2**	**0.022**	**0.15**	**24**	**0.77**	<0.11	**0.4**	**24**	**12**
DG-R3	0.5-1	DG-R3S-0.5-1	12/13/2018	**0.87**	**82**	**40**	<0.076	**0.26**	**10**	**11**	**630**	**52**	**0.069**	<0.15	**7.5**	<0.35	**0.44**	<0.33	**89**	**140**

Table 2: Metals Concentrations in Soil
UPC OU-2
Brisbane, California

Sample Location	Depth Range (ft bgs)	Sample Name	Collection Date	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
Direct Exposure Human Health Risk Level Residential Soil Exposure ESL [1]				1.1E+01	6.7E-02	1.5E+04	1.6E+01	7.8E+01	1.2E+05	2.3E+01	3.1E+03	8.0E+01	1.3E+01	3.9E+02	8.2E+02	3.9E+02	3.9E+02	7.8E-01	3.9E+02	2.3E+04
Regional Background [2]				5.5E+00	1.9E+01	3.2E+02	1.0E+00	2.7E+00	1.0E+02	2.5E+01	6.9E+01	1.6E+01	4.0E-01	7.4E+00	1.2E+02	5.6E+00	1.8E+00	7.6E+00	7.4E+01	1.1E+02
Units				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
DG-R3	3.5-4	DG-R3S-3.5-4	12/13/2018	**1.2**	**3.9**	**38**	**0.082**	<0.028	**58**	**6.1**	**9.3**	**1.4**	**0.023**	<0.14	**36**	**0.34**	**0.16**	<0.34	**44**	**22**
DG-R4	0.5-1	DG-R4S-0.5-1	12/19/2018	**1.7**	**22**	**57**	<0.12	**0.5**	**20**	**11**	**110**	**150**	**0.12**	**1.6**	**20**	**2.6**	<0.19	<0.32	**66**	**550**
DG-R4	3.5-4	DG-R4S-3.5-4	12/19/2018	**19**	**120**	**1000**	**0.67**	**1.4**	**37**	**11**	**1100**	**2300**	**0.31**	**4.9**	**50**	<1.4	**4.2**	<0.54	**38**	**1600**
DG-R4	9.5-10	DG-R4S-9.5-10	12/19/2018	**1.6**	**30**	**53**	**0.5**	**0.31**	**52**	**13**	**84**	**18**	**0.033**	**1.1**	**64**	**0.62**	<0.19	**1.9**	**56**	**180**
DG-R5	0.5-1	DG-R5S-0.5-1	1/29/2019	**1.2**	**53**	**99**	<0.080	**1**	**16**	**11**	**110**	**230**	**0.2**	**0.47**	**14**	**0.93**	**0.15**	<0.56	**78**	**310**
DG-R5	3.5-4	DG-R5S-3.5-4	1/29/2019	**2**	**170**	**75**	**0.095**	**0.63**	**28**	**8.1**	**65**	**370**	**0.077**	**0.18**	**43**	**0.54**	**0.32**	<0.36	**37**	**190**
DG-R5 (D)	3.5-4	DG-R5 (D)S-3.5-4	1/29/2019	**0.69**	**22**	**30**	<0.097	**0.21**	**7.3**	**7.9**	**96**	**53**	**0.089**	<0.19	**4.2**	<0.45	**0.15**	<0.31	**69**	**69**
DG-R6	0.5-1	DG-R6S-0.5-1	12/19/2018	**9.7**	**12**	**200**	**0.44**	**4**	**66**	**23**	**5400**	**790**	**0.66**	**5.4**	**65**	**0.79**	**1.9**	<0.43	**58**	**980**
DG-R6	3.5-4	DG-R6S-3.5-4	12/19/2018	**4.3**	**9.6**	**260**	<0.13	**0.71**	**32**	**7.7**	**240**	**630**	**0.14**	<0.26	**18**	**1**	**1.1**	<0.49	**47**	**600**
DG-R7	0.5-1	DG-R7S-0.5-1	12/19/2018	**1.8**	**6**	**120**	**0.32**	**0.86**	**27**	**7.2**	**97**	**140**	**0.11**	**1.1**	**28**	**1.2**	<0.15	<0.58	**39**	**150**
DG-R7	3.5-4	DG-R7S-3.5-4	12/19/2018	**21**	**38**	**400**	**0.5**	**2.7**	**39**	**10**	**790**	**4000**	**0.054**	**3.1**	**67**	**1.8**	**9.9**	<0.43	**23**	**1300**
DG-R7	8-8.5	DG-R7S-8-8.5	12/19/2018	**38**	**24**	**670**	**0.31**	**2.6**	**34**	**8.4**	**630**	**3800**	**0.15**	**3.6**	**33**	**2**	**3.8**	<0.39	**25**	**1900**
DG-R8	0.5-1	DG-R8S-0.5-1	1/29/2019	<0.29	<0.30	**34**	**0.29**	<0.044	**9.4**	**9.9**	**110**	**2.9**	**0.082**	<0.22	**4.6**	<0.53	<0.18	**0.98**	**84**	**37**
DG-R8	3.5-4	DG-R8S-3.5-4	1/29/2019	**0.36**	**1.6**	**29**	**0.16**	<0.027	**6.7**	**5.1**	**73**	**220**	**0.062**	<0.14	**2.7**	<0.33	**0.12**	<0.51	**51**	**99**
DG-R9	0.5-1	DG-R9S-0.5-1	1/22/2019	**2.1**	**41**	**44**	<0.086	**0.29**	**17**	**13**	**96**	**120**	**0.15**	**0.21**	**63**	**0.56**	<0.13	<0.32	**25**	**77**
DG-R9	3.5-4	DG-R9S-3.5-4	1/22/2019	**0.87**	**240**	**96**	**0.47**	**0.2**	**86**	**16**	**38**	**15**	**3.4**	<0.26	**120**	<0.60	<0.20	<0.38	**59**	**70**
DG-S1	0.5-1	DG-S1S-0.5-1	12/13/2018	**0.59**	**18**	**41**	<0.10	<0.040	**11**	**9.5**	**93**	**53**	**0.24**	<0.21	**15**	<0.48	<0.16	<0.58	**72**	**84**
DG-S1	3.5-4	DG-S1S-3.5-4	12/13/2018	**2.4**	**35**	**91**	**0.65**	**0.075**	**76**	**16**	**55**	**17**	**0.22**	**0.27**	**64**	<0.51	<0.17	<0.47	**47**	**82**
DG-S10	0.5-1	DG-S10S-0.5-1	1/14/2019	**0.57**	**5**	**12**	**0.093**	**0.12**	**8.9**	**1.6**	**32**	**110**	**0.031**	**1.1**	**9.5**	**0.59**	<0.13	<0.49	**5.4**	**27**
DG-S10	3.5-4	DG-S10S-3.5-4	1/14/2019	**4.2**	**8.5**	**68**	**0.12**	**1.3**	**24**	**4.8**	**340**	**820**	**0.21**	**1**	**30**	<0.57	<0.19	<0.39	**20**	**480**
DG-S11	0.5-1	DG-S11S-0.5-1	1/10/2019	**0.37**	**1.2**	**55**	<0.086	<0.033	**9.7**	**7.4**	**37**	**39**	**0.049**	<0.17	**3.1**	<0.39	<0.13	<0.55	**53**	**48**
DG-S11	3.5-4	DG-S11S-3.5-4	1/10/2019	**26**	**31**	**100**	**0.34**	**0.34**	**22**	**13**	**1600**	**1300**	**2.3**	**3.6**	**120**	**5.5**	<0.29	**1**	**75**	**130**
DG-S12	0.5-1	DG-S12S-0.5-1	1/14/2019	<0.30	**4.7**	**160**	**0.36**	**0.1**	**81**	**20**	**34**	**9.1**	**0.097**	**0.53**	**92**	<0.55	<0.18	<0.82	**87**	**53**
DG-S12 (D)	0.5-1	DG-S12 (D)S-0.5-1	1/14/2019	<0.18	**3.1**	**140**	**0.52**	**0.031**	**87**	**19**	**26**	**6.6**	**0.11**	**0.57**	**87**	**0.56**	<0.11	<0.53	**69**	**42**
DG-S12	3.5-4	DG-S12S-3.5-4	1/14/2019	**1.3**	**9.9**	**58**	**1.3**	**0.15**	**40**	**23**	**51**	**54**	**0.09**	**0.81**	**43**	**1.4**	<0.12	<0.32	**48**	**100**
DG-S13	0.5-1	DG-S13S-0.5-1	12/21/2018	<0.27	**3.6**	**65**	**0.29**	**0.29**	**66**	**17**	**35**	**58**	**0.066**	**0.62**	**62**	<0.49	<0.16	<0.35	**64**	**58**
DG-S13	3.5-4	DG-S13S-3.5-4	12/21/2018	**0.57**	**2.7**	**62**	**0.24**	**0.37**	**96**	**23**	**44**	**8.3**	**0.097**	**0.76**	**80**	<0.41	<0.14	<0.47	**98**	**83**
DG-S14	0.5-1	DG-S14S-0.5-1	1/14/2019	**8.9**	**5.4**	**250**	<0.081	**1.1**	**53**	**10**	**1100**	**1200**	**1.1**	**1.9**	**58**	**0.85**	<0.13	<0.40	**40**	**300**
DG-S14	3.5-4	DG-S14S-3.5-4	1/14/2019	**1.5**	**8.9**	**67**	**0.89**	<0.044	**43**	**19**	**37**	**58**	**0.028**	**0.38**	**40**	**0.62**	<0.18	**0.46**	**52**	**190**
DG-S15	0.5-1	DG-S15S-0.5-1	1/11/2019	**130**	**21**	**48**	<0.11	**0.18**	**23**	**13**	**120000**	**1100**	**0.47**	**0.63**	**210**	**1.5**	**2.4**	<0.51	**74**	**140**
DG-S15	3.5-4	DG-S15S-3.5-4	1/11/2019	**1.7**	**8**	**74**	**0.5**	<0.039	**74**	**17**	**53**	**37**	**0.15**	<0.20	**81**	**1.1**	<0.16	**0.57**	**54**	**93**
DG-S15 (D)	3.5-4	DG-S15 (D)S-3.5-4	1/11/2019	**2.4**	**8.6**	**65**	**0.52**	<0.035	**71**	**16**	**59**	**29**	**0.075**	**0.54**	**77**	**1**	<0.14	<0.45	**57**	**80**
DG-S15	6-6.5	DG-S15S-6-6.5	1/11/2019	**0.96**	**12**	**660**	**0.64**	**0.14**	**30**	**7.1**	**6400**	**190**	**0.68**	**1.4**	**27**	**0.72**	**3**	**0.64**	**48**	**110**
DG-S16	0.5-1	DG-S16S-0.5-1	1/14/2019	**23**	**18**	**120**	**0.43**	**1.2**	**83**	**24**	**2800**	**4700**	**14**	**1.8**	**110**	**1.6**	**0.3**	**0.62**	**77**	**430**
DG-S16 (D)	0.5-1	DG-S16 (D)S-0.5-1	1/14/2019	**19**	**19**	**180**	**0.42**	**1.3**	**74**	**21**	**1800**	**3400**	**2.5**	**2.1**	**110**	**1.2**	<0.16	**0.72**	**67**	**450**
DG-S16	3.5-4	DG-S16S-3.5-4	1/14/2019	**7.3**	**20**	**840**	**1.4**	**0.68**	**71**	**16**	**230**	**1200**	**2.4**	**3.6**	**46**	**1.8**	**0.57**	**0.63**	**91**	**620**
DG-S17	0.5-1	DG-S17S-0.5-1	2/5/2019	**5**	**570**	**84**	**0.21**	**0.45**	**71**	**14**	**87**	**140**	**2.1**	<0.25	**85**	**2.9**	<0.19	**1.1**	**59**	**120**
DG-S17	3.5-4	DG-S17S-3.5-4	2/5/2019	**1.7**	**52**	**48**	**0.69**	<0.044	**33**	**15**	**30**	**13**	**0.14**	<0.23	**31**	**1.9**	<0.18	**0.63**	**44**	**92**
DG-S2	0.5-1	DG-S2S-0.5-1	12/13/2018	**9.5**	**290**	**74**	<0.10	**0.5**	**18**	**9.2**	**260**	**390**	**0.16**	**1.1**	**20**	**1.4**	**0.51**	**0.69**	**53**	**150**
DG-S2	3.5-4	DG-S2S-3.5-4	12/13/2018	<0.20	**2.7**	**66**	**0.45**	<0.030	**65**	**8.9**	**10**	**4.2**	**0.037**	**0.37**	**44**	**1.1**	<0.12	<0.45	**49**	**24**
DG-S3	0.5-1	DG-S3S-0.5-1	12/18/2018	**10**	**210**	**58**	<0.12	**0.98**	**12**	**12**	**170**	**290**	**0.11**	**0.63**	**24**	**0.99**	**0.24**	<0.35	**78**	**170**
DG-S3	3.5-4	DG-S3S-3.5-4	12/18/2018	**3.2**	**48**	**73**	**0.44**	**0.37**	**86**	**20**	**36**	**82**	**3.3**	**0.43**	**130**	**1.2**	<0.16	<0.53	**64**	**76**
DG-S4	0.5-1	DG-S4S-0.5-1	12/19/2018	**1.9**	**8.2**	**58**	<0.10	**0.73**	**29**	**8.5**	**100**	**130**	**0.048**	**1.6**	**28**	**1.7**	<0.16	<0.46	**44**	**130**
DG-S4	3.5-4	DG-S4S-3.5-4	12/19/2018	**17**	**320**	**620**	**1**	**1.4**	**35**	**11**	**460**	**2000**	**0.31**	**8.4**	**39**	<1.2	**3.6**	<0.45	**41**	**1100**
DG-S5	0.5-1	DG-S5S-0.5-1	12/18/2018	**7.3**	**140**	**170**	<0.13	**4**	**33**	**15**	**230**	**4200**	**0.15**	**2**	**29**	**1.3**	**9.2**	**1.2**	**100**	**1100**
DG-S5	3.5-4	DG-S5S-3.5-4	12/18/2018	**1.1**	**140**	**54**	**0.17**	**0.2**	**26**	**3.9**	**19**	**81**	**0.043**	**0.14**	**21**	<0.32	<0.11	<0.56	**19**	**140**
DG-S6	0.5-1	DG-S6S-0.5-1	12/19/2018	**8.9**	**23**	**300**	<0.27	**15**	**88**	**22**	**580**	**660**	**0.25**	**7.8**	**93**	**1.7**	**1.5**	<0.31	**120**	**780**
DG-S6	3.5-4	DG-S6S-3.5-4	12/19/2018	**9.4**	**11**	**360**	**0.14**	**0.39**	**14**	**4.1**	**260**	**1500**	**0.19**	**0.33**	**15**	**0.99**	**2.3**	<1.2	**11**	**620**
DG-S7	0.5-1	DG-S7S-0.5-1	1/8/2019	**3.3**	**8.8**	**150**	<0.075	**0.98**	**31**	**10**	**160**	**200**	**0.26**	**1.6**	**27**	**2.8**	**0.22**	**0.8**	**57**	**280**
DG-S7	3.5-4	DG-S7S-3.5-4	1/8/2019	**22**	**26**	**1200**	<0.20	**2.2**	**75**	**9.1**	**2200**	**3600**	**0.23**	**0.7**	**40**	**5.9**	**4.6**	**0.33**	**23**	**3600**
DG-S8	0.5-1	DG-S8S-0.5-1	1/29/2019	<0.27	**0.51**	**32**	**0.23**	<0.040	**13**	**8.3**	**110**	**12**	**0.17**	**0.33**	**4.1**	<0.48	<0.16	<0.91	**75**	**36**
DG-S8 (D)	0.5-1	DG-S8 (D)S-0.5-1	1/29/2019	<0.31	**0.64**	**33**	**0.17**	<0.046	**12**	**8.2**	**120**	**15**	**0.11**	<0.24	**3.9**	<0.56	<0.19	<0.46	**70**	**38**

Table 2: Metals Concentrations in Soil
UPC OU-2
Brisbane, California

Sample Location	Depth Range (ft bgs)	Sample Name	Collection Date	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
Direct Exposure Human Health Risk Level Residential Soil Exposure ESL [1]				1.1E+01	6.7E-02	1.5E+04	1.6E+01	7.8E+01	1.2E+05	2.3E+01	3.1E+03	8.0E+01	1.3E+01	3.9E+02	8.2E+02	3.9E+02	3.9E+02	7.8E-01	3.9E+02	2.3E+04
Regional Background [2]				5.5E+00	1.9E+01	3.2E+02	1.0E+00	2.7E+00	1.0E+02	2.5E+01	6.9E+01	1.6E+01	4.0E-01	7.4E+00	1.2E+02	5.6E+00	1.8E+00	7.6E+00	7.4E+01	1.1E+02
Units				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
DG-S8	3.5-4	DG-S8S-3.5-4	1/29/2019	**0.76**	**3.7**	**30**	**0.19**	<0.034	**7.2**	**13**	**91**	**33**	**0.059**	**0.18**	**4.9**	**0.65**	**0.2**	<0.54	**81**	**54**
DG-S9	0.5-1	DG-S9S-0.5-1	12/20/2018	**1.8**	**3.3**	**67**	<0.10	**0.4**	**15**	**11**	**92**	**98**	**0.064**	**0.28**	**13**	<0.48	<0.16	<0.40	**74**	**130**
DG-S9	3.5-4	DG-S9S-3.5-4	12/20/2018	<0.26	**1**	**42**	<0.10	<0.039	**7.4**	**10**	**140**	**4**	**0.043**	<0.20	**9.7**	**0.81**	<0.16	<0.46	**88**	**38**
DG-S9	4.5-5	DG-S9S-4.5-5	12/20/2018	**6.2**	**110**	**100**	**0.16**	**26**	**29**	**9.4**	**210**	**500**	**0.12**	<0.24	**36**	<0.57	<0.19	<0.46	**53**	**4500**
DG-T1	0.5-1	DG-T1S-0.5-1	12/17/2018	**2**	**100**	**73**	**0.13**	**0.84**	**29**	**12**	**84**	**140**	**0.54**	**0.85**	**43**	**0.73**	**0.17**	<0.55	**73**	**190**
DG-T1	3.5-4	DG-T1S-3.5-4	12/17/2018	**1.4**	**24**	**70**	**0.18**	<0.030	**76**	**12**	**24**	**2.8**	**0.45**	<0.16	**89**	<0.37	<0.12	<0.43	**48**	**42**
DG-T1 (D)	3.5-4	DG-T1 (D)S-3.5-4	12/17/2018	**3.5**	**27**	**110**	**0.28**	**0.33**	**100**	**18**	**28**	**6.3**	**0.59**	**0.45**	**130**	**0.43**	<0.14	<0.36	**70**	**57**
DG-T10	0.5-1	DG-T10S-0.5-1	1/14/2019	**0.52**	**32**	**61**	**0.21**	<0.039	**14**	**13**	**190**	**44**	**0.039**	**0.45**	**11**	**0.99**	<0.16	<0.41	**120**	**50**
DG-T10	3.5-4	DG-T10S-3.5-4	1/14/2019	**1.2**	**110**	**79**	**0.7**	**0.18**	**120**	**20**	**67**	**27**	**0.71**	**0.6**	**150**	**1.7**	<0.10	<0.46	**56**	**84**
DG-T11	0.5-1	DG-T11S-0.5-1	12/21/2018	**2.2**	**4.8**	**49**	**0.33**	**0.88**	**25**	**5.1**	**150**	**4600**	**0.3**	**0.86**	**17**	<0.57	<0.19	<0.29	**28**	**270**
DG-T11	3.5-4	DG-T11S-3.5-4	12/21/2018	**8.1**	**4.3**	**43**	**0.65**	**0.55**	**36**	**7.7**	**1000**	**550**	**0.37**	**0.64**	**24**	<0.36	<0.12	<0.55	**55**	**130**
DG-T12	0.5-1	DG-T12S-0.5-1	1/14/2019	**33**	**9.3**	**220**	**0.24**	**1.5**	**52**	**9.6**	**4600**	**1100**	**0.3**	**2.7**	**69**	**1.6**	**3.1**	<0.35	**53**	**550**
DG-T12	3.5-4	DG-T12S-3.5-4	1/14/2019	**1.2**	**8.1**	**160**	**0.47**	**0.45**	**95**	**15**	**150**	**91**	**2.5**	**0.85**	**130**	<0.58	<0.20	<0.56	**64**	**420**
DG-T13	0.5-1	DG-T13S-0.5-1	1/10/2019	**4.9**	**4.3**	**80**	**0.23**	**0.25**	**20**	**11**	**430**	**410**	**0.21**	**1.4**	**26**	**1.4**	<0.11	<0.56	**87**	**110**
DG-T13 (D)	0.5-1	DG-T13 (D)S-0.5-1	1/10/2019	**15**	**19**	**120**	<0.30	**1.3**	**60**	**25**	**1300**	**2500**	**0.56**	**6.8**	**130**	<1.4	<0.47	<0.33	**66**	**310**
DG-T13	3.5-4	DG-T13S-3.5-4	1/10/2019	**0.7**	**2.9**	**71**	**0.12**	<0.034	**71**	**7.9**	**12**	**6.3**	**0.2**	**0.18**	**50**	**1**	<0.14	<1.3	**46**	**25**
DG-T14	0.5-1	DG-T14S-0.5-1	1/14/2019	**2.5**	**3.8**	**110**	**0.22**	**0.67**	**200**	**25**	**64**	**210**	**0.25**	**0.39**	**400**	**0.48**	<0.11	**0.65**	**40**	**360**
DG-T14	3.5-4	DG-T14S-3.5-4	1/14/2019	**4.5**	**2.2**	**71**	**0.12**	**0.99**	**360**	**34**	**85**	**170**	**0.28**	**0.16**	**650**	**1.1**	<0.12	**0.49**	**38**	**160**
DG-T15	0.5-1	DG-T15S-0.5-1	12/21/2018	**2.6**	**0.36**	**45**	**0.38**	**0.29**	**380**	**33**	**25**	**61**	**2.4**	**0.42**	**530**	<0.52	<0.18	**0.75**	**38**	**48**
DG-T15	3.5-4	DG-T15S-3.5-4	12/21/2018	**1.7**	<0.28	**49**	**0.5**	**0.2**	**490**	**53**	**30**	**5.6**	**0.054**	**0.53**	**880**	**0.75**	<0.17	<0.50	**54**	**52**
DG-T16	0.5-1	DG-T16S-0.5-1	1/24/2019	**4.7**	**14**	**32**	<0.12	**0.65**	**35**	**8.9**	**140**	**280**	**0.15**	**0.39**	**24**	**1.1**	<0.19	<0.48	**44**	**63**
DG-T16	3.5-4	DG-T16S-3.5-4	1/24/2019	**0.34**	**0.9**	**35**	<0.11	**0.04**	**20**	**7.1**	**48**	**18**	**0.058**	<0.21	**11**	<0.49	<0.16	<0.55	**51**	**25**
DG-T17	0.5-1	DG-T17S-0.5-1	1/28/2019	**1.2**	**4.2**	**140**	<0.49	**0.57**	**27**	**5.9**	**55**	**110**	**0.073**	<0.96	**26**	**2.6**	<0.75	<0.47	**34**	**110**
DG-T17	3.5-4	DG-T17S-3.5-4	1/28/2019	**0.81**	**23**	**68**	<0.13	**0.39**	**13**	**9**	**120**	**95**	**0.091**	**0.37**	**11**	**1.2**	<0.19	**13**	**99**	**71**
DG-T17	7-7.5	DG-T17S-7-7.5	1/28/2019	**2.3**	**12**	**400**	**0.9**	**2.1**	**34**	**8.2**	**2300**	**3300**	**1.2**	**1.3**	**26**	<0.53	**2.4**	**39**	**52**	**1000**
DG-T17 (D)	7-7.5	DG-T17 (D)S-7-7.5	1/28/2019	**1.1**	**14**	**540**	**1.6**	**2.3**	**21**	**8.8**	**89**	**1600**	**0.86**	**1.1**	**23**	<0.39	**0.51**	**20**	**51**	**450**
DG-T2	0.5-1	DG-T2S-0.5-1	2/5/2019	**0.47**	**0.72**	**36**	**0.14**	<0.042	**45**	**5.3**	**5.6**	**3**	**0.16**	<0.22	**33**	**0.89**	<0.17	<0.38	**28**	**17**
DG-T2	3.5-4	DG-T2S-3.5-4	12/13/2018	**0.53**	**3.5**	**130**	**0.12**	**0.03**	**100**	**35**	**11**	**4.4**	**0.031**	**0.6**	**83**	**1.2**	<0.10	**0.74**	**70**	**28**
DG-T3	0.5-1	DG-T3S-0.5-1	12/14/2018	**3.6**	**120**	**71**	<0.096	**0.85**	**30**	**9.9**	**110**	**190**	**0.14**	**1.6**	**29**	**0.47**	<0.15	<0.30	**54**	**210**
DG-T3	3.5-4	DG-T3S-3.5-4	12/14/2018	**1.5**	**120**	**150**	**0.26**	<0.032	**86**	**22**	**99**	**44**	**1.8**	**1.2**	**130**	**1.2**	<0.13	<0.43	**71**	**73**
DG-T4	0.5-1	DG-T4S-0.5-1	12/19/2018	**5.5**	**15**	**64**	**0.37**	**1.6**	**30**	**11**	**1300**	**280**	**0.25**	**2**	**30**	**1.8**	**3.4**	<0.37	**76**	**370**
DG-T4	3.5-4	DG-T4S-3.5-4	12/19/2018	**2.6**	**16**	**120**	**0.68**	**0.18**	**56**	**54**	**46**	**280**	**0.09**	**1.4**	**45**	**1.5**	<0.20	<0.53	**60**	**170**
DG-T5	0.5-1	DG-T5S-0.5-1	1/8/2019	**0.68**	**20**	**41**	<0.071	**0.057**	**6.7**	**8.7**	**89**	**150**	**0.13**	<0.14	**3.8**	**0.77**	**0.45**	<0.57	**77**	**72**
DG-T5	3.5-4	DG-T5S-3.5-4	1/8/2019	**1.2**	**24**	**46**	**0.22**	**0.12**	**29**	**4.6**	**15**	**14**	**0.037**	**0.15**	**21**	**1**	<0.11	<0.32	**21**	**40**
DG-T6	0.5-1	DG-T6S-0.5-1	12/19/2018	**0.85**	**5.4**	**71**	<0.10	**0.15**	**22**	**9.1**	**110**	**77**	**0.1**	**0.48**	**22**	<0.47	<0.16	<0.32	**72**	**82**
DG-T6	3.5-4	DG-T6S-3.5-4	12/19/2018	**32**	**33**	**1600**	**0.61**	**5.7**	**46**	**7.7**	**900**	**4200**	**0.38**	**1.6**	**42**	<1.2	**8.4**	<0.45	**36**	**3700**
DG-T7	3.5-4	DG-T7S-3.5-4	12/19/2018	**2.7**	**6.5**	**220**	**0.17**	**0.57**	**21**	**6.3**	**86**	**420**	**0.14**	**0.72**	**21**	<0.45	**0.78**	<1.2	**34**	**390**
DG-T7 (D)	3.5-4	DG-T7 (D)S-3.5-4	12/19/2018	**2.7**	**7**	**250**	<0.12	**0.49**	**21**	**6.1**	**220**	**750**	**0.076**	**0.68**	**21**	<0.55	**0.29**	<0.44	**34**	**440**
DG-T8	0.5-1	DG-T8S-0.5-1	1/15/2019	**0.47**	**2.7**	**98**	**0.79**	**5.3**	**21**	**10**	**500**	**78**	**0.13**	**1**	**26**	**1.1**	<0.11	<0.53	**85**	**1400**
DG-T8	3.5-4	DG-T8S-3.5-4	1/15/2019	**13**	**28**	**200**	**0.82**	**0.53**	**31**	**17**	**470**	**990**	**0.23**	**2.3**	**69**	**4.1**	**0.42**	**0.39**	**94**	**670**
DG-T9	0.5-1	DG-T9S-0.5-1	1/10/2019	<0.27	**0.66**	**27**	<0.11	**0.12**	**8.6**	**12**	**110**	**20**	**0.054**	**0.22**	**4.4**	**0.78**	<0.16	**0.93**	**100**	**76**
DG-T9	3.5-4	DG-T9S-3.5-4	1/10/2019	<0.28	<0.29	**20**	<0.11	<0.042	**7.8**	**7.1**	**81**	**2.2**	**0.038**	<0.22	**2.3**	<0.51	<0.17	**1.4**	**74**	**20**
DG-U1	0.5-1	DG-U1S-0.5-1	12/13/2018	**2**	**97**	**98**	**0.12**	**0.041**	**76**	**12**	**48**	**28**	**1.2**	<0.21	**83**	<0.49	**0.22**	**1**	**41**	**71**
DG-U1	3.5-4	DG-U1S-3.5-4	12/13/2018	**2.5**	**34**	**130**	**0.51**	**0.037**	**110**	**21**	**38**	**6.4**	**0.46**	<0.18	**130**	<0.43	<0.15	<0.47	**66**	**71**
DG-U10	0.5-1	DG-U10S-0.5-1	1/14/2019	**2.4**	**2.3**	**43**	**0.19**	**0.25**	**17**	**14**	**220**	**170**	**0.075**	**1.1**	**13**	**2.2**	<0.18	<0.42	**110**	**130**
DG-U10	3.5-4	DG-U10S-3.5-4	1/14/2019	**30**	**32**	**150**	**0.31**	**0.76**	**27**	**10**	**1400**	**1500**	**0.15**	**1.5**	**62**	**2.1**	**0.5**	<0.52	**94**	**320**
DG-U11	0.5-1	DG-U11S-0.5-1	1/10/2019	**34**	**11**	**68**	<0.10	**0.2**	**17**	**8.8**	**150**	**840**	**0.12**	<0.20	**12**	<0.46	<0.16	<0.44	**65**	**120**
DG-U11	3.5-4	DG-U11S-3.5-4	1/10/2019	**1.6**	**8.7**	**130**	**0.61**	**0.46**	**35**	**11**	**34**	**94**	**0.16**	<0.22	**53**	**0.89**	<0.17	**1.3**	**39**	**290**
DG-U12	0.5-1	DG-U12S-0.5-1	1/28/2019	**1.7**	**3.3**	**31**	<0.10	**0.26**	**10**	**8.2**	**110**	**110**	**0.093**	<0.20	**10**	**0.72**	<0.16	**1.1**	**76**	**80**
DG-U12	3.5-4	DG-U12S-3.5-4	1/28/2019	**8.4**	**59**	**44**	**1.3**	**3.4**	**73**	**19**	**110**	**1700**	**6.3**	**1.2**	**58**	**3.7**	<0.40	<0.46	**31**	**790**
DG-U12 (D)	3.5-4	DG-U12 (D)S-3.5-4	1/28/2019	**12**	**13**	**74**	**1**	**3.7**	**210**	**15**	**68**	**20000**	**8.9**	**1.1**	**48**	**2.8**	<0.19	<1.2	**39**	**990**
DG-U13	0.5-1	DG-U13S-0.5-1	12/21/2018	**0.87**	**2.8**	**140**	**0.62**	**0.27**	**120**	**35**	**22**	**63**	**0.24**	**0.38**	**240**	**0.71**	<0.13	<0.53	**41**	**62**

Table 2: Metals Concentrations in Soil
UPC OU-2
Brisbane, California

Sample Location	Depth Range (ft bgs)	Sample Name	Collection Date	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
Direct Exposure Human Health Risk Level Residential Soil Exposure ESL [1]				1.1E+01	6.7E-02	1.5E+04	1.6E+01	7.8E+01	1.2E+05	2.3E+01	3.1E+03	8.0E+01	1.3E+01	3.9E+02	8.2E+02	3.9E+02	3.9E+02	7.8E-01	3.9E+02	2.3E+04
Regional Background [2]				5.5E+00	1.9E+01	3.2E+02	1.0E+00	2.7E+00	1.0E+02	2.5E+01	6.9E+01	1.6E+01	4.0E-01	7.4E+00	1.2E+02	5.6E+00	1.8E+00	7.6E+00	7.4E+01	1.1E+02
Units				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
DG-U13	3.5-4	DG-U13S-3.5-4	12/21/2018	**1.4**	<0.20	**39**	**0.72**	**0.14**	**1200**	**98**	**22**	**3.4**	**0.056**	**0.8**	**1700**	**2.2**	<0.12	<0.37	**45**	**31**
DG-U14	0.5-1	DG-U14S-0.5-1	1/24/2019	**0.57**	**2.4**	**28**	**0.21**	**0.062**	**18**	**6.5**	**19**	**21**	**0.045**	<0.21	**20**	**0.6**	<0.17	<0.34	**39**	**36**
DG-U14	3.5-4	DG-U14S-3.5-4	1/24/2019	**0.42**	**1.3**	**35**	**0.13**	**0.063**	**54**	**7.8**	**8.2**	**2.3**	**0.032**	<0.23	**22**	<0.53	<0.18	<0.48	**61**	**21**
DG-U14 (D)	3.5-4	DG-U14 (D)S-3.5-4	1/24/2019	**1.4**	**1.5**	**36**	<0.079	**0.29**	**51**	**6.5**	**8.4**	**1.6**	**0.021**	<0.16	**17**	<0.36	**0.15**	<0.51	**55**	**18**
DG-U15	3.5-4	DG-U15S-3.5-4	1/28/2019	**1.1**	**2.6**	**27**	<0.12	**0.17**	**14**	**12**	**100**	**24**	**0.058**	<0.23	**8.4**	<0.54	<0.18	<0.35	**84**	**54**
DG-U15	8.5-9	DG-U15S-8.5-9	1/28/2019	**1.6**	**7.1**	**55**	**0.43**	**0.18**	**28**	**13**	**26**	**8.1**	**0.11**	<0.23	**28**	**2.1**	<0.18	**34**	**37**	**47**
DG-U16	0.5-1	DG-U16S-0.5-1	1/24/2019	**1.4**	**2.6**	**32**	**0.21**	**0.24**	**12**	**13**	**150**	**120**	**0.092**	<0.21	**10**	**0.81**	<0.17	**14**	**95**	**71**
DG-U16	3.5-4	DG-U16S-3.5-4	1/24/2019	**0.41**	**0.73**	**65**	**0.21**	**0.2**	**67**	**17**	**17**	**6.3**	**0.05**	<0.15	**27**	<0.36	<0.12	<0.48	**120**	**49**
DG-U17	0.5-1	DG-U17S-0.5-1	1/24/2019	**4.8**	**11**	**190**	**0.22**	**1.2**	**35**	**6.7**	**69**	**4900**	**0.3**	**1**	**27**	**2**	<0.19	<0.35	**48**	**200**
DG-U17	0.5-1	DG-U17S-0.5-1	1/28/2019	**1.1**	**3.5**	**63**	**0.2**	**0.42**	**14**	**5.2**	**72**	**160**	**0.24**	**0.83**	**16**	<0.45	<0.15	<0.54	**35**	**280**
DG-U17	3.5-4	DG-U17S-3.5-4	1/24/2019	**4.6**	**4.4**	**150**	**0.5**	**0.45**	**180**	**24**	**41**	**13**	**18**	**0.3**	**210**	**1.9**	<0.12	<0.43	**79**	**65**
DG-U18	0.5-1	DG-U18S-0.5-1	1/24/2019	**1.6**	**38**	**78**	**0.44**	**0.73**	**60**	**12**	**52**	**130**	**0.32**	**0.56**	**56**	**0.65**	<0.15	<0.35	**59**	**150**
DG-U18	3.5-4	DG-U18S-3.5-4	1/24/2019	**1.9**	**98**	**72**	**0.45**	**0.42**	**68**	**14**	**32**	**35**	**0.43**	<0.20	**53**	**0.98**	<0.15	<0.44	**54**	**130**
DG-U2	0.5-1	DG-U2S-0.5-1	12/13/2018	**28**	**17**	**110**	<0.13	**1.2**	**35**	**11**	**190**	**2200**	**0.56**	**3.7**	**51**	**1.3**	<0.20	<0.44	**58**	**240**
DG-U2	3.5-4	DG-U2S-3.5-4	2/5/2019	**3.2**	**4.4**	**120**	**0.45**	<0.031	**120**	**18**	**28**	**4.8**	**10**	<0.16	**180**	**1.5**	<0.13	<0.57	**60**	**49**
DG-U3	0.5-1	DG-U3S-0.5-1	12/18/2018	**3**	**200**	**99**	**0.17**	**2**	**25**	**11**	**200**	**1600**	**0.3**	**1.4**	**31**	**1.2**	**0.58**	**0.62**	**60**	**420**
DG-U3	3.5-4	DG-U3S-3.5-4	12/18/2018	**1.2**	**65**	**36**	**0.92**	**0.3**	**32**	**15**	**49**	**12**	**0.11**	**0.61**	**40**	**0.6**	<0.12	<0.53	**35**	**90**
DG-U3 (D)	3.5-4	DG-U3 (D)S-3.5-4	12/18/2018	**3.3**	**84**	**64**	**0.46**	**0.35**	**79**	**19**	**34**	**25**	**0.47**	**0.59**	**100**	<0.50	<0.17	<0.33	**53**	**69**
DG-U4	0.5-1	DG-U4S-0.5-1	12/18/2018	**5.2**	**37**	**180**	<0.098	**2.7**	**37**	**11**	**170**	**320**	**0.4**	**4**	**130**	**0.83**	**0.45**	<0.48	**75**	**510**
DG-U4 (D)	0.5-1	DG-U4 (D)S-0.5-1	12/18/2018	**4**	**120**	**160**	<0.13	**2.8**	**43**	**12**	**280**	**470**	**0.51**	**3.1**	**42**	**1.1**	**0.37**	<0.44	**83**	**730**
DG-U4	3.5-4	DG-U4S-3.5-4	12/18/2018	<0.33	**35**	**36**	**0.14**	**0.066**	**12**	**9.2**	**47**	**5**	**0.034**	**0.39**	**11**	**0.85**	<0.20	<0.56	**54**	**38**
DG-U5	0.5-1	DG-U5S-0.5-1	12/18/2018	**3.5**	**40**	**120**	<0.092	**2.5**	**39**	**12**	**230**	**430**	**0.16**	**4.1**	**25**	**0.97**	**0.37**	<0.57	**91**	**500**
DG-U5	3.5-4	DG-U5S-3.5-4	12/18/2018	**3**	**87**	**110**	**0.16**	**0.36**	**31**	**5.1**	**34**	**210**	**0.055**	**0.21**	**23**	<0.46	**0.17**	<0.41	**27**	**330**
DG-U6	0.5-1	DG-U6S-0.5-1	12/19/2018	**1.1**	**2.6**	**53**	<0.094	**0.22**	**17**	**8.7**	**140**	**400**	**0.049**	**0.31**	**8.3**	**0.55**	**0.19**	<0.45	**66**	**93**
DG-U6	3.5-4	DG-U6S-3.5-4	12/19/2018	**40**	**60**	**2000**	**0.3**	**5.1**	**49**	**18**	**780**	**6700**	**0.66**	**3**	**87**	<2.2	**3.4**	<0.42	**23**	**2200**
DG-U7	0.5-1	DG-U7S-0.5-1	1/8/2019	**0.75**	**5.1**	**72**	<0.096	**0.94**	**19**	**8.8**	**110**	**69**	**0.073**	<0.19	**27**	**1**	<0.15	**2.2**	**69**	**490**
DG-U7	3.5-4	DG-U7S-3.5-4	1/8/2019	**12**	**18**	**930**	<0.20	**2.8**	**33**	**8.9**	**810**	**2600**	**0.42**	**0.55**	**40**	**4.8**	**6.7**	**0.66**	**40**	**1800**
DG-U8	0.5-1	DG-U8S-0.5-1	1/15/2019	**1.4**	**1.7**	**53**	**0.79**	**0.29**	**12**	**12**	**120**	**58**	**0.12**	**0.76**	**7.9**	**1.5**	<0.12	**1**	**99**	**110**
DG-U8	3.5-4	DG-U8S-3.5-4	1/15/2019	**20**	**27**	**1500**	**0.76**	**5.3**	**78**	**7.7**	**1600**	**5300**	**0.49**	**2.5**	**86**	**4.7**	**8.6**	**0.86**	**32**	**4200**
DG-U9	0.5-1	DG-U9S-0.5-1	12/20/2018	**5.4**	**9.3**	**110**	**0.26**	**1.9**	**57**	**11**	**350**	**510**	**0.24**	**2.3**	**27**	<0.53	<0.18	<0.80	**72**	**740**
DG-U9	3.5-4	DG-U9S-3.5-4	12/20/2018	**13**	**8.9**	**440**	**0.38**	**2.5**	**23**	**10**	**460**	**1400**	**0.38**	**1.7**	**21**	<0.95	**0.34**	<0.51	**67**	**720**
DG-U9 (D)	3.5-4	DG-U9 (D)S-3.5-4	12/20/2018	**10**	**10**	**430**	<0.10	**1.7**	**22**	**11**	**450**	**1300**	**0.27**	**0.3**	**43**	**0.72**	**0.75**	<0.92	**69**	**930**
DG-V1	0.5-1	DG-V1S-0.5-1	12/17/2018	**2.1**	**200**	**67**	<0.084	**0.39**	**74**	**15**	**61**	**51**	**1.9**	**0.17**	**80**	<0.39	<0.13	<0.45	**67**	**99**
DG-V1	3.5-4	DG-V1S-3.5-4	12/17/2018	**1.7**	**18**	**75**	**0.27**	<0.038	**120**	**18**	**26**	**3.5**	**0.31**	<0.20	**140**	<0.46	<0.16	<0.37	**52**	**51**
DG-V10	0.5-1	DG-V10S-0.5-1	1/14/2019	**1**	**3**	**58**	**0.22**	**0.52**	**16**	**11**	**170**	**93**	**0.1**	**1.4**	**11**	**1.5**	<0.17	<0.45	**110**	**190**
DG-V10	3.5-4	DG-V10S-3.5-4	1/14/2019	**12**	**22**	**84**	**0.36**	**0.6**	**22**	**13**	**590**	**950**	**0.17**	**3.3**	**94**	**3.7**	<0.28	<0.48	**74**	**170**
DG-V11	0.5-1	DG-V11S-0.5-1	12/21/2018	**1.9**	**29**	**70**	**1.1**	**0.31**	**16**	**8.9**	**120**	**180**	**0.11**	**0.42**	**11**	<0.34	<0.11	<0.81	**85**	**94**
DG-V11	3.5-4	DG-V11S-3.5-4	12/21/2018	**10**	**15**	**570**	**1.1**	**1.3**	**54**	**8.9**	**210**	**1800**	**0.056**	**1.2**	**37**	<0.35	**2.2**	<0.33	**48**	**780**
DG-V12	0.5-1	DG-V12S-0.5-1	1/28/2019	**1**	**1.5**	**30**	<0.12	**0.15**	**10**	**11**	**110**	**63**	**0.076**	<0.23	**10**	**2.2**	<0.18	<0.34	**72**	**55**
DG-V12	3.5-4	DG-V12S-3.5-4	1/28/2019	<0.30	**5.2**	**70**	**0.33**	**0.12**	**54**	**15**	**30**	**7.4**	**0.031**	<0.23	**33**	**1.1**	<0.18	<0.52	**52**	**47**
DG-V13	0.5-1	DG-V13S-0.5-1	1/10/2019	**4.2**	**7.1**	**66**	**0.25**	**0.36**	**36**	**8.7**	**120**	**360**	**0.097**	**0.76**	**33**	**0.59**	<0.16	<0.53	**64**	**230**
DG-V13	3.5-4	DG-V13S-3.5-4	1/10/2019	**2.4**	**5.4**	**63**	**0.24**	**0.37**	**43**	**7.7**	**120**	**280**	**0.086**	**0.67**	**36**	**0.89**	**0.42**	<0.47	**64**	**120**
DG-V13	7.5-8	DG-V13S-7.5-8	1/10/2019	**1.8**	**6.2**	**100**	**0.66**	<0.041	**59**	**14**	**28**	**9.3**	**0.059**	**0.53**	**39**	**1.1**	<0.17	<0.40	**59**	**59**
DG-V14	0.5-1	DG-V14S-0.5-1	1/23/2019	<5.0	**3.9**	**45**	<0.25	**0.51**	**20**	**9.9**	**120**	**390**	**0.2**	<1.0	**35**	<1.7	<0.89	<0.48	**77**	**190**
DG-V14	3.5-4	DG-V14S-3.5-4	1/23/2019	<5.0	**7.2**	**49**	**0.56**	<0.25	**38**	**10**	**42**	**6.4**	**0.027**	<0.99	**31**	<1.7	<0.88	<5.0	**56**	**47**
DG-V15	0.5-1	DG-V15S-0.5-1	1/23/2019	**5.4**	**11**	**120**	**0.28**	**1.1**	**38**	**11**	**270**	**1800**	**0.037**	**1.1**	**77**	<1.7	<0.89	<5.0	**78**	**540**
DG-V15	3.5-4	DG-V15S-3.5-4	1/23/2019	<5.0	**1.6**	**65**	**0.63**	**0.32**	**87**	**24**	**31**	**2.7**	**0.031**	<0.99	**39**	<1.7	<0.88	<5.0	**170**	**52**
DG-V16	0.5-1	DG-V16S-0.5-1	1/24/2019	**1.4**	**1.5**	**35**	**0.27**	**0.29**	**12**	**8.9**	**110**	**71**	**0.086**	**0.29**	**12**	<0.55	<0.19	<5.0	**74**	**56**
DG-V17	0.5-1	DG-V17S-0.5-1	1/28/2019	**4.6**	**11**	**89**	<0.11	**2.9**	**24**	**12**	**140**	**640**	**0.1**	**0.23**	**26**	**3.2**	<0.17	<0.53	**77**	**2300**
DG-V17	3.5-4	DG-V17S-3.5-4	1/28/2019	**1.9**	**3.3**	**64**	<0.13	**0.27**	**33**	**18**	**47**	**14**	**0.028**	<0.26	**21**	**1.2**	<0.20	**30**	**81**	**62**
DG-V17 (D)	3.5-4	DG-V17 (D)S-3.5-4	1/28/2019	**1.5**	**4.8**	**70**	**0.16**	**0.29**	**37**	**17**	**49**	**34**	**0.048**	<0.21	**24**	**1.2**	<0.17	**32**	**69**	**120**
DG-V17	9.5-10	DG-V17S-9.5-10	1/28/2019	**6.7**	**13**	**460**	**0.49**	**2**	**37**	**11**	**440**	**4900**	**1**	**1.5**	**39**	**2.4**	**2.9**	**27**	**50**	**2100**

Table 2: Metals Concentrations in Soil
UPC OU-2
Brisbane, California

Sample Location	Depth Range (ft bgs)	Sample Name	Collection Date	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
Direct Exposure Human Health Risk Level Residential Soil Exposure ESL [1]				1.1E+01	6.7E-02	1.5E+04	1.6E+01	7.8E+01	1.2E+05	2.3E+01	3.1E+03	8.0E+01	1.3E+01	3.9E+02	8.2E+02	3.9E+02	3.9E+02	7.8E-01	3.9E+02	2.3E+04
Regional Background [2]				5.5E+00	1.9E+01	3.2E+02	1.0E+00	2.7E+00	1.0E+02	2.5E+01	6.9E+01	1.6E+01	4.0E-01	7.4E+00	1.2E+02	5.6E+00	1.8E+00	7.6E+00	7.4E+01	1.1E+02
Units				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
DG-V18	0.5-1	DG-V18S-0.5-1	1/24/2019	**0.38**	**2.4**	**52**	<0.078	**0.16**	**9.7**	**5.6**	**29**	**22**	**0.073**	<0.15	**15**	**0.59**	<0.12	**19**	**39**	**40**
DG-V18	3.5-4	DG-V18S-3.5-4	1/24/2019	**0.55**	**34**	**33**	**0.075**	**0.087**	**8.7**	**9.5**	**97**	**1.2**	**0.049**	<0.14	**2.8**	<0.33	<0.11	<0.35	**92**	**32**
DG-V2 (D)	0.5-1	DG-V2 (D)S-0.5-1	12/13/2018	**3**	**16**	**70**	**0.15**	**0.61**	**23**	**11**	**120**	**180**	**0.17**	**1.5**	**33**	**1.3**	<0.19	<0.32	**72**	**150**
DG-V2	3.5-4	DG-V2S-3.5-4	12/13/2018	**1.9**	**58**	**41**	**0.67**	**0.16**	**32**	**19**	**39**	**17**	**0.21**	**0.77**	**40**	**1.2**	<0.19	<0.55	**39**	**87**
DG-V2	3.5-4	DG-V2S-3.5-4	2/5/2019	**3.8**	**16**	**70**	**0.29**	**0.12**	**190**	**16**	**27**	**8.2**	**5.1**	<0.20	**170**	**0.94**	<0.16	<0.56	**63**	**120**
DG-V3	0.5-1	DG-V3S-0.5-1	12/14/2018	**3.8**	**330**	**79**	**0.32**	**0.7**	**29**	**13**	**210**	**280**	**0.11**	**0.97**	**25**	**1.9**	<0.18	**24**	**91**	**240**
DG-V3	3.5-4	DG-V3S-3.5-4	12/14/2018	**2.3**	**140**	**49**	**0.88**	**0.14**	**34**	**22**	**47**	**18**	**0.091**	**1.1**	**41**	**1.3**	<0.13	<0.51	**42**	**92**
DG-V4	0.5-1	DG-V4S-0.5-1	12/18/2018	**1.1**	**69**	**53**	<0.099	<0.038	**14**	**8.6**	**87**	**40**	**0.14**	**0.23**	**23**	**0.97**	<0.15	<0.36	**55**	**54**
DG-V4	3.5-4	DG-V4S-3.5-4	12/18/2018	**1.6**	**130**	**150**	**0.24**	<0.047	**43**	**10**	**28**	**22**	**0.085**	**0.26**	**96**	<0.57	<0.19	<0.44	**31**	**64**
DG-V5	0.5-1	DG-V5S-0.5-1	1/8/2019	**3.4**	**98**	**100**	**0.15**	**1.2**	**22**	**13**	**140**	**580**	**0.16**	**0.91**	**35**	**2.5**	**1.3**	<0.55	**62**	**320**
DG-V5	3.5-4	DG-V5S-3.5-4	1/8/2019	**4.2**	**120**	**88**	**0.18**	**0.058**	**56**	**7.1**	**28**	**86**	**0.029**	<0.14	**37**	**1.1**	**0.12**	**0.4**	**42**	**110**
DG-V5	7.5-8	DG-V5S-7.5-8	1/8/2019	**2.1**	**12**	**97**	**0.6**	<0.047	**42**	**10**	**41**	**5.9**	**0.023**	<0.24	**36**	**2**	<0.19	<0.32	**53**	**56**
DG-V6	0.5-1	DG-V6S-0.5-1	12/19/2018	**3.5**	**8.3**	**110**	<0.098	**1.1**	**28**	**8.9**	**140**	**350**	**0.27**	**1.1**	**43**	**0.82**	**0.21**	<0.55	**37**	**250**
DG-V6	3.5-4	DG-V6S-3.5-4	12/19/2018	**2.5**	**9.3**	**200**	**0.74**	**0.47**	**35**	**10**	**140**	**270**	**1.6**	<0.19	**37**	**0.76**	**0.92**	<0.44	**37**	**460**
DG-V6 (D)	3.5-4	DG-V6 (D)S-3.5-4	12/19/2018	**2.2**	**9.5**	**210**	**0.79**	**0.81**	**34**	**13**	**130**	**320**	**1.1**	<0.26	**38**	**0.97**	**0.34**	<0.43	**38**	**430**
DG-V7	0.5-1	DG-V7S-0.5-1	12/19/2018	**9.4**	**11**	**77**	**0.42**	<0.090	**42**	**13**	**130**	**810**	**0.12**	**3.3**	**37**	<1.1	**0.5**	<0.58	**52**	**220**
DG-V7	3.5-4	DG-V7S-3.5-4	12/19/2018	**5.3**	**6.6**	**240**	**0.087**	**0.67**	**23**	**6**	**220**	**680**	**0.075**	**1.1**	**26**	<0.38	**0.55**	<1.1	**31**	**480**
DG-V8	0.5-1	DG-V8S-0.5-1	1/15/2019	**46**	**31**	**1600**	**0.97**	**2.9**	**42**	**14**	**510**	**5500**	**0.77**	**4.1**	**42**	**6**	**12**	<0.36	**29**	**1600**
DG-V8	3.5-4	DG-V8S-3.5-4	1/15/2019	**4.7**	**12**	**310**	**0.99**	**1.2**	**59**	**9.9**	**120**	**770**	**0.31**	**1.5**	**40**	**2.4**	**0.8**	**2.1**	**53**	**640**
DG-V9	0.5-1	DG-V9S-0.5-1	1/10/2019	<0.21	<0.21	**43**	<0.082	**0.091**	**7.2**	**9.4**	**91**	**14**	**0.075**	**0.28**	**3.3**	**0.54**	<0.13	<0.48	**70**	**41**
DG-V9	3.5-4	DG-V9S-3.5-4	1/10/2019	**6.7**	**5.5**	**420**	**0.1**	**1.7**	**12**	**3.2**	**430**	**2400**	**0.53**	**0.2**	**54**	**1.7**	**1.8**	**1.3**	**8.6**	**1600**
DG-V9	7.5-8	DG-V9S-7.5-8	1/10/2019	**0.79**	**7.5**	**120**	**0.52**	<0.025	**41**	**13**	**34**	**14**	**0.063**	**0.14**	**29**	**1.3**	<0.10	**0.63**	**48**	**53**
DG-W1	0.5-1	DG-W1S-0.5-1	12/13/2018	**3.4**	**330**	**140**	**0.15**	**0.45**	**85**	**16**	**94**	**110**	**3.1**	<0.23	**120**	<0.55	**0.29**	**0.34**	**78**	**120**
DG-W1	3.5-4	DG-W1S-3.5-4	12/13/2018	**2.7**	**15**	**120**	**0.2**	<0.043	**95**	**14**	**27**	**3.4**	**0.51**	<0.22	**110**	<0.52	<0.17	<0.53	**62**	**49**
DG-W1	9-10	DG-W1S-9-10	12/13/2018	**1.5**	**49**	**46**	**0.78**	<0.033	**37**	**16**	**42**	**9.4**	**0.057**	**0.17**	**40**	<0.40	<0.13	<0.50	**45**	**92**
DG-W10	0.5-1	DG-W10S-0.5-1	1/29/2019	**12**	**5.5**	**760**	<0.46	**4.4**	**54**	**35**	**700**	**1300**	**0.26**	**1.2**	**30**	<2.1	**2**	<0.39	**280**	**980**
DG-W10	3.5-4	DG-W10S-3.5-4	1/29/2019	**77**	**25**	**1000**	<0.26	**5.5**	**41**	**8.6**	**880**	**5600**	**2.3**	**0.85**	**54**	**2.2**	**12**	<0.41	**22**	**2800**
DG-W10 (D)	3.5-4	DG-W10 (D)S-3.5-4	1/29/2019	**30**	**17**	**1300**	**0.38**	**7.2**	**77**	**8.8**	**510**	**3100**	**1.9**	**1.1**	**51**	**6.1**	**13**	<1.2	**28**	**2100**
DG-W11	0.5-1	DG-W11S-0.5-1	1/29/2019	**10**	**50**	**29**	<0.10	**0.21**	**11**	**5**	**91**	**360**	**0.091**	**0.6**	**20**	**0.55**	<0.16	<1.3	**29**	**60**
DG-W11	3.5-4	DG-W11S-3.5-4	1/29/2019	**0.32**	**100**	**42**	**0.11**	<0.033	**46**	**7.2**	**5.4**	**1.7**	<0.0023	<0.17	**37**	**0.53**	<0.13	<0.46	**35**	**19**
DG-W11 (D)	3.5-4	DG-W11 (D)S-3.5-4	1/29/2019	**2.6**	**89**	**38**	<0.11	**0.11**	**50**	**5.9**	**7.2**	**5.3**	**0.0049**	<0.21	**37**	**0.57**	<0.17	<0.38	**29**	**21**
DG-W12	0.5-1	DG-W12S-0.5-1	1/28/2019	**1.9**	**2.3**	**33**	<0.13	**0.12**	**23**	**6.3**	**94**	**87**	**0.044**	<0.26	**12**	<0.60	<0.20	<0.48	**58**	**38**
DG-W12	3.5-4	DG-W12S-3.5-4	1/28/2019	<0.29	**7.5**	**600**	**0.71**	**0.14**	**17**	**19**	**20**	**19**	**0.062**	<0.22	**38**	**1.2**	<0.18	<0.58	**27**	**63**
DG-W13	0.5-1	DG-W13S-0.5-1	11/21/2018	**1.4**	**1.4**	**30**	<0.12	**0.17**	**16**	**13**	**130**	**66**	**0.07**	<0.24	**12**	<0.57	**0.7**	<0.50	**120**	**75**
DG-W13	0.5-1	DG-W13S-0.5-1	1/31/2019	**2**	**8.6**	**74**	**0.28**	**0.34**	**19**	**9.4**	**110**	**140**	**0.11**	<0.24	**22**	<0.56	<0.19	<0.55	**73**	**96**
DG-W13	3.5-4	DG-W13S-3.5-4	11/21/2018	**2.1**	**7.6**	**63**	**0.36**	**0.13**	**36**	**16**	**67**	**17**	**0.066**	**0.32**	**31**	<0.55	**0.72**	<0.54	**41**	**66**
DG-W13	3.5-4	DG-W13S-3.5-4	1/31/2019	**0.85**	**2.1**	**110**	**0.59**	**0.21**	**99**	**16**	**27**	**5.5**	**0.83**	<0.18	**130**	<0.43	<0.15	<0.53	**64**	**52**
DG-W13	7.5-8	DG-W13S-7.5-8	1/31/2019	**1.9**	**8.7**	**63**	**0.8**	**0.27**	**51**	**15**	**45**	**21**	**0.63**	<0.20	**52**	**1.3**	<0.16	<0.42	**44**	**96**
DG-W14	0.5-1	DG-W14S-0.5-1	1/23/2019	<5.0	**7.6**	**95**	<0.25	**2.7**	**36**	**7.3**	**170**	**420**	**0.56**	**2.4**	**30**	<1.7	<0.88	<0.45	**34**	**490**
DG-W14	3.5-4	DG-W14S-3.5-4	1/23/2019	<5.0	**6.2**	**56**	**0.4**	<0.25	**31**	**11**	**99**	**58**	**0.022**	<1.0	**74**	<1.7	<0.89	<5.0	**75**	**50**
DG-W14	9.5-10	DG-W14S-9.5-10	1/23/2019	<5.0	**14**	**29**	**0.35**	**0.44**	**40**	**11**	**37**	**18**	**0.079**	**1.1**	**51**	<1.7	<0.89	<5.0	**41**	**69**
DG-W15	0.5-1	DG-W15S-0.5-1	1/28/2019	**1.7**	**1.9**	**83**	<0.12	**0.21**	**26**	**10**	**37**	**23**	**0.25**	<0.24	**28**	<0.57	<0.19	<5.0	**57**	**58**
DG-W15 (D)	0.5-1	DG-W15 (D)S-0.5-1	1/28/2019	**1.2**	**5.6**	**85**	**0.11**	**0.061**	**30**	**11**	**36**	**13**	**0.0083**	<0.22	**40**	<0.53	<0.18	**22**	**58**	**53**
DG-W15	3.5-4	DG-W15S-3.5-4	1/28/2019	**1.2**	**3.9**	**57**	**0.14**	**0.13**	**13**	**4.3**	**80**	**110**	**0.047**	<0.24	**19**	<0.57	**0.2**	<0.51	**30**	**45**
DG-W17	0.5-1	DG-W17S-0.5-1	1/24/2019	**2.9**	**9.9**	**280**	**0.38**	**1.1**	**33**	**10**	**130**	**190**	**1.8**	**0.76**	**32**	**1.1**	**0.54**	**0.93**	**40**	**230**
DG-W17	3.5-4	DG-W17S-3.5-4	1/24/2019	<0.26	**0.71**	**16**	**0.15**	**0.11**	**11**	**10**	**59**	**8.4**	**0.092**	<0.20	**14**	**0.48**	<0.16	<0.57	**68**	**41**
DG-W17 (D)	3.5-4	DG-W17 (D)S-3.5-4	1/24/2019	**1.1**	**0.52**	**17**	<0.096	**0.5**	**10**	**17**	**110**	**2.3**	**0.19**	<0.19	**12**	**0.47**	**0.15**	<0.45	**96**	**52**
DG-W18	0.5-1	DG-W18S-0.5-1	1/24/2019	**1**	**4.8**	**65**	<0.11	**0.52**	**21**	**10**	**79**	**140**	**0.087**	**0.74**	**26**	<0.49	**0.21**	**1.4**	**64**	**88**
DG-W18 (D)	0.5-1	DG-W18 (D)S-0.5-1	1/24/2019	**0.73**	**2.9**	**64**	<0.11	**0.57**	**32**	**6.6**	**44**	**63**	**0.33**	**0.79**	**39**	<0.50	<0.17	**1**	**48**	**91**
DG-W18	3.5-4	DG-W18S-3.5-4	1/24/2019	**0.85**	**0.54**	**11**	<0.13	**0.43**	**14**	**17**	**120**	**4.4**	**0.025**	<0.25	**7**	<0.59	**0.23**	**0.89**	**110**	**55**
DG-W2	0.5-1	DG-W2S-0.5-1	12/14/2018	**6.6**	**33**	**96**	<0.12	**2.7**	**48**	**12**	**310**	**360**	**0.49**	**4.6**	**57**	**1.2**	**0.8**	**1.6**	**38**	**400**
DG-W2	3.5-4	DG-W2S-3.5-4	12/14/2018	**2.3**	**29**	**120**	**0.34**	<0.038	**97**	**20**	**48**	**17**	**0.49**	<0.20	**140**	<0.46	**0.43**	<0.55	**51**	**65**

Table 2: Metals Concentrations in Soil
UPC OU-2
Brisbane, California

Sample Location	Depth Range (ft bgs)	Sample Name	Collection Date	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
Direct Exposure Human Health Risk Level Residential Soil Exposure ESL [1]				1.1E+01	6.7E-02	1.5E+04	1.6E+01	7.8E+01	1.2E+05	2.3E+01	3.1E+03	8.0E+01	1.3E+01	3.9E+02	8.2E+02	3.9E+02	3.9E+02	7.8E-01	3.9E+02	2.3E+04
Regional Background [2]				5.5E+00	1.9E+01	3.2E+02	1.0E+00	2.7E+00	1.0E+02	2.5E+01	6.9E+01	1.6E+01	4.0E-01	7.4E+00	1.2E+02	5.6E+00	1.8E+00	7.6E+00	7.4E+01	1.1E+02
Units				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
DG-W2	8.5-9	DG-W2S-8.5-9	12/14/2018	**3.1**	**41**	**51**	**0.71**	**0.12**	**31**	**19**	**44**	**8.9**	**0.049**	**0.47**	**41**	**0.55**	**0.29**	<0.44	**35**	**74**
DG-W3	0.5-1	DG-W3S-0.5-1	12/18/2018	**3.7**	**140**	**34**	<0.090	**0.46**	**12**	**12**	**99**	**120**	**0.078**	**0.5**	**12**	**0.77**	**0.31**	<0.50	**66**	**92**
DG-W3	3.5-4	DG-W3S-3.5-4	12/18/2018	**1.6**	**140**	**86**	**0.99**	**0.44**	**30**	**32**	**55**	**21**	**0.12**	**0.89**	**48**	**0.73**	<0.18	<0.40	**37**	**97**
DG-W4	0.5-1	DG-W4S-0.5-1	12/18/2018	**0.3**	**34**	**32**	<0.071	<0.027	**7.1**	**7.1**	**65**	**3.9**	**0.059**	<0.14	**6.7**	<0.33	<0.11	**0.79**	**49**	**28**
DG-W4	3.5-4	DG-W4S-3.5-4	12/18/2018	**1.3**	**37**	**23**	**0.13**	**0.21**	**33**	**3.7**	**33**	**14**	**0.16**	<0.22	**22**	**1**	<0.17	<0.32	**26**	**77**
DG-W5	0.5-1	DG-W5S-0.5-1	12/18/2018	**1**	**16**	**45**	<0.075	**0.56**	**15**	**14**	**160**	**140**	**0.34**	**0.61**	**11**	**0.76**	**0.28**	<0.50	**110**	**280**
DG-W5 (D)	0.5-1	DG-W5 (D)S-0.5-1	12/18/2018	**1.4**	**20**	**66**	<0.093	**0.69**	**16**	**14**	**190**	**140**	**0.091**	**0.83**	**15**	**0.72**	**0.4**	<0.34	**110**	**200**
DG-W5	3.5-4	DG-W5S-3.5-4	12/18/2018	**3.5**	**400**	**240**	**0.26**	**2.4**	**56**	**7.7**	**45**	**7200**	**0.66**	<0.23	**24**	<0.55	**0.46**	<0.41	**36**	**780**
DG-W5	8.5-9	DG-W5S-8.5-9	12/18/2018	**1.2**	**18**	**68**	**0.54**	<0.047	**39**	**18**	**31**	**9.9**	**0.054**	**0.43**	**39**	<0.57	<0.19	<0.53	**44**	**69**
DG-W6	0.5-1	DG-W6S-0.5-1	12/20/2018	**2**	**9.2**	**59**	<0.066	**0.53**	**16**	**4.8**	**74**	**83**	**0.21**	**0.47**	**13**	**0.66**	<0.10	<0.55	**34**	**110**
DG-W6	3.5-4	DG-W6S-3.5-4	12/20/2018	**32**	**18**	**910**	**0.43**	**1.5**	**27**	**6.7**	**770**	**4000**	**1.4**	**0.52**	**24**	**1.4**	**4.1**	<0.30	**19**	**1300**
DG-W7	0.5-1	DG-W7S-0.5-1	1/29/2019	**0.48**	**2.7**	**62**	**0.086**	**0.44**	**14**	**6.9**	**68**	**56**	**0.096**	**0.47**	**22**	**0.37**	<0.12	<1.1	**42**	**98**
DG-W7	3.5-4	DG-W7S-3.5-4	1/29/2019	**65**	**30**	**1300**	<0.21	**3.5**	**70**	**15**	**1100**	**4900**	**0.52**	**1.5**	**72**	**2.1**	**7**	<0.34	**35**	**2200**
DG-W8	0.5-1	DG-W8S-0.5-1	1/29/2019	**17**	**7.6**	**690**	**0.16**	**0.99**	**22**	**5.9**	**150**	**740**	**0.24**	**0.28**	**23**	<0.58	**1.6**	**0.96**	**28**	**700**
DG-W8	3.5-4	DG-W8S-3.5-4	1/29/2019	**19**	**11**	**1200**	**0.67**	**1.5**	**28**	**4.7**	**500**	**2800**	**0.39**	<0.50	**42**	<1.2	**6.3**	<0.56	**26**	**1500**
DG-W8 (D)	3.5-4	DG-W8 (D)S-3.5-4	1/29/2019	**26**	**14**	**1500**	**1**	**2.6**	**36**	**5.4**	**620**	**6600**	**0.46**	**0.84**	**38**	<0.44	**6.6**	<1.1	**31**	**2200**
DG-W9	0.5-1	DG-W9S-0.5-1	12/20/2018	**0.89**	**2.1**	**55**	**0.19**	**0.27**	**26**	**7**	**92**	**77**	**0.075**	**0.42**	**15**	<0.32	<0.11	<0.43	**66**	**96**
DG-W9	3.5-4	DG-W9S-3.5-4	12/20/2018	**27**	**38**	**960**	**0.51**	**2.8**	**33**	**11**	**950**	**7500**	**0.93**	**1.5**	**40**	<1.6	**3.2**	<0.31	**25**	**2700**
DG-W9	8.5-9	DG-W9S-8.5-9	12/20/2018	**22**	**29**	**600**	**0.89**	**3.2**	**46**	**9.2**	**530**	**2200**	**0.1**	**5.4**	**48**	<1.1	**4.4**	<1.5	**29**	**1300**
DG-X1	0.5-1	DG-X1S-0.5-1	12/17/2018	**3.3**	**110**	**140**	**0.25**	<0.047	**170**	**26**	**44**	**25**	**11**	<0.24	**240**	<0.57	<0.19	<1.1	**78**	**85**
DG-X1 (D)	0.5-1	DG-X1 (D)S-0.5-1	12/17/2018	**1.4**	**67**	**70**	<0.11	<0.042	**67**	**17**	**59**	**20**	**3.1**	<0.22	**92**	**0.56**	<0.17	<0.55	**76**	**65**
DG-X1	3.5-4	DG-X1S-3.5-4	12/17/2018	**2.1**	**16**	**98**	**0.29**	<0.048	**110**	**17**	**29**	**5.1**	**0.16**	<0.25	**120**	<0.58	<0.20	<0.50	**52**	**50**
DG-X10	0.5-1	DG-X10S-0.5-1	1/29/2019	**1.1**	<0.29	**24**	<0.11	**0.12**	**6.8**	**9.8**	**110**	**53**	**0.041**	<0.22	**2.9**	<0.51	<0.17	<0.56	**87**	**42**
DG-X10	3.5-4	DG-X10S-3.5-4	1/29/2019	**21**	**9.8**	**490**	**0.12**	**0.87**	**18**	**3.4**	**330**	**1800**	**0.62**	**0.33**	**16**	<0.53	**1.9**	<0.50	**12**	**700**
DG-X11	0.5-1	DG-X11S-0.5-1	1/28/2019	**7**	**11**	**26**	<0.10	**0.11**	**12**	**7.7**	**130**	**130**	**0.051**	<0.20	**20**	<0.48	<0.16	<0.51	**52**	**37**
DG-X11	3.5-4	DG-X11S-3.5-4	1/28/2019	**0.68**	**11**	**39**	**0.16**	**0.12**	**53**	**6.4**	**6.7**	**2.6**	**0.011**	<0.23	**39**	<0.54	<0.18	<0.46	**42**	**21**
DG-X12	0.5-1	DG-X12S-0.5-1	1/28/2019	**0.99**	**6.6**	**80**	<0.13	**0.67**	**55**	**9**	**160**	**270**	**0.24**	**2.6**	**32**	**1.7**	<0.20	<0.52	**67**	**170**
DG-X12	3.5-4	DG-X12S-3.5-4	1/28/2019	**15**	**15**	**1900**	**0.49**	**3.4**	**65**	**6.8**	**800**	**4700**	**0.79**	**0.52**	**44**	<0.58	**6.6**	<0.57	**36**	**2600**
DG-X13	0.5-1	DG-X13S-0.5-1	1/22/2019	**7**	**6.6**	**230**	<0.19	**2.3**	**35**	**10**	**240**	**950**	**0.33**	**1.2**	**34**	**1.8**	**1.4**	<0.56	**65**	**530**
DG-X13	3.5-4	DG-X13S-3.5-4	1/22/2019	**1.2**	**3.7**	**55**	**0.4**	**0.14**	**24**	**13**	**60**	**7.8**	**0.038**	**0.3**	**22**	<0.44	<0.15	<0.85	**65**	**37**
DG-X13 (D)	3.5-4	DG-X13 (D)S-3.5-4	1/22/2019	**4.6**	**9.8**	**88**	<0.11	**0.32**	**12**	**14**	**150**	**970**	**0.077**	<0.22	**33**	**0.94**	<0.18	**0.77**	**110**	**200**
DG-X16	0.5-1	DG-X16S-0.5-1	1/23/2019	<5.0	**4.3**	**39**	<0.25	**0.36**	**35**	**9.1**	**140**	**110**	**0.12**	**1.2**	**26**	<1.7	<0.89	**0.52**	**75**	**76**
DG-X16	3.5-4	DG-X16S-3.5-4	1/23/2019	<4.9	**5.6**	**64**	**0.42**	<0.25	**52**	**9.5**	**71**	**100**	**2.2**	<0.99	**71**	<1.7	<0.88	<5.0	**60**	**49**
DG-X17	0.5-1	DG-X17S-0.5-1	1/28/2019	**0.73**	**4.3**	**95**	**0.18**	**0.16**	**26**	**6.1**	**62**	**55**	**0.061**	**0.36**	**32**	**0.9**	<0.13	<4.9	**35**	**56**
DG-X17	3.5-4	DG-X17S-3.5-4	1/28/2019	**33**	**40**	**63**	<0.12	**13**	**53**	**12**	**730**	**17000**	**0.073**	**1.7**	**59**	**4**	**5.3**	<0.38	**36**	**5700**
DG-X18	0.5-1	DG-X18S-0.5-1	1/24/2019	**1.1**	**5.5**	**85**	<0.11	**0.47**	**86**	**14**	**29**	**51**	**0.075**	**0.38**	**120**	<0.51	**0.24**	<1.4	**62**	**45**
DG-X18	3.5-4	DG-X18S-3.5-4	1/24/2019	**7.2**	**16**	**130**	<0.13	**2.2**	**74**	**16**	**320**	**2000**	**0.26**	**6.5**	**79**	**5.6**	<0.49	**1.1**	**53**	**360**
DG-X19	0.5-1	DG-X19S-0.5-1	2/5/2019	**0.68**	**11**	**310**	**0.83**	<0.038	**20**	**12**	**34**	**38**	**0.11**	**2.6**	**39**	**1.4**	<0.16	<1.4	**21**	**64**
DG-X19	3.5-4	DG-X19S-3.5-4	2/5/2019	**12**	**70**	**520**	**0.12**	**0.21**	**41**	**13**	**260**	**2900**	**0.14**	**1.2**	**50**	**5.6**	<0.37	**1**	**55**	**650**
DG-X2	0.5-1	DG-X2S-0.5-1	12/14/2018	**5**	**560**	**100**	<0.089	**0.31**	**27**	**9.4**	**160**	**220**	**3.1**	**0.2**	**31**	**0.42**	**1**	**1.5**	**69**	**220**
DG-X2	3.5-4	DG-X2S-3.5-4	12/14/2018	**1.7**	**8.8**	**35**	**0.63**	**0.4**	**30**	**16**	**44**	**25**	**0.036**	**0.29**	**32**	**0.88**	**0.33**	<0.40	**39**	**110**
DG-X3	0.5-1	DG-X3S-0.5-1	12/14/2018	**9.8**	**180**	**75**	**0.29**	**1.5**	**30**	**9.8**	**180**	**420**	**0.28**	**2.8**	**37**	**1.3**	<0.18	<0.47	**50**	**1200**
DG-X3	3.5-4	DG-X3S-3.5-4	12/14/2018	**0.88**	**9.3**	**52**	**0.61**	**0.078**	**26**	**28**	**38**	**14**	**0.034**	**0.69**	**33**	**0.58**	<0.11	<0.53	**33**	**66**
DG-X4	0.5-1	DG-X4S-0.5-1	12/18/2018	**1.4**	**54**	**36**	<0.10	<0.040	**5.9**	**7.8**	**74**	**40**	**0.17**	<0.20	**4.6**	**0.65**	<0.16	<0.31	**58**	**54**
DG-X4	3.5-4	DG-X4S-3.5-4	12/18/2018	**0.61**	**29**	**37**	**0.16**	<0.041	**50**	**5.2**	**7.3**	**1.5**	**0.014**	<0.21	**38**	<0.50	<0.17	<0.46	**35**	**17**
DG-X5	0.5-1	DG-X5S-0.5-1	1/8/2019	**2**	**120**	**60**	<0.073	**0.44**	**15**	**15**	**140**	**130**	**0.17**	**3.8**	**16**	**2.8**	**0.5**	<0.48	**97**	**140**
DG-X5	3.5-4	DG-X5S-3.5-4	1/8/2019	**1.8**	**36**	**56**	**0.14**	<0.033	**59**	**7**	**8.5**	**5.7**	**0.034**	<0.17	**40**	**1.1**	<0.13	<0.32	**43**	**31**
DG-X6	0.5-1	DG-X6S-0.5-1	12/20/2018	**2.9**	**6.3**	**81**	<0.11	**0.96**	**26**	**7.2**	**150**	**130**	**0.19**	**0.86**	**32**	<0.50	<0.17	<0.38	**38**	**230**
DG-X6	3.5-4	DG-X6S-3.5-4	12/20/2018	**13**	**19**	**890**	**0.37**	**9**	**69**	**9.4**	**360**	**1800**	**0.68**	**0.67**	**160**	**0.98**	**3.6**	<0.49	**19**	**2400**
DG-X7	0.5-1	DG-X7S-0.5-1	12/19/2018	**6.9**	**5.3**	**75**	<0.099	**0.96**	**24**	**7.6**	**1200**	**230**	**0.25**	**2.1**	**31**	<0.46	<0.15	<0.76	**44**	**210**
DG-X7 (D)	0.5-1	DG-X7 (D)S-0.5-1	12/19/2018	**2.5**	**8.2**	**98**	**0.22**	**1.2**	**37**	**10**	**150**	**220**	**0.16**	**2.3**	**27**	<0.48	<0.16	<0.44	**67**	**280**
DG-X7	3.5-4	DG-X7S-3.5-4	12/19/2018	**1.7**	**3.5**	**100**	<0.12	**0.27**	**15**	**4.6**	**82**	**210**	**0.029**	**0.39**	**13**	<0.55	**0.43**	<0.47	**27**	**130**

Table 2: Metals Concentrations in Soil
UPC OU-2
Brisbane, California

Sample Location	Depth Range (ft bgs)	Sample Name	Collection Date	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
Direct Exposure Human Health Risk Level Residential Soil Exposure ESL [1]				1.1E+01	6.7E-02	1.5E+04	1.6E+01	7.8E+01	1.2E+05	2.3E+01	3.1E+03	8.0E+01	1.3E+01	3.9E+02	8.2E+02	3.9E+02	3.9E+02	7.8E-01	3.9E+02	2.3E+04
Regional Background [2]				5.5E+00	1.9E+01	3.2E+02	1.0E+00	2.7E+00	1.0E+02	2.5E+01	6.9E+01	1.6E+01	4.0E-01	7.4E+00	1.2E+02	5.6E+00	1.8E+00	7.6E+00	7.4E+01	1.1E+02
Units				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
DG-X8	0.5-1	DG-X8S-0.5-1	1/29/2019	**1.8**	**4.7**	**150**	<0.11	**0.45**	**17**	**5.1**	**48**	**240**	**0.08**	<0.21	**20**	<0.49	**1.3**	<0.53	**26**	**190**
DG-X8	3.5-4	DG-X8S-3.5-4	1/29/2019	**28**	**34**	**970**	<0.25	**5.9**	**38**	**12**	**790**	**9600**	**0.19**	<0.49	**42**	**4**	**4.8**	<0.48	**32**	**4000**
DG-X9	0.5-1	DG-X9S-0.5-1	1/10/2019	<0.43	<0.44	**65**	<0.17	<0.064	**41**	**29**	**250**	**46**	**0.062**	<0.33	**5.2**	**1.9**	<0.26	<1.1	**260**	**120**
DG-X9	3.5-4	DG-X9S-3.5-4	1/10/2019	**16**	**8.3**	**520**	**0.11**	**1.2**	**14**	**3.3**	**310**	**1300**	**2.1**	**0.76**	**33**	**2.7**	**1.7**	**3.6**	**12**	**1400**
DG-Y1	0.5-1	DG-Y1S-0.5-1	12/13/2018	<0.21	**1.9**	**39**	<0.084	**0.092**	**9.8**	**6.2**	**96**	**17**	**0.1**	<0.17	**10**	<0.39	**0.13**	<0.41	**56**	**44**
DG-Y1	3.5-4	DG-Y1S-3.5-4	12/13/2018	**2.8**	**32**	**110**	**0.32**	**0.092**	**180**	**22**	**38**	**6.8**	**2.3**	**0.16**	**210**	<0.30	**0.27**	<0.37	**66**	**56**
DG-Y10	0.5-1	DG-Y10S-0.5-1	1/29/2019	**5.8**	**7.4**	**70**	<0.084	**2.5**	**20**	**9.8**	**140**	**250**	**0.18**	**1.1**	**12**	**1.3**	**0.28**	<0.29	**63**	**310**
DG-Y10	3.5-4	DG-Y10S-3.5-4	1/29/2019	**1.3**	<0.20	**18**	<0.075	**0.21**	**7.6**	**7.9**	**83**	**20**	**0.037**	<0.15	**3.1**	**0.6**	<0.12	**0.45**	**68**	**57**
DG-Y11	0.5-1	DG-Y11S-0.5-1	1/21/2019	**5.3**	**14**	**94**	<0.11	**0.72**	**21**	**8.4**	**200**	**500**	**0.4**	**0.36**	**24**	<0.50	<0.17	**0.46**	**58**	**210**
DG-Y11	3.5-4	DG-Y11S-3.5-4	1/21/2019	**2.4**	**11**	**360**	**0.79**	**0.29**	**26**	**15**	**220**	**610**	**0.097**	<0.16	**34**	<0.38	<0.13	<0.48	**33**	**140**
DG-Y12	0.5-1	DG-Y12S-0.5-1	1/25/2019	<0.26	**1.6**	**27**	<0.10	**0.2**	**5.1**	**0.6**	**9.3**	**120**	**0.0064**	<0.20	**3.9**	<0.48	<0.16	<0.37	**4.6**	**37**
DG-Y12	3.5-4	DG-Y12S-3.5-4	1/25/2019	**9.5**	**6**	**120**	<0.13	**0.67**	**23**	**12**	**270**	**340**	**0.21**	**0.28**	**19**	<0.60	**0.28**	<0.46	**80**	**340**
DG-Y13	0.5-1	DG-Y13S-0.5-1	1/31/2019	**1.8**	**4.1**	**69**	**0.45**	**0.41**	**42**	**5.6**	**34**	**120**	**0.047**	**0.25**	**25**	**1**	<0.14	<0.58	**35**	**140**
DG-Y13 (D)	0.5-1	DG-Y13 (D)S-0.5-1	1/31/2019	**0.95**	**3.3**	**58**	**0.33**	**0.36**	**37**	**5.9**	**27**	**91**	**0.063**	<0.23	**24**	<0.54	**0.21**	<0.41	**33**	**110**
DG-Y13	3.5-4	DG-Y13S-3.5-4	1/31/2019	**8.5**	**15**	**800**	**0.42**	**2.2**	**29**	**7.4**	**510**	**2700**	**8.3**	**0.42**	**23**	**3**	**2.3**	<0.52	**31**	**1900**
DG-Y14	0.5-1	DG-Y14S-0.5-1	1/31/2019	**2.1**	**3.5**	**74**	**0.37**	**0.37**	**23**	**11**	**110**	**160**	**0.11**	**0.28**	**19**	<0.53	<0.18	**1.6**	**72**	**120**
DG-Y14 (D)	0.5-1	DG-Y14 (D)S-0.5-1	1/31/2019	**1.5**	**2.1**	**48**	**0.27**	**0.33**	**17**	**11**	**130**	**110**	**0.16**	<0.18	**11**	**1.2**	<0.14	<0.51	**90**	**88**
DG-Y14	3.5-4	DG-Y14S-3.5-4	1/31/2019	**1.2**	**3.3**	**89**	**0.72**	**0.27**	**120**	**19**	**31**	**10**	**0.37**	<0.25	**130**	**0.81**	**0.27**	<0.41	**63**	**61**
DG-Y15	0.5-1	DG-Y15S-0.5-1	1/31/2019	**2.5**	**6.8**	**60**	**0.11**	**0.96**	**56**	**6.9**	**73**	**200**	**0.12**	**0.79**	**19**	<0.44	<0.15	<0.56	**45**	**520**
DG-Y15	3.5-4	DG-Y15S-3.5-4	1/31/2019	**4.2**	**4.2**	**75**	**0.38**	**0.4**	**130**	**18**	**65**	**15**	**1.2**	**0.28**	**120**	**1.9**	<0.13	<0.43	**90**	**82**
DG-Y15 (D)	3.5-4	DG-Y15 (D)S-3.5-4	1/31/2019	**5.2**	**4.2**	**51**	**0.47**	**0.51**	**150**	**19**	**75**	**23**	**0.73**	<0.21	**150**	**1.5**	<0.17	<0.38	**96**	**120**
DG-Y15	7.5-8	DG-Y15S-7.5-8	1/31/2019	**1.7**	**7.6**	**42**	**0.84**	**0.37**	**31**	**14**	**50**	**20**	**0.081**	**0.2**	**31**	**1.4**	<0.12	<0.48	**36**	**87**
DG-Y16	0.5-1	DG-Y16S-0.5-1	1/24/2019	**3.7**	**5.4**	**60**	**0.17**	**0.65**	**31**	**6.7**	**220**	**230**	**0.085**	**0.6**	**52**	**0.84**	<0.16	**0.37**	**65**	**170**
DG-Y16 (D)	0.5-1	DG-Y16 (D)S-0.5-1	1/24/2019	**2.1**	**4.9**	**66**	<0.11	**0.61**	**26**	**7.6**	**110**	**200**	**0.096**	**0.91**	**48**	**0.64**	<0.18	<0.47	**64**	**160**
DG-Y16	3.5-4	DG-Y16S-3.5-4	1/24/2019	**16**	**61**	**110**	**0.13**	**0.94**	**21**	**12**	**430**	**2100**	**0.15**	**0.39**	**56**	<0.47	**0.19**	<0.51	**70**	**220**
DG-Y17	0.5-1	DG-Y17S-0.5-1	1/23/2019	<5.0	**3.6**	**65**	<0.25	**2.1**	**14**	**8.4**	**180**	**170**	**0.065**	<1.0	**34**	<1.7	<0.89	<0.46	**80**	**510**
DG-Y17	3.5-4	DG-Y17S-3.5-4	1/23/2019	**6.2**	**11**	**88**	<0.25	**0.64**	**24**	**6.2**	**240**	**440**	**0.42**	**1.2**	**55**	<1.7	<0.88	<5.0	**57**	**100**
DG-Y18	0.5-1	DG-Y18S-0.5-1	1/23/2019	<5.0	**3.9**	**51**	<0.25	<0.25	**15**	**3.5**	**17**	**4.4**	<0.012	<1.0	**11**	<1.7	<0.89	<4.9	**32**	**29**
DG-Y18	3.5-4	DG-Y18S-3.5-4	1/23/2019	<5.0	**12**	**52**	<0.25	**1.9**	**21**	**11**	**140**	**310**	**0.099**	<1.0	**27**	<1.7	<0.89	<5.0	**83**	**290**
DG-Y19	0.5-1	DG-Y19S-0.5-1	1/28/2019	**1**	**3.3**	**65**	**0.22**	**0.22**	**48**	**8.8**	**23**	**18**	**0.031**	**0.27**	**73**	**0.91**	<0.19	<5.0	**48**	**50**
DG-Y19	3.5-4	DG-Y19S-3.5-4	1/28/2019	**2.7**	**32**	**99**	**0.31**	**0.42**	**92**	**15**	**77**	**140**	**2.4**	<0.24	**91**	**1**	<0.19	**19**	**63**	**120**
DG-Y19	7.5-8	DG-Y19S-7.5-8	1/28/2019	**2**	**2**	**90**	<0.13	**0.12**	**57**	**10**	**10**	**2.7**	**0.042**	<0.26	**59**	<0.60	<0.20	**25**	**43**	**32**
DG-Y2	0.5-1	DG-Y2S-0.5-1	12/14/2018	**2.2**	**92**	**69**	<0.12	**0.32**	**24**	**7.5**	**110**	**110**	**0.46**	**0.48**	**24**	<0.54	**0.35**	**17**	**36**	**110**
DG-Y2	3.5-4	DG-Y2S-3.5-4	12/14/2018	**2.4**	**130**	**72**	**0.35**	**0.036**	**65**	**17**	**43**	**25**	**0.31**	<0.15	**86**	<0.35	**0.44**	<0.52	**52**	**73**
DG-Y3	0.5-1	DG-Y3S-0.5-1	12/18/2018	**12**	**110**	**200**	**0.12**	**12**	**82**	**17**	**440**	**940**	**1.2**	**9.4**	**140**	**3.1**	**1.1**	<0.34	**66**	**1500**
DG-Y3	3.5-4	DG-Y3S-3.5-4	12/18/2018	**1.5**	**34**	**61**	**0.6**	**0.3**	**33**	**19**	**32**	**12**	**0.082**	**0.44**	**37**	**0.68**	<0.18	<0.55	**39**	**73**
DG-Y4	0.5-1	DG-Y4S-0.5-1	12/18/2018	**4.1**	**94**	**200**	<0.11	**1**	**49**	**10**	**1300**	**360**	**0.26**	**1.3**	**63**	**1.4**	**0.41**	<0.51	**41**	**370**
DG-Y4	3.5-4	DG-Y4S-3.5-4	12/18/2018	**0.8**	**36**	**90**	**0.28**	**0.077**	**47**	**9.5**	**24**	**20**	**0.029**	**0.45**	**60**	**0.72**	**0.21**	<0.48	**26**	**42**
DG-Y4 (D)	3.5-4	DG-Y4 (D)S-3.5-4	12/18/2018	**0.8**	**130**	**190**	**0.78**	<0.046	**74**	**13**	**28**	**58**	**0.047**	**0.7**	**67**	**0.71**	<0.19	<0.34	**56**	**61**
DG-Y5	0.5-1	DG-Y5S-0.5-1	12/18/2018	**2.9**	**9.7**	**82**	<0.071	**1.9**	**76**	**9.6**	**160**	**270**	**0.41**	**2.6**	**30**	<0.33	**0.24**	<0.54	**64**	**340**
DG-Y5	3.5-4	DG-Y5S-3.5-4	12/18/2018	**0.69**	**2.7**	**26**	<0.084	**0.051**	**19**	**3**	**5**	**7.9**	**0.0086**	<0.17	**14**	**0.55**	<0.13	<0.32	**15**	**16**
DG-Y6	0.5-1	DG-Y6S-0.5-1	12/20/2018	**1.6**	**8.3**	**150**	<0.11	**0.58**	**18**	**11**	**81**	**500**	**0.2**	**1.8**	**38**	**0.69**	**0.64**	<0.38	**44**	**150**
DG-Y6	3.5-4	DG-Y6S-3.5-4	12/20/2018	**19**	**31**	**2500**	**1.2**	**3.7**	**140**	**9.5**	**660**	**6400**	**0.26**	**1.7**	**83**	**1**	**5**	<0.50	**32**	**2500**
DG-Y7	0.5-1	DG-Y7S-0.5-1	1/9/2019	**1.8**	**3.9**	**71**	**0.14**	**0.28**	**18**	**5.3**	**56**	**110**	**0.042**	**0.42**	**23**	<0.39	**0.13**	<0.50	**20**	**170**
DG-Y7	3.5-4	DG-Y7S-3.5-4	1/9/2019	**26**	**13**	**1700**	**0.82**	**2.6**	**38**	**4.6**	**3400**	**6700**	**0.43**	**2.1**	**39**	**1.7**	**9.9**	<0.38	**29**	**2400**
DG-Y8	0.5-1	DG-Y8S-0.5-1	1/29/2019	**95**	**22**	**2300**	**0.52**	**3.9**	**47**	**7.2**	**1100**	**7600**	**0.61**	**0.64**	**45**	<1.3	**6.9**	<0.52	**27**	**2900**
DG-Y8	3.5-4	DG-Y8S-3.5-4	1/29/2019	**79**	**68**	**1100**	<0.20	**5.2**	**44**	**12**	**15000**	**5000**	**0.7**	**2.8**	**82**	**2.1**	**9.1**	<1.3	**15**	**2800**
DG-Y9	0.5-1	DG-Y9S-0.5-1	12/20/2018	<0.27	**5**	**39**	**0.34**	**0.21**	**11**	**12**	**150**	**12**	**0.1**	**0.64**	**4.1**	**0.96**	<0.17	**1**	**120**	**58**
DG-Y9	3.5-4	DG-Y9S-3.5-4	12/20/2018	**100**	**47**	**1100**	<0.54	**2.1**	**51**	**16**	**1100**	**4900**	**0.74**	**1.2**	**92**	<2.5	**18**	<0.48	**56**	**2100**
DG-Z10	0.5-1	DG-Z10S-0.5-1	1/29/2019	**7.6**	**110**	**80**	<0.074	**2.3**	**410**	**8.5**	**160**	**250**	**0.16**	**1.1**	**12**	**1.1**	**0.17**	<2.4	**61**	**430**
DG-Z10	3.5-4	DG-Z10S-3.5-4	1/29/2019	**60**	**24**	**1400**	<0.29	**3.8**	**220**	**10**	**1600**	**16000**	**1**	**0.63**	**42**	**9**	**11**	**0.57**	**29**	**2700**
DG-Z11	0.5-1	DG-Z11S-0.5-1	1/28/2019	**2.3**	**18**	**41**	<0.11	**0.56**	**23**	**6.2**	**100**	**170**	**0.11**	**1.9**	**16**	<0.52	<0.18	<1.3	**44**	**88**

Table 2: Metals Concentrations in Soil
UPC OU-2
Brisbane, California

Sample Location	Depth Range (ft bgs)	Sample Name	Collection Date	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
Direct Exposure Human Health Risk Level Residential Soil Exposure ESL [1]				1.1E+01	6.7E-02	1.5E+04	1.6E+01	7.8E+01	1.2E+05	2.3E+01	3.1E+03	8.0E+01	1.3E+01	3.9E+02	8.2E+02	3.9E+02	3.9E+02	7.8E-01	3.9E+02	2.3E+04
Regional Background [2]				5.5E+00	1.9E+01	3.2E+02	1.0E+00	2.7E+00	1.0E+02	2.5E+01	6.9E+01	1.6E+01	4.0E-01	7.4E+00	1.2E+02	5.6E+00	1.8E+00	7.6E+00	7.4E+01	1.1E+02
Units				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
DG-Z11	3.5-4	DG-Z11S-3.5-4	1/28/2019	**9.5**	**76**	**120**	<0.12	**0.36**	**18**	**9**	**140**	**360**	**0.07**	<0.23	**28**	<0.54	<0.18	<0.50	**65**	**210**
DG-Z12	0.5-1	DG-Z12S-0.5-1	1/25/2019	**1.1**	**2**	**51**	<0.12	**0.49**	**14**	**13**	**100**	**140**	**0.078**	<0.24	**9.3**	**1.5**	<0.19	<0.52	**110**	**120**
DG-Z12 (D)	0.5-1	DG-Z12 (D)S-0.5-1	1/25/2019	**0.68**	**1.4**	**42**	<0.10	**0.29**	**8.7**	**15**	**96**	**53**	**0.038**	<0.20	**5.7**	**0.63**	<0.16	<0.54	**120**	**73**
DG-Z12	3.5-4	DG-Z12S-3.5-4	1/25/2019	**17**	**23**	**290**	<0.24	**2**	**40**	**14**	**330**	**960**	**0.52**	<0.47	**41**	**4**	**1.5**	<0.46	**31**	**640**
DG-Z13	0.5-1	DG-Z13S-0.5-1	1/28/2019	<0.30	**7**	**330**	**0.19**	**0.13**	**28**	**4.2**	**39**	**32**	**0.022**	**0.66**	**18**	<0.55	<0.19	<1.1	**67**	**65**
DG-Z13	3.5-4	DG-Z13S-3.5-4	1/28/2019	**5.9**	**14**	**350**	**0.88**	**0.33**	**55**	**16**	**160**	**550**	**0.22**	<0.25	**55**	<0.58	**0.41**	<0.53	**54**	**630**
DG-Z14	0.5-1	DG-Z14S-0.5-1	1/24/2019	**2.2**	**7.7**	**54**	<0.13	**1.1**	**29**	**6**	**120**	**670**	**0.95**	**5.8**	**25**	<0.59	**0.36**	<0.56	**56**	**99**
DG-Z14	3.5-4	DG-Z14S-3.5-4	1/24/2019	<0.24	**1.3**	**53**	<0.093	**0.37**	**12**	**8.6**	**98**	**1.8**	**0.023**	<0.18	**9.7**	<0.43	<0.14	<0.57	**77**	**36**
DG-Z15	0.5-1	DG-Z15S-0.5-1	1/24/2019	**2.9**	**2.7**	**39**	<0.10	**0.45**	**36**	**10**	**110**	**180**	**0.044**	**0.36**	**16**	<0.47	<0.16	**0.83**	**76**	**55**
DG-Z15	3.5-4	DG-Z15S-3.5-4	1/24/2019	**3.4**	**1**	**330**	<0.092	**0.6**	**49**	**21**	**43**	**5.4**	**0.11**	<0.18	**25**	**0.43**	<0.14	<0.45	**160**	**58**
DG-Z16	0.5-1	DG-Z16S-0.5-1	1/24/2019	**4.9**	**3.6**	**39**	**0.23**	**0.79**	**49**	**6.1**	**160**	**800**	**0.27**	**0.88**	**43**	**1.5**	<0.15	<0.41	**67**	**120**
DG-Z16	3.5-4	DG-Z16S-3.5-4	1/24/2019	**2**	**2**	**30**	<0.073	**0.42**	**35**	**7**	**76**	**86**	**0.07**	**0.27**	**23**	**0.45**	<0.11	<0.43	**60**	**74**
DG-Z16 (D)	3.5-4	DG-Z16 (D)S-3.5-4	1/24/2019	**1.8**	**1.7**	**21**	<0.080	**0.38**	**28**	**7.1**	**79**	**67**	**0.073**	**0.27**	**20**	**1.2**	<0.12	**0.39**	**64**	**68**
DG-Z17	0.5-1	DG-Z17S-0.5-1	1/28/2019	**2.6**	**6.7**	**84**	<0.093	**0.59**	**20**	**7.1**	**130**	**260**	**0.13**	**0.62**	**40**	**0.83**	<0.14	<0.36	**43**	**140**
DG-Z17 (D)	0.5-1	DG-Z17 (D)S-0.5-1	1/28/2019	**3.6**	**10**	**66**	<0.11	**0.63**	**25**	**9.9**	**230**	**270**	**0.14**	**2.1**	**37**	**1.8**	**0.29**	**17**	**67**	**160**
DG-Z17	3.5-4	DG-Z17S-3.5-4	1/28/2019	**6.1**	**12**	**93**	<0.12	**0.46**	**11**	**3.5**	**250**	**630**	**0.019**	**0.85**	**34**	**1.6**	<0.18	**26**	**38**	**73**
DG-Z17	7.5-8	DG-Z17S-7.5-8	1/28/2019	**1.8**	**5.1**	**45**	**0.35**	**0.24**	**33**	**12**	**35**	**15**	**0.041**	<0.18	**28**	**1.7**	<0.15	**15**	**42**	**62**
DG-Z18	0.5-1	DG-Z18S-0.5-1	1/23/2019	<5.0	**4.6**	**130**	**0.48**	<0.25	**46**	**11**	**42**	**9.3**	**0.07**	<1.0	**62**	<1.7	<0.89	**16**	**50**	**49**
DG-Z18	3.5-4	DG-Z18S-3.5-4	1/23/2019	**6.6**	**11**	**55**	**0.32**	**0.56**	**19**	**8.4**	**210**	**570**	**0.054**	<1.0	**46**	<1.7	<0.89	<5.0	**68**	**290**
DG-Z19	0.5-1	DG-Z19S-0.5-1	2/5/2019	<0.26	**2.9**	**77**	**0.16**	**0.12**	**29**	**7.3**	**30**	**14**	**0.062**	**0.27**	**25**	<0.46	<0.16	<5.0	**56**	**42**
DG-Z19	3.5-4	DG-Z19S-3.5-4	2/5/2019	**3.7**	**130**	**120**	**0.33**	<0.037	**110**	**17**	**30**	**12**	**10**	**0.25**	**150**	**2**	<0.15	<0.45	**60**	**89**
DG-Z2	0.5-1	DG-Z2S-0.5-1	12/14/2018	**2.1**	**74**	**95**	<0.12	**0.47**	**27**	**10**	**120**	**190**	**0.28**	**0.79**	**27**	**0.68**	**0.56**	<0.43	**67**	**180**
DG-Z2	3.5-4	DG-Z2S-3.5-4	12/14/2018	**2.9**	**99**	**90**	**0.13**	<0.043	**92**	**17**	**29**	**7.1**	**7.6**	<0.22	**170**	<0.52	**0.42**	<0.52	**64**	**46**
DG-Z3	0.5-1	DG-Z3S-0.5-1	12/14/2018	**5**	**290**	**100**	<0.098	**0.31**	**22**	**11**	**210**	**370**	**0.28**	**0.83**	**29**	**1.6**	<0.15	<0.50	**76**	**130**
DG-Z3	3.5-4	DG-Z3S-3.5-4	12/14/2018	**1.4**	**43**	**120**	<0.068	**0.092**	**120**	**20**	**39**	**20**	**3**	**0.7**	**160**	**0.8**	<0.11	<0.44	**75**	**79**
DG-Z4	0.5-1	DG-Z4S-0.5-1	12/18/2018	**34**	**840**	**100**	**0.12**	**1.8**	**18**	**10**	**200**	**2100**	**1.1**	**0.86**	**16**	**1.3**	**0.62**	<0.30	**64**	**260**
DG-Z4	3.5-4	DG-Z4S-3.5-4	12/18/2018	**0.87**	**72**	**80**	**0.4**	**0.081**	**44**	**9**	**21**	**13**	**0.088**	**0.42**	**75**	**0.44**	<0.15	<0.37	**25**	**38**
DG-Z5	0.5-1	DG-Z5S-0.5-1	1/8/2019	**1.6**	**31**	**62**	<0.091	**0.36**	**14**	**11**	**140**	**160**	**0.12**	**0.33**	**9.7**	**1.5**	**0.25**	<0.42	**88**	**160**
DG-Z5	3.5-4	DG-Z5S-3.5-4	1/8/2019	**1.3**	**11**	**36**	**0.13**	<0.034	**30**	**4.3**	**5.9**	**3.2**	**0.021**	**0.26**	**23**	<0.42	<0.14	**0.57**	**22**	**19**
DG-Z6	0.5-1	DG-Z6S-0.5-1	12/20/2018	**2.3**	**9.5**	**82**	<0.092	**0.63**	**26**	**11**	**110**	**190**	**0.11**	**1.1**	**29**	<0.43	<0.14	<0.40	**67**	**160**
DG-Z6 (D)	0.5-1	DG-Z6 (D)S-0.5-1	12/20/2018	**2.6**	**11**	**94**	<0.10	**0.73**	**25**	**12**	**120**	**130**	**0.095**	**0.69**	**32**	<0.47	<0.16	**0.82**	**71**	**170**
DG-Z6	3.5-4	DG-Z6S-3.5-4	12/20/2018	**33**	**16**	**1300**	**0.72**	**4.3**	**39**	**6.7**	**640**	**5800**	**0.37**	**0.66**	**100**	<0.54	**4.2**	<0.46	**27**	**3900**
DG-Z7	0.5-1	DG-Z7S-0.5-1	11/21/2018	**26**	**18**	**1300**	**0.8**	**2.3**	**46**	**6.1**	**570**	**3200**	**0.51**	**0.76**	**67**	<0.56	**4.7**	<0.52	**35**	**1500**
DG-Z7	0.5-1	DG-Z7S-0.5-1	2/4/2019	**3.7**	**7.3**	**63**	<0.12	**1.2**	**28**	**10**	**120**	**220**	**0.21**	**1.6**	**39**	**2.6**	<0.19	<0.54	**54**	**230**
DG-Z7	3.5-4	DG-Z7S-3.5-4	11/21/2018	**2.4**	**5.2**	**130**	<0.11	**0.63**	**23**	**9.5**	**84**	**130**	**0.12**	**0.83**	**34**	<0.50	**0.7**	**1.4**	**47**	**170**
DG-Z7	3.5-4	DG-Z7S-3.5-4	2/4/2019	**22**	**11**	**1400**	**0.8**	**2.1**	**34**	**4.6**	**570**	**4300**	**0.56**	**0.44**	**69**	**0.96**	**5.5**	<0.48	**26**	**1900**
DG-Z8	0.5-1	DG-Z8S-0.5-1	1/29/2019	**19**	**13**	**550**	**0.25**	**1.4**	**32**	**7.5**	**370**	**1900**	**0.6**	**0.33**	**38**	<0.40	**2.2**	<0.55	**30**	**1200**
DG-Z8	3.5-4	DG-Z8S-3.5-4	1/29/2019	**44**	**29**	**1400**	**0.36**	**8.8**	**42**	**8.7**	**760**	**4900**	**1.5**	**0.64**	**44**	**1.5**	**5.7**	<0.39	**26**	**2700**
DG-Z9	0.5-1	DG-Z9S-0.5-1	1/9/2019	**1.6**	**4.2**	**73**	**0.15**	**0.53**	**15**	**9.9**	**160**	**120**	**0.15**	**0.57**	**11**	**0.8**	<0.12	<1.2	**71**	**210**
DG-Z9 (D)	0.5-1	DG-Z9 (D)S-0.5-1	1/9/2019	**1.6**	**4.6**	**50**	**0.094**	**0.28**	**12**	**9.5**	**130**	**76**	**0.1**	**0.57**	**10**	**0.76**	**0.32**	<0.35	**72**	**110**
DG-Z9	3.5-4	DG-Z9S-3.5-4	1/9/2019	**66**	**28**	**1600**	**0.71**	**5.1**	**48**	**7**	**1200**	**15000**	**0.65**	**2.3**	**37**	**4.4**	**11**	<0.41	**30**	**2900**

Table 2: Metals Concentrations in Soil

UPC OU-2

Brisbane, California

Notes:

1. San Francisco Bay RWQCB, 2019. Summary of Soil ESLs, Jan. 2019 (Rev. 1) - Direct Exposure Human Health Risk Levels (Table S-1) Res: Shallow Soil Exposure. The chromium ESL is for chromium(III).
2. All except cobalt: Table 3, 95th Percentiles in Diamond, D. et al., 2009. Analysis of Background Distributions of Metals in the Soil at Lawrence Berkeley National Laboratory. April.
   Cobalt: RWQCB, 2017. Letter from Vic Pal to Howard Pearce Re Concurrence with Proposed Revisions to the Baylands Soil Processing Acceptance Criteria, Brisbane Landfill, San Mateo County. 14 September.
3. The RWQCB ESL is used as comparison criteria when available unless the regional background is higher, in which case regional background is used as the comparison criteria.
4. Metals were analyzed by USEPA Methods 6010B and 7471A.
5. Non-detect results are presented with "<" followed by the MDL.
6. Results in bold font indicate a detection above the MDL.
7. Gray shading indicates a detection above the screening level.

Abbreviations and Symbols:

"--" - Not Available
"<" - Non-detect result
(D) - Duplicate sample
ft bgs - Feet below ground surface
MDL - Method Detection Limit
mg/kg - milligram per kilogram
ESL - Environmental Screening Level
RWQCB - Regional Water Quality Control Board
USEPA - United States Environmental Protection Agency

Table 3: Polynuclear Aromatic Hydrocarbons and Total Petroleum Hydrocarbons as Diesel and Motor Oil Concentrations in Soil
UPC OU-2
Brisbane, California

Sample Location	Depth Range (ft bgs)	Sample Name	Collection Date	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Chrysene	Dibenzo(a,h)anthracene	Indeno(1,2,3-cd)pyrene	Benzo(a)pyrene Equivalent Total PAHs [4]	2-Methylnaphthalene	Acenaphthene	Acenaphthylene	Anthracene	Benzo(g,h,i)perylene	Dibenzo(a,h)anthracene	Fluoranthene	Fluorene	Naphthalene	Phenanthrene	Pyrene	TPH-Diesel (C10-C28)	TPH-Motor Oil (C24-C36)
Direct Exposure Human Health Risk Level Residential Soil Exposure ESL [1]				1.1E+03	1.1E+02	1.1E+03	1.1E+04	1.1E+05	1.1E+02	1.1E+03	--	2.4E+05	3.6E+06	--	1.8E+07	--	1.1E+02	2.4E+06	2.4E+06	3.8E+03	--	1.8E+06	2.6E+02	1.2E+04
Leaching to Groundwater Levels Non-drinking Water ESL [2]				1.0E+04	5.7E+03	7.5E+04	3.9E+04	1.0E+04	3.9E+05	3.2E+04	--	8.8E+02	1.2E+04	6.4E+03	1.9E+03	2.7E+04	3.9E+05	8.6E+04	6.0E+03	1.2E+03	1.1E+04	4.5E+04	7.3E+03	--
Regional Background [3]				--	--	--	--	--	--	--	4.0E+02	--	--	--	--	--	--	--	--	--	--	--	--	--
Units				µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	mg/kg	mg/kg
DG-AA11	0.5-1	DG-AA11S-0.5-1	1/29/2019	**42**	**74**	**63**	**25**	**35**	<17	**42**	**97**	<24	<14	<12	**33**	**64**	<17	**140**	<11	<17	<8.8	**190**	**310**	**290**
DG-AA11	3.5-4	DG-AA11-3.5-4	1/29/2019	<37	**54**	**53**	**52**	<34	<85	<100	**109**	<120	**220**	**73**	**110**	<100	<85	**51**	**230**	**90**	**290**	**110**	**1400**	**270**
DG-AA15	0.5-1	DG-AA15-0.5-1	1/22/2019	<59	**130**	**160**	**110**	<55	<140	<170	**229**	<200	<110	<95	<79	<170	<140	**78**	<87	<140	<71	**130**	**1400**	**3100**
DG-AA19	0.5-1	DG-AA19-0.5-1	1/24/2019	<40	<40	<40	<40	**180**	<40	<40	**46**	<40	<40	<40	<40	**59**	<40	**50**	<40	<40	**50**	**65**	**350**	**520**
DG-AA19	3.5-4	DG-AA19-3.5-4	1/24/2019	**100**	**230**	**270**	**77**	**170**	<31	**330**	**316**	<31	<31	<31	<31	**430**	<31	**270**	<31	<31	**140**	**320**	**55**	**110**
DG-AA19	8.5-9	DG-AA19-8.5-9	1/24/2019	<8.0	<8.0	<8.0	<8.0	<8.0	<8.0	<8.0	**9**	<8.0	<8.0	<8.0	<8.0	<8.0	<8.0	<8.0	<8.0	<8.0	**10**	<8.0	**5.9**	**3.5**
DG-AA3	0.5-1	DG-AA3-0.5-1	12/18/2018	**80**	**100**	**150**	**62**	**99**	**15**	**42**	**143**	**31**	<5.6	**17**	**31**	**57**	**15**	**130**	<4.4	**24**	**67**	**160**	**76**	**150**
DG-AA3 (D)	0.5-1	DG-AA3 (D)-0.5-1	12/18/2018	**74**	**98**	**130**	**53**	**100**	**18**	**65**	**144**	**53**	<14	**23**	**47**	**270**	**18**	**150**	<11	**47**	**130**	**220**	**97**	**180**
DG-AA3	3.5-4	DG-AA3-3.5-4	12/18/2018	**2.2**	**4.1**	**7.6**	**2.9**	**4.1**	<3.5	<4.2	**7**	<5.0	<2.8	<2.4	<2.0	**4.3**	<3.5	**3.6**	<2.2	<3.5	**8.5**	**5**	**1.9**	**14**
DG-AA3	7-7.5	DG-AA3-7-7.5	12/18/2018	**7**	**2.4**	**20**	**2.2**	**8.8**	<3.5	<4.2	**7**	**11**	<2.8	<2.4	<2.0	**4.8**	<3.5	**6.4**	**16**	**6.9**	**24**	**19**	**2**	<10
DG-AA7	0.5-1	DG-AA7-0.5-1	1/9/2019	**44**	**58**	**130**	**41**	**63**	<17	**42**	**89**	<25	<14	**51**	**240**	**64**	<17	**74**	<11	**21**	**50**	**85**	**45**	**130**
DG-AA7	3.5-4	DG-AA7-3.5-4	1/9/2019	**4.2**	**3.6**	**7.4**	**2.8**	**6.2**	<3.3	<4.0	**7**	<4.7	<2.7	<2.3	**3.4**	<4.1	<3.3	**8.1**	<2.1	<3.3	**7.6**	**9.6**	**14**	**38**
DG-AB13	0.5-1	DG-AB13-0.5-1	1/22/2019	<35	**91**	**140**	**71**	**71**	<83	<99	**154**	<120	<66	<57	**48**	**110**	<83	**57**	<52	<83	**81**	**110**	**610**	**1300**
DG-AB13	3.5-4	DG-AB13-3.5-4	1/22/2019	**1.8**	**4.4**	**5.3**	**3**	**3.3**	<3.4	<4.0	**7**	<4.8	<2.7	<2.3	**3**	**5.8**	<3.4	**4.6**	<2.1	<3.4	**4.7**	**7.5**	**54**	**120**
DG-AB13 (D)	3.5-4	DG-AB13 (D)-3.5-4	1/22/2019	**3.5**	**6.2**	**6.9**	**3.9**	**4.4**	<3.3	<4.0	**9**	<4.8	<2.7	<2.3	**2.6**	**4.3**	<3.3	**5.6**	<2.1	<3.3	**4.5**	**8.8**	**35**	**95**
DG-AB13	13.5-14	DG-AB13-13.5-14	1/22/2019	**19000**	**14000**	**8400**	**4700**	**31000**	<7,000	<8,400	**20738**	**76000**	**25000**	**6200**	**32000**	<8,600	<7,000	**10000**	**33000**	**13000**	**100000**	**63000**	**94000**	**86000**
DG-AB17	0.5-1	DG-AB17-0.5-1	1/24/2019	**47**	<40	**46**	<40	**44**	<40	<40	**52**	<40	<40	<40	<40	**80**	<40	**78**	<40	**120**	<40	**92**	**610**	**370**
DG-AB17	3.5-4	DG-AB17-3.5-4	1/24/2019	**570**	**1100**	**1200**	**300**	**590**	<160	**1100**	**1471**	<160	<160	**250**	<160	**1000**	<160	**1300**	<160	<160	**200**	**1800**	**3100**	**1000**
DG-AB5	0.5-1	DG-AB5-0.5-1	1/29/2019	**550**	**770**	**740**	**290**	**600**	**81**	**250**	**1009**	**79**	<14	**130**	**56**	**290**	**81**	**480**	<11	**100**	**140**	**1000**	**51**	**150**
DG-AB5 (D)	0.5-1	DG-AB5 (D)-0.5-1	1/29/2019	**53**	**84**	**99**	**36**	**56**	**18**	**40**	**122**	**26**	<14	**23**	**21**	**49**	**18**	**91**	<11	**22**	**42**	**120**	**38**	**91**
DG-AB5	3.5-4	DG-AB5-3.5-4	1/29/2019	**5.6**	**12**	**16**	**6.6**	**8**	**3.9**	**8.7**	**19**	<4.9	<2.7	<2.3	**2.2**	**11**	**3.9**	**12**	<2.1	<3.4	**6.3**	**13**	**6.8**	**24**
DG-AB9	0.5-1	DG-AB9-0.5-1	1/30/2019	**5.4**	**4.3**	**10**	<4.0	**14**	<4.0	**4**	**8**	**15**	<4.0	<4.0	<4.0	**4.1**	<4.0	**15**	<4.0	**18**	**26**	**10**	**21**	**22**
DG-AB9	3.5-4	DG-AB9-3.5-4	1/30/2019	**16**	**22**	**32**	**10**	**23**	**5.7**	**32**	**36**	**26**	<3.9	**13**	**28**	**39**	**5.7**	**19**	<3.9	**22**	**21**	**21**	**8.9**	**11**
DG-AC11	0.5-1	DG-AC11-0.5-1	1/29/2019	<59	**110**	**100**	**85**	<55	<140	<160	**202**	<200	**130**	<94	**140**	<170	<140	**57**	<86	<140	**190**	**190**	**5000**	**910**
DG-AC11	3.5-4	DG-AC11-3.5-4	1/29/2019	**350**	**1200**	**840**	**520**	**650**	<690	<830	**1711**	<990	**730**	<480	**610**	**900**	<690	**380**	**610**	<690	**420**	**3200**	**5400**	**9500**
DG-AC11	8.5-9	DG-AC11-8.5-9	1/29/2019	<30	**95**	**100**	**53**	**57**	<69	<83	**146**	<98	<55	<47	**43**	**89**	<69	**87**	<43	<69	**85**	**190**	**770**	**1100**
DG-AC15	0.5-1	DG-AC15-0.5-1	1/31/2019	<150	<190	<210	<210	<140	<340	<410	**305**	<490	<270	<240	<200	<420	<340	**170**	<220	<340	**330**	**260**	**330**	**490**
DG-AC15 (D)	0.5-1	DG-AC15 (D)-0.5-1	1/31/2019	<2.9	**6.2**	**9.6**	**4.9**	**5**	<6.9	<8.2	**11**	**10**	**48**	<4.7	**16**	<8.4	<6.9	**16**	**50**	**9.8**	**79**	**15**	**910**	**1100**
DG-AC15	3.5-4	DG-AC15-3.5-4	1/31/2019	**2000**	**2100**	**3200**	**1200**	**2400**	**250**	**650**	**2949**	<98	**62**	**130**	**2400**	**610**	**250**	**6600**	**96**	**73**	**240**	**6100**	**44**	**38**
DG-AC15	7.5-8	DG-AC15-7.5-8	1/31/2019	**700**	**710**	**830**	**360**	**870**	<350	<420	**1063**	**12000**	**1100**	**410**	**690**	<430	<350	**1400**	**2200**	**6500**	**4200**	**2800**	**3800**	**2300**
DG-AC3	0.5-1	DG-AC3-0.5-1	12/19/2018	**50**	**68**	**110**	**44**	**74**	**11**	**28**	**98**	**33**	**3**	**16**	**27**	**33**	**11**	**78**	**2.9**	**22**	**58**	**100**	**72**	**170**
DG-AC3	3.5-4	DG-AC3-3.5-4	12/19/2018	<1.5	**3**	**7.1**	**2.2**	**3.6**	<3.5	<4.2	**6**	**5.9**	<2.8	<2.4	<2.0	<4.3	<3.5	**2.9**	<2.2	**5.2**	**12**	**3.7**	**4**	**15**
DG-AC7	0.5-1	DG-AC7-0.5-1	1/9/2019	**330**	**500**	**1100**	**330**	**480**	**72**	**240**	**743**	<24	**16**	**170**	**360**	**280**	**72**	**620**	**17**	**28**	**110**	**830**	**85**	**210**
DG-AC7 (D)	0.5-1	DG-AC7 (D)-0.5-1	1/9/2019	**96**	**200**	**430**	**130**	**170**	**27**	**92**	**290**	**45**	<14	**82**	**190**	**100**	**27**	**160**	<11	**43**	**62**	**220**	**75**	**180**
DG-AC7	3.5-4	DG-AC7-3.5-4	1/9/2019	**5.3**	**2.5**	**11**	**2.8**	**19**	<3.4	<4.1	**6**	**11**	<2.8	**2.9**	**5.3**	<4.2	<3.4	**27**	<2.2	**41**	**51**	**17**	**28**	**37**
DG-AC7	7.5-8	DG-AC7-7.5-8	1/9/2019	**9.3**	**17**	**54**	**9.3**	**30**	<3.4	**14**	**27**	**16**	<2.7	**5.9**	**3.2**	**20**	<3.4	**43**	**5.8**	**42**	**49**	**41**	**9.2**	**25**
DG-AD13	0.5-1	DG-AD13-0.5-1	2/1/2019	**63**	**110**	**120**	**61**	**160**	<67	<81	**167**	<96	<54	<46	**55**	**110**	<67	**77**	<42	<67	**140**	**190**	**390**	**540**
DG-AD13	3.5-4	DG-AD13-3.5-4	2/1/2019	<150	**490**	**450**	<210	**490**	<340	<410	**735**	<490	<270	<230	**200**	**500**	<340	**190**	<210	<340	**280**	**670**	**2400**	**5900**
DG-AD13	7.5-8	DG-AD13-7.5-8	2/1/2019	**1100**	**1000**	**730**	**520**	**1700**	<680	<820	**1571**	**2400**	**860**	<470	**1500**	<840	<680	**810**	**1700**	**1100**	**3800**	**4200**	**8400**	**10000**
DG-AD13 (D)	7.5-8	DG-AD13 (D)-7.5-8	2/1/2019	**2400**	**2200**	**1500**	**690**	**4400**	<860	<1,000	**3081**	**16000**	**4000**	**860**	**3500**	**1200**	<860	**2000**	**5700**	**6900**	**13000**	**9800**	**15000**	**19000**
DG-AD17	0.5-1	DG-AD17-0.5-1	1/24/2019	<16	<16	<16	<16	**32**	<16	<16	**19**	**18**	<16	<16	<16	<16	<16	**22**	<16	<16	**27**	**34**	**170**	**300**
DG-AD17	3.5-4	DG-AD17-3.5-4	1/24/2019	**86**	**140**	**190**	**51**	**99**	**33**	**140**	**215**	<7.8	**69**	<7.8	**27**	**95**	**33**	**170**	**16**	<7.8	**15**	**130**	**22**	**7.4**
DG-AD17	7-7.5	DG-AD17-7-7.5	1/24/2019	**12**	**8.7**	**14**	**5.5**	**11**	<4.0	<4.0	**14**	<4.0	**13**	<4.0	**6.6**	**5.6**	<4.0	**88**	**6.9**	<4.0	**14**	**51**	**13**	**13**
DG-AD5	0.5-1	DG-AD5-0.5-1	1/8/2019	**51**	**64**	**80**	**37**	**92**	<14	**34**	**88**	**92**	<11	**53**	**77**	**54**	<14	**100**	**20**	**340**	**130**	**140**	**310**	**550**
DG-AD5	3.5-4	DG-AD5-3.5-4	1/8/2019	<1.5	**2.5**	**4.8**	<2.1	**3.3**	<3.4	<4.1	**5**	<4.9	<2.8	<2.4	<2.0	**4.4**	<3.4	**4.6**	<2.2	**3.6**	**3.6**	**6.3**	**15**	**35**

Table 3: Polynuclear Aromatic Hydrocarbons and Total Petroleum Hydrocarbons as Diesel and Motor Oil Concentrations in Soil
UPC OU-2
Brisbane, California

Sample Location	Depth Range (ft bgs)	Sample Name	Collection Date	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Chrysene	Dibenzo(a,h)anthracene	Indeno(1,2,3-cd)pyrene	Benzo(a)pyrene Equivalent Total PAHs [4]	2-Methylnaphthalene	Acenaphthene	Acenaphthylene	Anthracene	Benzo(g,h,i)perylene	Dibenzo(a,h)anthracene	Fluoranthene	Fluorene	Naphthalene	Phenanthrene	Pyrene	TPH-Diesel (C10-C28)	TPH-Motor Oil (C24-C36)
Direct Exposure Human Health Risk Level Residential Soil Exposure ESL [1]				1.1E+03	1.1E+02	1.1E+03	1.1E+04	1.1E+05	1.1E+02	1.1E+03	--	2.4E+05	3.6E+06	--	1.8E+07	--	1.1E+02	2.4E+06	2.4E+06	3.8E+03	--	1.8E+06	2.6E+02	1.2E+04
Leaching to Groundwater Levels Non-drinking Water ESL [2]				1.0E+04	5.7E+03	7.5E+04	3.9E+04	1.0E+04	3.9E+05	3.2E+04	--	8.8E+02	1.2E+04	6.4E+03	1.9E+03	2.7E+04	3.9E+05	8.6E+04	6.0E+03	1.2E+03	1.1E+04	4.5E+04	7.3E+03	--
Regional Background [3]				--	--	--	--	--	--	--	4.0E+02	--	--	--	--	--	--	--	--	--	--	--	--	--
Units				µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	mg/kg	mg/kg
DG-AD9	0.5-1	DG-AD9-0.5-1	1/9/2019	**120**	**180**	**260**	**91**	**190**	**24**	**84**	**252**	**120**	**21**	**56**	**110**	**110**	**24**	**220**	**12**	**130**	**150**	**250**	**510**	**1200**
DG-AD9	3.5-4	DG-AD9-3.5-4	1/9/2019	**18**	**11**	**36**	**10**	**41**	<3.3	**6.2**	**19**	**58**	**3.1**	<2.3	**27**	**8.5**	<3.3	**81**	**9.4**	**170**	**190**	**60**	**110**	**150**
DG-AE11	0.5-1	DG-AE11-0.5-1	1/21/2019	**41**	**44**	**53**	**25**	**42**	<17	<20	**63**	<24	**28**	<11	**18**	**24**	<17	**65**	**21**	<17	**73**	**71**	**170**	**130**
DG-AE11	3.5-4	DG-AE11-3.5-4	1/21/2019	**46**	**75**	**61**	<39	**85**	<66	<79	**123**	<94	<53	<45	<38	<81	<66	**52**	<41	<66	**56**	**320**	**390**	**900**
DG-AE3	0.5-1	DG-AE3-0.5-1	12/19/2018	<1.5	**2.8**	**3.6**	<2.1	<1.4	<3.5	<4.2	**5**	<5.0	<2.8	<2.4	<2.0	<4.3	<3.5	**2**	<2.2	<3.5	<1.8	**2.3**	**3**	**13**
DG-AE3	3.5-4	DG-AE3-3.5-4	12/19/2018	**34**	**47**	**60**	**21**	**45**	**10**	**35**	**70**	**23**	<2.8	**8.4**	**10**	**44**	**10**	**72**	**3.2**	**20**	**49**	**83**	**24**	**69**
DG-AE7	0.5-1	DG-AE7-0.5-1	1/9/2019	**25**	**36**	**53**	**22**	**42**	**4.4**	**15**	**50**	**5.4**	<2.6	**2.4**	**4.2**	**18**	**4.4**	**40**	<2.1	**4.9**	**18**	**42**	**21**	**47**
DG-AE7	3.5-4	DG-AE7-3.5-4	1/9/2019	**18**	**18**	**27**	**9.6**	**28**	<3.4	**6.6**	**25**	**13**	<2.7	**3.4**	**4.9**	**8.1**	<3.4	**20**	**2.9**	**14**	**23**	**30**	**27**	**140**
DG-AE7	8-8.5	DG-AE7-8-8.5	1/9/2019	**14**	**28**	**58**	**17**	**39**	**4.2**	**19**	**42**	**5.1**	<2.6	**2.3**	**3**	**26**	**4.2**	**42**	**2.3**	**15**	**47**	**52**	**6.2**	<9.7
DG-AF13	0.5-1	DG-AF13-0.5-1	11/21/2018	**1300**	**740**	**580**	<41	**2900**	**110**	**84**	**1050**	**1700**	**2700**	**580**	**2900**	**170**	**110**	**1300**	**4300**	**660**	**13000**	**4700**	**15000**	**17000**
DG-AF13	0.5-1	DG-AF13-0.5-1	1/28/2019	<300	**860**	**670**	**440**	<280	<690	<830	**1333**	<980	<550	<470	<390	<850	<690	<280	<430	<690	<350	**1000**	**1500**	**3700**
DG-AF13	3.5-4	DG-AF13-3.5-4	11/21/2018	**1200**	**740**	**600**	<100	**2600**	<170	<200	**1018**	**1000**	**2900**	**590**	**2600**	**220**	<170	**1100**	**4000**	**930**	**9800**	**4100**	**52000**	**63000**
DG-AF13	3.5-4	DG-AF13-3.5-4	1/28/2019	**24**	**39**	**52**	**21**	**24**	**8.2**	**13**	**56**	<9.8	<5.5	<4.7	**6.2**	**15**	**8.2**	**31**	<4.3	<6.9	**16**	**52**	**22**	**52**
DG-AF13	7-7.5	DG-AF13-7-7.5	11/21/2018	**36**	**36**	**51**	**19**	**64**	**5.5**	**17**	**52**	**96**	**130**	**17**	**66**	**22**	**5.5**	**180**	**88**	**500**	**250**	**160**	**190**	**140**
DG-AF5	0.5-1	DG-AF5-0.5-1	1/8/2019	**130**	**160**	**260**	**91**	**210**	**32**	**96**	**242**	**64**	**22**	**60**	**150**	**130**	**32**	**240**	**14**	**77**	**190**	**270**	**300**	**640**
DG-AF5	3.5-4	DG-AF5-3.5-4	1/8/2019	<1.5	**2.9**	**4.7**	<2.1	**3.1**	<3.4	<4.1	**5**	<4.9	<2.7	<2.4	<2.0	**4.7**	<3.4	**3.9**	<2.2	<3.4	**2.8**	**5**	**11**	**35**
DG-AG11	0.5-1	DG-AG11-0.5-1	1/21/2019	**75**	**180**	**200**	**74**	**87**	<68	<81	**246**	<97	<54	<46	<39	**150**	<68	**83**	<43	<68	**39**	**160**	**420**	**1000**
DG-AG11	3.5-4	DG-AG11-3.5-4	1/21/2019	<15	**31**	**39**	<20	**32**	<34	<41	**55**	<49	<27	<23	<20	<42	<34	**31**	<21	<34	**23**	**50**	**180**	**410**
DG-AG11	9.5-10	DG-AG11-9.5-10	1/21/2019	**790**	**510**	**260**	<200	**1400**	<340	<400	**807**	**1500**	**1900**	**370**	**1700**	<410	<340	**500**	**3500**	**1500**	**7500**	**4100**	**9500**	**8700**
DG-AG15	0.5-1	DG-AG15-0.5-1	1/24/2019	<16	<16	<16	<16	<16	<16	<16	**18**	<16	<16	<16	<16	**20**	<16	<16	<16	<16	<16	<16	**5.7**	**11**
DG-AG15	3.5-4	DG-AG15-3.5-4	1/24/2019	**47**	**43**	**59**	<39	**59**	<39	<39	**75**	<39	<39	<39	<39	**40**	<39	**67**	<39	<39	**40**	**80**	**99**	**39**
DG-AG15	8.5-9	DG-AG15-8.5-9	1/24/2019	**76**	**140**	**170**	**39**	**98**	**16**	**150**	**196**	<16	<16	<16	**20**	**140**	**16**	**160**	<16	<16	**47**	**150**	**27**	**5.5**
DG-AG3	0.5-1	DG-AG3-0.5-1	12/19/2018	**8.5**	**12**	**17**	**6.8**	**13**	**3.8**	**9.7**	**19**	<5.0	<2.8	**2.5**	**6.3**	**18**	**3.8**	**18**	<2.2	**4.3**	**9.3**	**19**	**11**	**45**
DG-AG3	3.5-4	DG-AG3-3.5-4	12/19/2018	**3.8**	**7.7**	**11**	**3.6**	**7.1**	<3.5	**4.4**	**11**	<5.0	<2.8	<2.4	<2.0	**7.4**	<3.5	**7.3**	<2.2	<3.5	**8.8**	**20**	**210**	**690**
DG-AG7	0.5-1	DG-AG7-0.5-1	1/30/2019	**15**	**24**	**35**	**11**	**24**	**4.4**	**20**	**36**	**5.7**	<3.9	**3.9**	**8.4**	**27**	**4.4**	**24**	<3.9	**6.1**	**16**	**26**	**20**	**18**
DG-AG7	3.5-4	DG-AG7-3.5-4	1/30/2019	**4.2**	**4.9**	**9.6**	<4.0	**7.5**	<4.0	<4.0	**9**	<4.0	<4.0	<4.0	<4.0	**4.1**	<4.0	**8.1**	<4.0	<4.0	**5.4**	**8.1**	**5.4**	**4.9**
DG-AH13	0.5-1	DG-AH13-0.5-1	1/29/2019	<74	<94	<100	<100	<69	<170	<210	**152**	<250	<140	<120	<98	<210	<170	<69	<110	<170	<89	<84	**670**	**2200**
DG-AH13	3.5-4	DG-AH13-3.5-4	1/29/2019	<150	<190	<210	<210	<140	<340	<410	**305**	<490	<280	<240	<200	<420	<340	<140	<220	<340	<180	<170	**2200**	**4300**
DG-AH13	7.5-8	DG-AH13-7.5-8	1/29/2019	<600	**1600**	**1600**	<830	**3800**	<1,400	<1,700	**2583**	<2,000	<1,100	**1000**	**4700**	<1,700	<1,400	**2100**	**5300**	<1,400	**2300**	**7100**	**20000**	**18000**
DG-AH17	0.5-1	DG-AH17-0.5-1	1/24/2019	**5.3**	**6.9**	**12**	**4.7**	<4.0	<4.0	<4.0	**11**	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	**9**	<4.0	<4.0	**5.6**	**11**	**3.6**	**5.2**
DG-AH4	4-4.5	DG-AH4-4-4.5	12/18/2018	**2700**	**1600**	**940**	**350**	**4200**	<350	<420	**2168**	**20000**	**3100**	**460**	**4600**	**510**	<350	**1900**	**3400**	**1100**	**14000**	**9200**	**3700**	**3600**
DG-AH4	6-6.5	DG-AH4-6-6.5	12/18/2018	**3.6**	**7.2**	**21**	**3.9**	**20**	**4.2**	**6.5**	**15**	**11**	<2.8	<2.4	**3.1**	**12**	**4.2**	**13**	<2.2	**19**	**46**	**15**	**13**	**34**
DG-AH5	0.5-1	DG-AH5-0.5-1	1/8/2019	**55**	**79**	**90**	**40**	**81**	**9.3**	**35**	**107**	**24**	**3**	**12**	**30**	**46**	**9.3**	**130**	**3.4**	**27**	**77**	**150**	**58**	**160**
DG-AH5	3.5-4	DG-AH5-3.5-4	1/8/2019	**430**	**880**	**820**	**360**	**670**	**54**	**350**	**1098**	**130**	<14	**140**	**170**	**370**	**54**	**1900**	**55**	**660**	**1500**	**2300**	**130**	**340**
DG-AH5	8-8.5	DG-AH5-8-8.5	1/8/2019	<1.5	**2.8**	**4.7**	<2.1	**3.1**	<3.4	<4.1	**5**	<4.9	<2.8	<2.4	<2.0	**5.8**	<3.4	**3.8**	<2.2	<3.4	**3.3**	**4.7**	**18**	**28**
DG-AH9	0.5-1	DG-AH9-0.5-1	1/30/2019	**22**	**30**	**41**	**15**	**28**	**5.4**	**25**	**44**	**7.4**	<3.9	**6.1**	**22**	**39**	**5.4**	**35**	<3.9	**6.3**	**21**	**34**	**9.3**	**11**
DG-AH9	3.5-4	DG-AH9-3.5-4	1/30/2019	**25**	**24**	**42**	**13**	**37**	**5.2**	**18**	**38**	**29**	<3.9	**4.7**	**16**	**18**	**5.2**	**48**	**6.8**	**36**	**50**	**36**	**13**	**13**
DG-AI11	0.5-1	DG-AI11-0.5-1	1/21/2019	<3.0	<3.8	<4.2	<4.2	<2.8	<6.9	<8.3	**6**	<9.9	<5.5	<4.8	<4.0	<8.5	<6.9	<2.8	<4.4	<6.9	<3.6	<3.4	**24**	**78**
DG-AI11 (D)	0.5-1	DG-AI11 (D)-0.5-1	1/21/2019	<2.8	**7.1**	**6.2**	**4.9**	**3**	<6.6	<7.9	**12**	<9.4	<5.3	<4.5	**4.1**	**11**	<6.6	**3.3**	<4.2	<6.6	**3.7**	**7.9**	**47**	**160**
DG-AI11	3.5-4	DG-AI11-3.5-4	1/21/2019	**330**	**440**	**200**	<100	**740**	<170	<210	**590**	<250	**520**	<120	**650**	**240**	<170	**490**	**470**	**180**	**1100**	**2200**	**10000**	**14000**
DG-AI11	9.5-10	DG-AI11-9.5-10	1/21/2019	**1900**	**850**	**280**	<210	**3400**	<340	<410	**1263**	**16000**	**2600**	**410**	**2800**	**440**	<340	**800**	**3200**	**1200**	**11000**	**6800**	**5200**	**5100**
DG-AI15	0.5-1	DG-AI15-0.5-1	1/24/2019	<79	<79	<79	<79	**170**	<79	<79	**91**	<79	<79	<79	<79	<79	<79	<79	<79	<79	<79	**110**	**370**	**150**
DG-AI15	3.5-4	DG-AI15-3.5-4	1/24/2019	<3.9	<3.9	<3.9	<3.9	<3.9	<3.9	<3.9	**5**	<3.9	<3.9	<3.9	<3.9	<3.9	<3.9	<3.9	<3.9	<3.9	<3.9	<3.9	**11**	**12**
DG-AI15 (D)	3.5-4	DG-AI15 (D)-3.5-4	1/24/2019	<3.9	<3.9	**5.3**	<3.9	**4.9**	<3.9	<3.9	**5**	<3.9	<3.9	<3.9	<3.9	<3.9	<3.9	**4.9**	<3.9	<3.9	<3.9	**8.2**	**15**	**17**
DG-AI3	0.5-1	DG-AI3-0.5-1	12/19/2018	**1.7**	**3.5**	**5.9**	**2.5**	**1.5**	<3.5	<4.2	**6**	<5.0	<2.8	<2.4	**2.3**	<4.3	<3.5	**3**	<2.2	<3.5	<1.8	**3.3**	**5.1**	**13**

Table 3: Polynuclear Aromatic Hydrocarbons and Total Petroleum Hydrocarbons as Diesel and Motor Oil Concentrations in Soil
UPC OU-2
Brisbane, California

Sample Location	Depth Range (ft bgs)	Sample Name	Collection Date	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Chrysene	Dibenzo(a,h)anthracene	Indeno(1,2,3-cd)pyrene	Benzo(a)pyrene Equivalent Total PAHs [4]	2-Methylnaphthalene	Acenaphthene	Acenaphthylene	Anthracene	Benzo(g,h,i)perylene	Dibenzo(a,h)anthracene	Fluoranthene	Fluorene	Naphthalene	Phenanthrene	Pyrene	TPH-Diesel (C10-C28)	TPH-Motor Oil (C24-C36)
Direct Exposure Human Health Risk Level Residential Soil Exposure ESL [1]				1.1E+03	1.1E+02	1.1E+03	1.1E+04	1.1E+05	1.1E+02	1.1E+03	--	2.4E+05	3.6E+06	--	1.8E+07	--	1.1E+02	2.4E+06	2.4E+06	3.8E+03	--	1.8E+06	2.6E+02	1.2E+04
Leaching to Groundwater Levels Non-drinking Water ESL [2]				1.0E+04	5.7E+03	7.5E+04	3.9E+04	1.0E+04	3.9E+05	3.2E+04	--	8.8E+02	1.2E+04	6.4E+03	1.9E+03	2.7E+04	3.9E+05	8.6E+04	6.0E+03	1.2E+03	1.1E+04	4.5E+04	7.3E+03	--
Regional Background [3]				--	--	--	--	--	--	--	4.0E+02	--	--	--	--	--	--	--	--	--	--	--	--	--
Units				µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	mg/kg	mg/kg
DG-AI3	3.5-4	DG-AI3-3.5-4	12/19/2018	**3.4**	**5.5**	**35**	**4.3**	**32**	**5.1**	**5.8**	**15**	**55**	<2.7	<2.3	**7.4**	**14**	**5.1**	**9**	**19**	**7.6**	**55**	**22**	**20**	**47**
DG-AI3 (D)	3.5-4	DG-AI3 (D)-3.5-4	12/19/2018	**7.7**	**9.4**	**36**	**6.2**	**32**	**5.4**	**10**	**20**	**54**	**3.1**	**2.4**	**10**	**20**	**5.4**	**17**	**20**	**14**	**56**	**28**	**38**	**74**
DG-AI7	0.5-1	DG-AI7-0.5-1	1/9/2019	**350**	**440**	**690**	**210**	**600**	**51**	**150**	**613**	**85**	**32**	**41**	**120**	**180**	**51**	**640**	**28**	**80**	**420**	**770**	**440**	**980**
DG-AI7	3.5-4	DG-AI7-3.5-4	1/9/2019	**20**	**9.2**	**21**	**7.8**	**35**	<3.3	**7**	**16**	**15**	<2.7	<2.3	**5.8**	**10**	<3.3	**24**	**2.5**	**14**	**16**	**27**	**25**	**75**
DG-AI7	8-8.5	DG-AI7-8-8.5	1/9/2019	**660**	**800**	**990**	**400**	**800**	**76**	**230**	**1069**	**250**	**41**	**70**	**260**	**220**	**76**	**980**	**110**	**510**	**1000**	**1200**	**220**	**330**
DG-AJ13	0.5-1	DG-AJ13-0.5-1	1/29/2019	<74	**240**	**200**	**150**	<69	<170	<210	**361**	<250	<140	<120	<99	**250**	<170	<69	<110	<170	<89	**130**	**3300**	**8200**
DG-AJ13	3.5-4	DG-AJ13-3.5-4	1/29/2019	<7.3	**17**	**15**	**13**	**7**	<17	<21	**29**	<24	<14	<12	<9.8	<21	<17	**9.5**	<11	<17	<8.8	**20**	**130**	**280**
DG-AJ17	0.5-1	DG-AJ17-0.5-1	1/24/2019	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	**5**	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	**5.4**	**11**
DG-AJ17	3.5-4	DG-AJ17-3.5-4	1/24/2019	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	**5**	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<2.5	**3.1**
DG-AJ17	9.5-10	DG-AJ17-9.5-10	1/24/2019	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	**5**	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<2.5	<2.5
DG-AJ5	0.5-1	DG-AJ5-0.5-1	1/8/2019	**44**	**64**	**100**	**42**	**77**	**11**	**29**	**93**	**17**	**6.6**	**18**	**38**	**37**	**11**	**76**	<4.3	**18**	**44**	**79**	**51**	**160**
DG-AJ5	3.5-4	DG-AJ5-3.5-4	1/8/2019	**380**	**430**	**610**	**250**	**610**	**36**	**120**	**580**	**670**	**81**	**100**	**260**	**130**	**36**	**960**	**100**	**630**	**1000**	**1100**	**600**	**1600**
DG-AJ9	0.5-1	DG-AJ9-0.5-1	1/30/2019	**40**	**44**	**67**	**20**	**60**	**7.8**	**37**	**66**	**18**	**4.1**	**12**	**28**	**57**	**7.8**	**86**	**4.8**	**20**	**66**	**88**	**71**	**73**
DG-AJ9	3.5-4	DG-AJ9-3.5-4	1/30/2019	**13**	**8.3**	**22**	**5.9**	**24**	<3.9	**7**	**15**	**34**	<3.9	<3.9	**12**	**8.3**	<3.9	**23**	**5.6**	**26**	**36**	**18**	**7.1**	**8.4**
DG-AK11	0.5-1	DG-AK11-0.5-1	1/22/2019	**66**	**150**	**110**	**85**	**180**	<140	<170	**247**	**550**	<110	<94	**210**	<170	<140	**82**	**160**	<140	**590**	**390**	**460**	**510**
DG-AK11	3.5-4	DG-AK11-3.5-4	1/22/2019	**3300**	**4200**	**3800**	<2,000	**6300**	<3,300	<4,000	**6776**	<4,700	<2,700	<2,300	**5600**	<4,100	<3,300	**2700**	**3000**	<3,300	**6500**	**16000**	**34000**	**38000**
DG-AK15	0.5-1	DG-AK15-0.5-1	1/23/2019	**17**	**20**	**32**	**9.2**	**30**	**4.5**	**12**	**31**	**9.6**	<3.9	**4**	**3.9**	**12**	**4.5**	**35**	<3.9	**11**	**61**	**36**	**14**	**20**
DG-AK15	3.5-4	DG-AK15-3.5-4	1/23/2019	**230**	**140**	**390**	**83**	**600**	<78	<78	**246**	<78	<78	**190**	**89**	<78	<78	**590**	<78	<78	**150**	**850**	**140**	**93**
DG-AK3	0.5-1	DG-AK3-0.5-1	12/19/2018	**2.6**	**3.7**	**5.6**	**2.5**	**2.6**	<3.5	<4.2	**7**	**6**	<2.8	<2.4	<2.0	<4.3	<3.5	**3.6**	<2.2	**3.5**	**5.2**	**3.4**	**14**	**32**
DG-AK3	3.5-4	DG-AK3-3.5-4	12/19/2018	**260**	**290**	**350**	**110**	**280**	**42**	**110**	**405**	**150**	**18**	**83**	**110**	**120**	**42**	**410**	**43**	**120**	**400**	**490**	**27**	**45**
DG-AK7	0.5-1	DG-AK7-0.5-1	1/9/2019	**200**	**280**	**430**	**180**	**310**	**35**	**100**	**390**	**45**	**15**	**29**	**53**	**120**	**35**	**310**	**12**	**45**	**210**	**370**	**200**	**360**
DG-AK7	3.5-4	DG-AK7-3.5-4	1/9/2019	**7.1**	**4.8**	**11**	**3.4**	**12**	<3.4	<4.1	**9**	**22**	<2.7	**3.2**	**5.9**	<4.2	<3.4	**19**	**2.9**	**26**	**33**	**18**	**36**	**72**
DG-AK7 (D)	3.5-4	DG-AK7 (D)-3.5-4	1/9/2019	**8**	**5.7**	**12**	**3.5**	**13**	<3.4	<4.0	**10**	**46**	<2.7	**2.5**	**5.1**	<4.1	<3.4	**12**	**2.1**	**35**	**21**	**14**	**17**	**56**
DG-AL13	0.5-1	DG-AL13-0.5-1	1/29/2019	**20**	**26**	**43**	**18**	**17**	**7.5**	**13**	**41**	<9.8	<5.5	**7**	**8.6**	**18**	**7.5**	**30**	<4.3	<6.9	**9.1**	**39**	**60**	**170**
DG-AL13	3.5-4	DG-AL13-3.5-4	1/29/2019	<1.5	**4.7**	**4.7**	**2.7**	**2.5**	<3.5	<4.2	**7**	<5.0	<2.8	<2.4	**2.2**	**5.1**	<3.5	**3.8**	<2.2	<3.5	<1.8	**6.3**	**6.3**	**17**
DG-AL5	0.5-1	DG-AL5-0.5-1	1/30/2019	**26**	**28**	**45**	**14**	**34**	**5.3**	**25**	**43**	**32**	<3.9	**16**	**46**	**35**	**5.3**	**47**	**3.9**	**63**	**49**	**42**	**15**	**21**
DG-AL5	3.5-4	DG-AL5-3.5-4	1/30/2019	**60**	**74**	**140**	**42**	**130**	**17**	**59**	**117**	**28**	<16	**22**	**68**	**93**	**17**	**110**	<16	**38**	**76**	**130**	**110**	**200**
DG-AL5 (D)	3.5-4	DG-AL5 (D)-3.5-4	1/30/2019	**23**	**26**	**44**	**14**	**41**	<8.0	**20**	**39**	**19**	<8.0	**11**	**31**	**35**	<8.0	**51**	<8.0	**21**	**44**	**51**	**38**	**64**
DG-AL9	0.5-1	DG-AL9-0.5-1	1/21/2019	**40**	**54**	**78**	**25**	**62**	**9.9**	**34**	**79**	**9.7**	**3**	**4.6**	**12**	**60**	**9.9**	**65**	<2.1	**10**	**28**	**69**	**36**	**91**
DG-AL9	3.5-4	DG-AL9-3.5-4	1/21/2019	**18**	**13**	**34**	**8.2**	**36**	**6**	**10**	**25**	**59**	**2.7**	**6.6**	**12**	**14**	**6**	**38**	**4.3**	**82**	**64**	**47**	**53**	**98**
DG-AL9	7-7.5	DG-AL9-7-7.5	1/21/2019	**3.4**	**6.5**	**59**	**4.7**	**36**	**5.3**	**6.3**	**19**	<4.8	<2.7	<2.3	**3.8**	**7.1**	**5.3**	**20**	**3.1**	**6.7**	**60**	**29**	**1.4**	<9.5
DG-AL9 (D)	7-7.5	DG-AL9 (D)-7-7.5	1/21/2019	**3.5**	**8.5**	**71**	**5.3**	**35**	**5**	**6.6**	**22**	<4.8	<2.7	<2.3	**3**	**7.5**	**5**	**22**	<2.1	**4.4**	**35**	**30**	**2.7**	<9.7
DG-AM11	0.5-1	DG-AM11-0.5-1	1/22/2019	<1.5	**3.1**	**2.6**	**2.3**	<1.4	<3.4	<4.1	**5**	<4.9	<2.8	<2.4	<2.0	**4.2**	<3.4	**1.5**	<2.2	<3.4	**2.4**	**3.9**	**22**	**79**
DG-AM11	3.5-4	DG-AM11-3.5-4	1/22/2019	<150	<190	<210	<210	<140	<350	<420	**310**	<500	<280	<240	<200	<430	<350	<140	<220	<350	<180	**200**	**1600**	**3300**
DG-AM15	0.5-1	DG-AM15-0.5-1	1/23/2019	**9.1**	**8.4**	**16**	**4.6**	**12**	<4.0	**4.7**	**13**	**8.4**	<4.0	<4.0	<4.0	**4.9**	<4.0	**16**	<4.0	**11**	**15**	**15**	**8.3**	**13**
DG-AM15	3.5-4	DG-AM15-3.5-4	1/23/2019	**39**	**49**	**62**	**21**	**48**	**7.4**	**25**	**69**	<3.9	<3.9	**7.5**	**9.8**	**24**	**7.4**	**54**	<3.9	<3.9	**23**	**67**	**16**	**18**
DG-AM15	9.5-10	DG-AM15-9.5-10	1/23/2019	<3.9	<3.9	**4.2**	<3.9	**6.7**	<3.9	<3.9	**5**	<3.9	<3.9	<3.9	<3.9	<3.9	<3.9	**6.4**	<3.9	<3.9	**4.1**	**20**	**20**	**14**
DG-AM15 (D)	9.5-10	DG-AM15 (D)-9.5-10	1/23/2019	**4.1**	<3.9	**4.8**	<3.9	**5.2**	<3.9	<3.9	**5**	<3.9	<3.9	<3.9	<3.9	<3.9	<3.9	**7.4**	<3.9	<3.9	<3.9	**18**	**5.1**	**4.1**
DG-AM3	0.5-1	DG-AM3-0.5-1	12/19/2018	**160**	**350**	**390**	**160**	**240**	**210**	**1100**	**727**	<99	<56	**550**	**550**	**3100**	**210**	**150**	<44	<70	**98**	**210**	**310**	**780**
DG-AM3	3.5-4	DG-AM3-3.5-4	12/19/2018	**12**	**15**	**33**	**8.6**	**27**	**5.4**	**12**	**26**	**31**	<2.8	**3.3**	**6.5**	**17**	**5.4**	**22**	<2.2	**23**	**29**	**31**	**65**	**130**
DG-AM7	0.5-1	DG-AM7-0.5-1	1/9/2019	**210**	**260**	**360**	**160**	**240**	**25**	**85**	**352**	**54**	**16**	**93**	**120**	**120**	**25**	**300**	**13**	**66**	**190**	**570**	**170**	**440**
DG-AM7	3.5-4	DG-AM7-3.5-4	1/9/2019	**6.6**	**5.2**	**14**	**5**	**13**	<3.4	**7.1**	**10**	**27**	<2.7	**2.4**	**7.9**	**11**	<3.4	**14**	**3.8**	**25**	**26**	**12**	**16**	**66**
DG-AM7	7.5-8	DG-AM7-7.5-8	1/9/2019	**13**	**40**	**66**	**18**	**30**	**16**	**55**	**70**	**55**	<2.8	**5.5**	**9.2**	**80**	**16**	**34**	**11**	**90**	**88**	**39**	**42**	**67**
DG-AN13	0.5-1	DG-AN13-0.5-1	1/31/2019	<730	<930	<1,000	<1,000	<690	<1,700	<2,100	**1512**	<2,400	<1,400	<1,200	<980	<2,100	<1,700	**700**	<1,100	<1,700	<880	**1300**	**3400**	**6700**
DG-AN13	3.5-4	DG-AN13-3.5-4	1/31/2019	<1.5	**6.4**	**9.5**	<2.1	**3.6**	<3.4	**4.7**	**10**	<4.9	<2.8	<2.4	**2**	**5.9**	<3.4	**9.5**	<2.2	<3.4	**4.7**	**13**	**26**	**33**

Table 3: Polynuclear Aromatic Hydrocarbons and Total Petroleum Hydrocarbons as Diesel and Motor Oil Concentrations in Soil
UPC OU-2
Brisbane, California

Sample Location	Depth Range (ft bgs)	Sample Name	Collection Date	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Chrysene	Dibenzo(a,h)anthracene	Indeno(1,2,3-cd)pyrene	Benzo(a)pyrene Equivalent Total PAHs [4]	2-Methylnaphthalene	Acenaphthene	Acenaphthylene	Anthracene	Benzo(g,h,i)perylene	Dibenzo(a,h)anthracene	Fluoranthene	Fluorene	Naphthalene	Phenanthrene	Pyrene	TPH-Diesel (C10-C28)	TPH-Motor Oil (C24-C36)
Direct Exposure Human Health Risk Level Residential Soil Exposure ESL [1]				1.1E+03	1.1E+02	1.1E+03	1.1E+04	1.1E+05	1.1E+02	1.1E+03	--	2.4E+05	3.6E+06	--	1.8E+07	--	1.1E+02	2.4E+06	2.4E+06	3.8E+03	--	1.8E+06	2.6E+02	1.2E+04
Leaching to Groundwater Levels Non-drinking Water ESL [2]				1.0E+04	5.7E+03	7.5E+04	3.9E+04	1.0E+04	3.9E+05	3.2E+04	--	8.8E+02	1.2E+04	6.4E+03	1.9E+03	2.7E+04	3.9E+05	8.6E+04	6.0E+03	1.2E+03	1.1E+04	4.5E+04	7.3E+03	--
Regional Background [3]				--	--	--	--	--	--	--	4.0E+02	--	--	--	--	--	--	--	--	--	--	--	--	--
Units				µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	mg/kg	mg/kg
DG-AN13	9.5-10	DG-AN13-9.5-10	1/31/2019	<15	**38**	**67**	**34**	**36**	<34	<41	**65**	**280**	**88**	**120**	**53**	<42	<34	**120**	**34**	**4900**	**330**	**160**	**54**	**31**
DG-AN5	0.5-1	DG-AN5-0.5-1	12/20/2018	**11**	**13**	**20**	**6.7**	**11**	<3.5	**6.1**	**19**	<5.0	<2.8	<2.4	**4.2**	**7.3**	<3.5	**23**	<2.2	**4.4**	**15**	**20**	**13**	**41**
DG-AN5	3.5-4	DG-AN5-3.5-4	12/20/2018	**2**	**3.6**	**4.7**	**2.5**	**2**	<3.5	<4.2	**6**	<5.0	<2.8	<2.4	<2.0	<4.3	<3.5	**4.1**	<2.2	<3.5	**2.9**	**4.4**	**15**	**36**
DG-AN9	0.5-1	DG-AN9-0.5-1	1/21/2019	**44**	**75**	**91**	**29**	**46**	**14**	**39**	**107**	**15**	**4**	**5.7**	**13**	**60**	**14**	**48**	<2.1	**13**	**26**	**59**	**43**	**91**
DG-AN9	3.5-4	DG-AN9-3.5-4	1/21/2019	<1.5	**2.8**	**3.5**	**2.5**	<1.4	<3.5	<4.2	**5**	<4.9	<2.8	<2.4	<2.0	<4.3	<3.5	**2.5**	<2.2	<3.5	<1.8	**2.9**	**0.92**	<9.7
DG-AN9	7-7.5	DG-AN9-7-7.5	1/21/2019	<1.4	**3**	**31**	**3.5**	**20**	**4.2**	<4.0	**11**	<4.8	<2.7	<2.3	**3.3**	**4.1**	**4.2**	**11**	**2.3**	**5.1**	**46**	**9.5**	**2**	<9.5
DG-AO11	0.5-1	DG-AO11-0.5-1	1/22/2019	<73	**230**	**250**	**140**	**69**	<170	<200	**355**	<240	<140	<120	<97	<210	<170	**120**	<110	<170	<87	**240**	**370**	**970**
DG-AO11	3.5-4	DG-AO11-3.5-4	1/22/2019	**240**	**490**	**390**	<210	**660**	<350	<420	**751**	<500	<280	<240	**720**	<430	<350	**340**	<220	<350	<180	**1700**	**14000**	**15000**
DG-AO3	0.5-1	DG-AO3-0.5-1	12/19/2018	**23**	**28**	**60**	**22**	**37**	**7**	**15**	**45**	**40**	<2.8	**11**	**19**	**17**	**7**	**52**	<2.2	**40**	**39**	**53**	**42**	**89**
DG-AO3	3.5-4	DG-AO3-3.5-4	12/19/2018	**7.9**	**8.6**	**29**	**4.9**	**23**	**5.5**	**8**	**19**	**16**	<2.8	**2.5**	**6.8**	**12**	**5.5**	**18**	**2.5**	**12**	**30**	**27**	**23**	**47**
DG-AO7	0.5-1	DG-AO7-0.5-1	1/9/2019	**93**	**140**	**160**	**72**	**140**	**25**	**87**	**200**	**20**	**29**	**23**	**35**	**120**	**25**	**170**	**7.1**	**20**	**97**	**200**	**38**	**110**
DG-AO7	3.5-4	DG-AO7-3.5-4	1/9/2019	**7.7**	**9.6**	**15**	**5.8**	**12**	<3.4	**6.2**	**14**	**13**	<2.7	<2.3	**2.6**	**8.2**	<3.4	**13**	<2.1	**9.4**	**8.8**	**12**	**44**	**150**
DG-AP13	0.5-1	DG-AP13-0.5-1	1/23/2019	**23**	**27**	**34**	**10**	**39**	<8.0	**18**	**39**	<8.0	<8.0	<8.0	<8.0	**23**	<8.0	**63**	<8.0	<8.0	**53**	**78**	**130**	**270**
DG-AP13 (D)	0.5-1	DG-AP13 (D)-0.5-1	1/23/2019	**11**	**15**	**20**	**5.8**	**17**	<3.9	**9.5**	**21**	<3.9	<3.9	<3.9	<3.9	**11**	<3.9	**29**	<3.9	**4**	**17**	**36**	**40**	**69**
DG-AP13	3.5-4	DG-AP13-3.5-4	1/23/2019	<4.0	<4.0	**4.5**	<4.0	**5.2**	<4.0	<4.0	**5**	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	**8.1**	<4.0	**6.7**	**5.9**	**8.9**	**11**	**17**
DG-AP13	9.5-10	DG-AP13-9.5-10	1/23/2019	<4.0	<4.0	<4.0	<4.0	**4.5**	<4.0	<4.0	**5**	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	**5.2**	<4.0	**8**	**17**	<4.0	**10**	**8**
DG-AP5	0.5-1	DG-AP5-0.5-1	12/20/2018	**16**	**19**	**33**	**11**	**21**	**4.2**	**8.9**	**29**	**340**	**3.4**	**7.4**	**13**	**12**	**4.2**	**33**	<2.2	**240**	**66**	**35**	**70**	**220**
DG-AP5	3.5-4	DG-AP5-3.5-4	12/20/2018	**5.6**	**6.7**	**8.8**	**3.9**	**4.6**	<3.5	**4.4**	**10**	<5.0	<2.8	<2.4	<2.0	**6**	<3.5	**7.6**	<2.2	<3.5	**4.4**	**8.2**	**5.3**	**11**
DG-AP9	0.5-1	DG-AP9-0.5-1	1/21/2019	**6.9**	**7.5**	**12**	**4.7**	**6.2**	**3.8**	**5.6**	**14**	<4.8	<2.7	<2.3	**3.2**	**6.2**	**3.8**	**11**	<2.1	<3.4	**5.7**	**10**	**11**	**27**
DG-AP9	3.5-4	DG-AP9-3.5-4	1/21/2019	<1.5	**2.8**	**4.4**	**2.6**	**1.7**	<3.4	<4.1	**5**	<4.9	<2.7	<2.4	<2.0	<4.2	<3.4	**3.2**	<2.2	<3.4	**2.9**	**4**	**2.6**	<9.9
DG-AQ11	0.5-1	DG-AQ11-0.5-1	1/30/2019	**13**	**16**	**28**	**9**	**21**	<3.9	**12**	**23**	<3.9	<3.9	<3.9	**4.3**	**9.2**	**17**	<3.9	**24**	<3.9	**6.1**	**17**	**25**	**48**	**91**
DG-AQ11	3.5-4	DG-AQ11-3.5-4	1/30/2019	<4.0	<4.0	<4.0	<4.0	**4.6**	<4.0	<4.0	**5**	<4.0	<4.0	<4.0	<4.0	**4.7**	<4.0	<4.0	<4.0	**6.1**	**5.9**	<4.0	**6.5**	**7.6**
DG-AQ3	0.5-1	DG-AQ3-0.5-1	12/19/2018	<1.5	**3.5**	**4.1**	**2.1**	**1.5**	<3.5	<4.2	**6**	<5.0	<2.8	<2.4	<2.0	<4.3	<3.5	**2.4**	<2.2	<3.5	<1.8	**4.5**	**3**	**11**
DG-AQ3	3.5-4	DG-AQ3-3.5-4	12/19/2018	**30**	**24**	**54**	**11**	**54**	**10**	**14**	**44**	**5.6**	**6.3**	<2.4	**16**	**18**	**10**	**58**	**5.8**	**5.2**	**79**	**80**	**5.5**	**15**
DG-AQ7	0.5-1	DG-AQ7-0.5-1	1/30/2019	**7.1**	**6.6**	**11**	<3.9	**11**	<3.9	<3.9	**11**	**65**	<3.9	<3.9	<3.9	**4.9**	<3.9	**11**	<3.9	**49**	**20**	**14**	**6.2**	**6.5**
DG-AQ7	3.5-4	DG-AQ7-3.5-4	1/30/2019	**7.1**	**5.2**	**12**	<3.9	**14**	<3.9	**4.3**	**10**	**27**	<3.9	<3.9	<3.9	**4.8**	<3.9	**16**	<3.9	**25**	**24**	**14**	**7.4**	**9.3**
DG-AR13	0.5-1	DG-AR13-0.5-1	1/23/2019	**110**	**180**	**210**	**66**	**140**	<40	**140**	**247**	<40	<40	<40	<40	**170**	<40	**320**	<40	<40	**160**	**380**	**48**	**120**
DG-AR13	3.5-4	DG-AR13-3.5-4	1/23/2019	**19**	**19**	**26**	**7.8**	**21**	**4**	**10**	**29**	<4.0	<4.0	<4.0	<4.0	**10**	**4**	**30**	<4.0	<4.0	**13**	**38**	**14**	**23**
DG-AR13	9.5-10	DG-AR13-9.5-10	1/23/2019	<3.9	**5.2**	**16**	<3.9	**9.5**	<3.9	**17**	**11**	<3.9	<3.9	<3.9	<3.9	**20**	<3.9	**9.3**	<3.9	**11**	**10**	**6.2**	**3.8**	**4.1**
DG-AR5	0.5-1	DG-AR5-0.5-1	12/20/2018	<1.5	**2.2**	**3.1**	<2.1	<1.4	<3.5	<4.2	**5**	<5.0	<2.8	<2.4	<2.0	<4.3	<3.5	**2.5**	<2.2	<3.5	**2.7**	**2.7**	**1.5**	<10
DG-AR5	3.5-4	DG-AR5-3.5-4	12/20/2018	**23**	**31**	**39**	**16**	**26**	**6.3**	**14**	**45**	**5.2**	<2.8	**6.5**	**7.5**	**15**	**6.3**	**35**	**2.6**	**5.1**	**21**	**42**	**16**	**43**
DG-AR9	0.5-1	DG-AR9-0.5-1	1/9/2019	**71**	**84**	**150**	**45**	**110**	<17	**57**	**121**	**39**	<13	**58**	**120**	**99**	<17	**110**	<11	**58**	**70**	**130**	**180**	**440**
DG-AR9	3.5-4	DG-AR9-3.5-4	1/9/2019	**4.3**	**4.3**	**10**	**3.3**	**11**	<3.4	<4.1	**8**	<4.8	<2.7	<2.3	**3.2**	**4.8**	<3.4	**8.6**	<2.1	**5.8**	**9.9**	**8.4**	**15**	**52**
DG-AR9 (D)	3.5-4	DG-AR9 (D)-3.5-4	1/9/2019	**4.8**	**6.8**	**12**	**4.6**	**8.9**	<3.3	<4.0	**10**	<4.8	<2.7	<2.3	**2.4**	**6**	<3.3	**8.4**	<2.1	**3.9**	**8.4**	**9.5**	**47**	**240**
DG-AS11	0.5-1	DG-AS11-0.5-1	1/31/2019	<150	**460**	**590**	**300**	**190**	<340	<410	**720**	<490	<280	<240	<200	**510**	<340	**400**	<220	<340	**190**	**460**	**2000**	**2700**
DG-AS11	3.5-4	DG-AS11-3.5-4	1/31/2019	**130**	**120**	**240**	**72**	**130**	**43**	**82**	**209**	<49	<27	<23	**29**	**90**	**43**	**220**	<21	**54**	**90**	**190**	**53**	**76**
DG-AS11	7.5-8	DG-AS11-7.5-8	1/31/2019	<1.5	**2.7**	**6**	**2.8**	**4.1**	<3.5	<4.2	**5**	<4.9	<2.8	<2.4	<2.0	<4.2	<3.5	**6.1**	<2.2	**7.4**	**11**	**4.4**	**11**	**11**
DG-AS3	0.5-1	DG-AS3-0.5-1	12/20/2018	**9.3**	**12**	**19**	**7.4**	**12**	**4**	**9.4**	**20**	**6.8**	<2.8	**2.5**	**5.6**	**11**	**4**	**16**	<2.2	**5.6**	**9.9**	**15**	**24**	**60**
DG-AS3 (D)	0.5-1	DG-AS3 (D)-0.5-1	12/20/2018	**15**	**16**	**26**	**11**	**19**	**4.1**	**9.9**	**25**	**11**	<2.8	**2.9**	**7.5**	**11**	**4.1**	**27**	<2.2	**12**	**18**	**25**	**25**	**65**
DG-AS3	3.5-4	DG-AS3-3.5-4	12/20/2018	**270**	**400**	**360**	**180**	**260**	**110**	**230**	**598**	**98**	**26**	**30**	**180**	**240**	**110**	**430**	**40**	**74**	**370**	**530**	**110**	**240**
DG-AS3	4.5-5	DG-AS3-4.5-5	12/20/2018	**6.5**	**16**	**25**	**8.5**	**13**	<6.9	<8.2	**23**	<9.8	<5.5	**5**	**4.4**	**9.1**	<6.9	**8.5**	<4.3	**15**	**18**	**52**	**160**	**230**
DG-AS7	0.5-1	DG-AS7-0.5-1	1/9/2019	**12000**	**7900**	**13000**	**5000**	**14000**	**980**	**2200**	**11664**	<190	**1000**	**130**	**3800**	**2000**	**980**	**29000**	**1000**	<140	**25000**	**26000**	**120**	**310**
DG-AS7	3.5-4	DG-AS7-3.5-4	1/9/2019	**1.6**	**1.9**	**2.9**	<2.0	**3.6**	<3.4	<4.1	**4**	**6.7**	<2.7	<2.3	<1.9	<4.2	<3.4	**4.7**	<2.1	**5**	**8.8**	**4.4**	**8.4**	**23**
DG-AT12	0.5-1	DG-AT12-0.5-1	1/23/2019	**44**	**48**	**65**	**22**	**80**	**8.4**	**43**	**72**	**8.8**	<8.0	**8.8**	**11**	**52**	**8.4**	**99**	**11**	<8.0	**88**	**110**	**56**	**54**
DG-AT12	3.5-4	DG-AT12-3.5-4	1/23/2019	**870**	**840**	**1100**	**410**	**1100**	**140**	**640**	**1246**	**13**	**17**	**56**	**130**	**670**	**140**	**1200**	**22**	**19**	**500**	**1400**	**390**	**300**

Table 3: Polynuclear Aromatic Hydrocarbons and Total Petroleum Hydrocarbons as Diesel and Motor Oil Concentrations in Soil
UPC OU-2
Brisbane, California

Sample Location	Depth Range (ft bgs)	Sample Name	Collection Date	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Chrysene	Dibenzo(a,h)anthracene	Indeno(1,2,3-cd)pyrene	Benzo(a)pyrene Equivalent Total PAHs [4]	2-Methylnaphthalene	Acenaphthene	Acenaphthylene	Anthracene	Benzo(g,h,i)perylene	Dibenzo(a,h)anthracene	Fluoranthene	Fluorene	Naphthalene	Phenanthrene	Pyrene	TPH-Diesel (C10-C28)	TPH-Motor Oil (C24-C36)
Direct Exposure Human Health Risk Level Residential Soil Exposure ESL [1]				1.1E+03	1.1E+02	1.1E+03	1.1E+04	1.1E+05	1.1E+02	1.1E+03	--	2.4E+05	3.6E+06	--	1.8E+07	--	1.1E+02	2.4E+06	2.4E+06	3.8E+03	--	1.8E+06	2.6E+02	1.2E+04
Leaching to Groundwater Levels Non-drinking Water ESL [2]				1.0E+04	5.7E+03	7.5E+04	3.9E+04	1.0E+04	3.9E+05	3.2E+04	--	8.8E+02	1.2E+04	6.4E+03	1.9E+03	2.7E+04	3.9E+05	8.6E+04	6.0E+03	1.2E+03	1.1E+04	4.5E+04	7.3E+03	--
Regional Background [3]				--	--	--	--	--	--	--	4.0E+02	--	--	--	--	--	--	--	--	--	--	--	--	--
Units				µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	mg/kg	mg/kg
DG-AT12	9.5-10	DG-AT12-9.5-10	1/23/2019	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	**5**	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	**5.8**	**4.8**
DG-AT5	0.5-1	DG-AT5-0.5-1	12/20/2018	<1.5	**2.3**	**2.9**	<2.1	<1.4	<3.5	<4.2	**5**	<5.0	<2.8	<2.4	<2.0	<4.3	<3.5	<1.4	<2.2	<3.5	<1.8	<1.7	**3**	**11**
DG-AT5	3.5-4	DG-AT5-3.5-4	12/20/2018	**220**	**240**	**280**	**97**	**260**	**45**	**120**	**348**	**13**	**11**	**43**	**37**	**110**	**45**	**350**	**14**	**21**	**230**	**470**	**16**	**42**
DG-AT9	0.5-1	DG-AT9-0.5-1	1/30/2019	**36**	**47**	**79**	**24**	**48**	**8.7**	**36**	**71**	**16**	<3.9	**12**	**25**	**42**	**8.7**	**55**	<3.9	**13**	**36**	**59**	**17**	**25**
DG-AT9	3.5-4	DG-AT9-3.5-4	1/30/2019	<4.0	<4.0	**6.8**	<4.0	**7**	<4.0	<4.0	**5**	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	**4.3**	<4.0	**6.6**	**6.3**	<4.0	**8.4**	**7.5**
DG-AU11	0.5-1	DG-AU11-0.5-1	1/23/2019	**8.6**	**10**	**18**	**5.2**	**14**	<3.9	**6.5**	**15**	<3.9	<3.9	<3.9	<3.9	**7.8**	<3.9	**16**	<3.9	<3.9	**7.9**	**17**	**33**	**83**
DG-AU11	3.5-4	DG-AU11-3.5-4	1/23/2019	**280**	**240**	**400**	**160**	**360**	**33**	**130**	**356**	**6.8**	**12**	**43**	**42**	**100**	**33**	**380**	**13**	**10**	**160**	**340**	**26**	**39**
DG-AU11	9.5-10	DG-AU11-9.5-10	1/23/2019	**110**	**120**	**170**	**64**	**130**	**25**	**84**	**182**	**4.6**	<4.0	<4.0	<4.0	**67**	**25**	**120**	<4.0	**36**	**47**	**120**	**16**	**9.3**
DG-AU3	0.5-1	DG-AU3-0.5-1	12/20/2018	**90**	**160**	**240**	**89**	**120**	**23**	**59**	**223**	**15**	<5.6	**24**	**41**	**62**	**23**	**49**	<4.4	**21**	**29**	**58**	**41**	**110**
DG-AU3	3.5-4	DG-AU3-3.5-4	12/20/2018	**68**	**98**	**110**	**48**	**87**	**19**	**58**	**141**	**45**	**5.1**	**13**	**17**	**69**	**19**	**83**	**13**	**23**	**91**	**110**	**140**	**160**
DG-AU7	0.5-1	DG-AU7-0.5-1	1/9/2019	**17**	**27**	**44**	**16**	**25**	**4.7**	**16**	**40**	**15**	**2.8**	**18**	**54**	**26**	**4.7**	**33**	**2.4**	**22**	**28**	**38**	**94**	**360**
DG-AU7 (D)	0.5-1	DG-AU7 (D)-0.5-1	1/9/2019	**43**	**50**	**83**	**34**	**56**	<16	**34**	**74**	**34**	<13	**31**	**88**	**49**	<16	**74**	<10	**59**	**58**	**71**	**110**	**280**
DG-AU7	3.5-4	DG-AU7-3.5-4	1/9/2019	**5.7**	**3.6**	**18**	**4.1**	**20**	<3.4	<4.1	**8**	**13**	<2.8	<2.4	**7.3**	<4.2	<3.4	**29**	<2.2	**42**	**63**	**18**	**31**	**52**
DG-AV5	0.5-1	DG-AV5-0.5-1	12/20/2018	**120**	**130**	**210**	**89**	**150**	**20**	**59**	**190**	**110**	**8.7**	**34**	**92**	**120**	**20**	**210**	**6.8**	**87**	**160**	**220**	**120**	**280**
DG-AV5 (D)	0.5-1	DG-AV5 (D)-0.5-1	12/20/2018	**1000**	**970**	**1200**	**520**	**1100**	**120**	**450**	**1361**	**140**	**430**	**84**	**640**	**470**	**120**	**2000**	**370**	**150**	**2100**	**2200**	**330**	**580**
DG-AV5	3.5-4	DG-AV5-3.5-4	12/20/2018	**6.6**	**5.7**	**10**	**4.1**	**7**	<3.5	<4.2	**9**	<5.0	<2.8	**2.8**	**6.5**	**7.4**	<3.5	**13**	<2.2	**8.5**	**4.3**	**11**	**5.8**	**22**
DG-AV5	7.5-8	DG-AV5-7.5-8	12/20/2018	**2**	**4.6**	**43**	**4**	**25**	**3.9**	<4.1	**13**	<4.9	<2.8	<2.4	<2.0	**5.5**	**3.9**	**9.5**	<2.2	**5**	**31**	**8.1**	**3.9**	<10
DG-AV9	0.5-1	DG-AV9-0.5-1	2/1/2019	**170**	**230**	**330**	**110**	**220**	**54**	**120**	**347**	**60**	**40**	**30**	**74**	**140**	**54**	**240**	**54**	**110**	**230**	**370**	**660**	**840**
DG-AV9	3.5-4	DG-AV9-3.5-4	2/1/2019	**27**	**34**	**62**	**24**	**40**	**14**	**25**	**60**	**22**	<11	**14**	**15**	**29**	**14**	**62**	<8.3	**57**	**60**	**54**	**76**	**170**
DG-AV9	8.5-9	DG-AV9-8.5-9	2/1/2019	**12**	**9.7**	**20**	**7.1**	**23**	<6.9	<8.2	**17**	**37**	**6.6**	**6.3**	**10**	<8.4	<6.9	**39**	**13**	**61**	**69**	**45**	**160**	**220**
DG-AW11	0.5-1	DG-AW11-0.5-1	1/23/2019	**27**	**39**	**47**	**15**	**41**	<7.9	**29**	**53**	<7.9	<7.9	<7.9	<7.9	**38**	<7.9	**61**	<7.9	<7.9	**36**	**66**	**110**	**180**
DG-AW11	3.5-4	DG-AW11-3.5-4	1/23/2019	<39	<39	**40**	<39	<39	<39	<39	**47**	<39	<39	<39	<39	<39	<39	**45**	<39	<39	<39	**44**	**47**	**84**
DG-AW11	7.5-8	DG-AW11-7.5-8	1/23/2019	<39	<39	<39	<39	**300**	<39	<39	**45**	<39	<39	<39	<39	<39	<39	<39	<39	<39	<39	**150**	**1600**	**1700**
DG-AW3	0.5-1	DG-AW3-0.5-1	1/31/2019	**180**	**340**	**440**	**180**	**220**	**76**	**200**	**500**	**65**	<27	**55**	**76**	**230**	**76**	**230**	<22	**75**	**110**	**260**	**42**	**52**
DG-AW3	3.5-4	DG-AW3-3.5-4	1/31/2019	**140**	**290**	**380**	**130**	**200**	**44**	**150**	**403**	**45**	<14	**69**	**43**	**200**	**44**	**250**	<11	**72**	**90**	**380**	**54**	**80**
DG-AX5	0.5-1	DG-AX5-0.5-1	12/20/2018	**2300**	**4400**	**5200**	**1800**	**2500**	**350**	**2100**	**5731**	<49	**160**	**410**	**450**	**2300**	**350**	**6300**	**120**	**130**	**2700**	**8900**	**47**	**130**
DG-AX5	3.5-4	DG-AX5-3.5-4	12/20/2018	**150**	**230**	**260**	**79**	**190**	**33**	**190**	**324**	**5.7**	**14**	**29**	**50**	**250**	**33**	**440**	**25**	**11**	**350**	**570**	**5.2**	<10
DG-AX9	0.5-1	DG-AX9-0.5-1	1/23/2019	**120**	**200**	**220**	**63**	**150**	**19**	**130**	**267**	**32**	**17**	**30**	**30**	**160**	**19**	**290**	**26**	**22**	**180**	**360**	**34**	**66**
DG-AX9	3.5-4	DG-AX9-3.5-4	1/23/2019	**500**	**830**	**790**	**290**	**690**	**73**	**720**	**1108**	**45**	**150**	**130**	**150**	**810**	**73**	**1500**	**82**	**96**	**1000**	**1800**	**590**	**930**
DG-AX9	9.5-10	DG-AX9-9.5-10	1/23/2019	**5.9**	**8.7**	**12**	<3.9	**11**	<3.9	**9.6**	**13**	<3.9	<3.9	<3.9	<3.9	**10**	<3.9	**19**	<3.9	**5.7**	**12**	**21**	**5.7**	**6.7**
DG-AY3	0.5-1	DG-AY3-0.5-1	1/31/2019	**3.8**	**11**	**15**	**6.9**	**6**	<6.8	**10**	**17**	<9.8	<5.5	**7.8**	**12**	**14**	<6.8	**8**	<4.3	<6.8	**4.4**	**9.6**	**17**	**14**
DG-AY3	3.5-4	DG-AY3-3.5-4	1/31/2019	<150	**440**	**470**	**280**	**170**	<350	<420	**693**	<500	<280	**240**	<200	**560**	<350	**270**	<220	<350	**250**	**420**	**130**	**170**
DG-N1	0.5-1	DG-N1-0.5-1	12/18/2018	**50**	**70**	**130**	**47**	**81**	**19**	**44**	**112**	**31**	<11	**23**	**58**	**50**	**19**	**91**	<8.7	**33**	**53**	**100**	**82**	**210**
DG-N1	3.5-4	DG-N1-3.5-4	12/18/2018	**2.7**	**4.2**	**9.2**	**2.9**	**7**	<3.5	<4.2	**7**	<4.9	<2.8	<2.4	<2.0	**5.6**	<3.5	**3.6**	<2.2	**3.6**	**11**	**5.8**	**3.2**	<10
DG-N13	0.5-1	DG-N13-0.5-1	1/10/2019	**62**	**140**	**180**	**61**	**87**	**11**	**64**	**182**	**10**	<5.5	**22**	**49**	**83**	**11**	**170**	<4.3	**22**	**59**	**230**	**59**	**170**
DG-N13 (D)	0.5-1	DG-N13 (D)-0.5-1	1/10/2019	**37**	**80**	**100**	**35**	**63**	**9.5**	**50**	**109**	**23**	<5.5	**18**	**48**	**72**	**9.5**	**100**	<4.3	**27**	**50**	**120**	**57**	**160**
DG-N13	3.5-4	DG-N13-3.5-4	1/10/2019	**8.7**	**8.1**	**14**	**2.1**	**30**	**3.6**	<4.2	**14**	**190**	**8.7**	**2.9**	**12**	**8.5**	**3.6**	**15**	**54**	**79**	**160**	**27**	**13**	**15**
DG-N13	7.5-8	DG-N13-7.5-8	1/10/2019	<1.5	<1.9	<2.1	<2.1	<1.4	<3.4	<4.1	**3**	<4.9	<2.7	<2.4	<2.0	<4.2	<3.4	<1.4	<2.2	<3.4	<1.8	<1.7	**1.3**	<9.8
DG-N4	4.5-5	DG-N4-4.5-5	12/19/2018	**10**	**7.4**	**57**	**5.7**	**55**	**6.2**	**7.5**	**21**	**740**	**250**	**73**	**200**	**10**	**6.2**	**44**	**330**	**280**	**720**	**69**	**2800**	<200
DG-N4	8.5-9	DG-N4-8.5-9	12/19/2018	**2.8**	**4.3**	**18**	**3.1**	**11**	<3.5	<4.2	**8**	<5.0	<2.8	<2.4	**3.4**	**4.8**	<3.5	**9.1**	**3.6**	**4.3**	**15**	**11**	**29**	**40**
DG-N5	0.5-1	DG-N5-0.5-1	1/8/2019	**88**	**100**	**170**	**67**	**120**	**14**	**48**	**145**	**27**	<5.4	**24**	**48**	**58**	**14**	**130**	<4.3	**23**	**60**	**140**	**68**	**190**
DG-N5 (D)	0.5-1	DG-N5 (D)-0.5-1	1/8/2019	**40**	**72**	**87**	**27**	**68**	**8.1**	**47**	**98**	**12**	**3.3**	**28**	**36**	**68**	**8.1**	**160**	**4.2**	**16**	**140**	**230**	**35**	**86**
DG-N5 (D)	0.5-1	DG-N5 (D)-0.5-1	1/24/2019	**71**	**43**	**59**	<39	**48**	<39	<39	**78**	<39	**200**	<39	**75**	<39	<39	**400**	**47**	<39	**280**	**220**	**100**	**110**
DG-N5	3.5-4	DG-N5-3.5-4	1/8/2019	**5.6**	**4.4**	**9.7**	**3**	**13**	<3.4	**4.8**	**8**	<4.9	<2.7	<2.3	**2.1**	**7.5**	<3.4	**11**	<2.1	**5**	**13**	**12**	**38**	**74**
DG-N9	0.5-1	DG-N9-0.5-1	1/10/2019	**2800**	**5400**	**6200**	**2400**	**4500**	**490**	**1800**	**6999**	**330**	**97**	**2100**	**710**	**2200**	**490**	**5700**	**310**	**1100**	**6000**	**11000**	**380**	**960**

Table 3: Polynuclear Aromatic Hydrocarbons and Total Petroleum Hydrocarbons as Diesel and Motor Oil Concentrations in Soil
UPC OU-2
Brisbane, California

Sample Location	Depth Range (ft bgs)	Sample Name	Collection Date	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Chrysene	Dibenzo(a,h)anthracene	Indeno(1,2,3-cd)pyrene	Benzo(a)pyrene Equivalent Total PAHs [4]	2-Methylnaphthalene	Acenaphthene	Acenaphthylene	Anthracene	Benzo(g,h,i)perylene	Dibenzo(a,h)anthracene	Fluoranthene	Fluorene	Naphthalene	Phenanthrene	Pyrene	TPH-Diesel (C10-C28)	TPH-Motor Oil (C24-C36)
Direct Exposure Human Health Risk Level Residential Soil Exposure ESL [1]				1.1E+03	1.1E+02	1.1E+03	1.1E+04	1.1E+05	1.1E+02	1.1E+03	--	2.4E+05	3.6E+06	--	1.8E+07	--	1.1E+02	2.4E+06	2.4E+06	3.8E+03	--	1.8E+06	2.6E+02	1.2E+04
Leaching to Groundwater Levels Non-drinking Water ESL [2]				1.0E+04	5.7E+03	7.5E+04	3.9E+04	1.0E+04	3.9E+05	3.2E+04	--	8.8E+02	1.2E+04	6.4E+03	1.9E+03	2.7E+04	3.9E+05	8.6E+04	6.0E+03	1.2E+03	1.1E+04	4.5E+04	7.3E+03	--
Regional Background [3]				--	--	--	--	--	--	--	4.0E+02	--	--	--	--	--	--	--	--	--	--	--	--	--
Units				µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	mg/kg	mg/kg
DG-N9	3.5-4	DG-N9-3.5-4	1/10/2019	**36**	**63**	**94**	**26**	**65**	**11**	**36**	**91**	**16**	<2.8	**32**	**10**	**47**	**11**	**72**	**4.4**	**36**	**86**	**110**	**15**	**37**
DG-O11	0.5-1	DG-O11-0.5-1	1/10/2019	**40**	**39**	**85**	**26**	**77**	**7**	**18**	**61**	**5.1**	<2.8	**7.1**	**7.2**	**22**	**7**	**37**	<2.2	**31**	**58**	**57**	**31**	**88**
DG-O11	3.5-4	DG-O11-3.5-4	1/10/2019	**150**	**140**	**230**	**88**	**230**	**18**	**53**	**202**	**66**	<14	**34**	**38**	**69**	**18**	**180**	<11	**78**	**100**	**320**	**99**	**330**
DG-O15	0.5-1	DG-O15-0.5-1	1/10/2019	**7.4**	**9.9**	**16**	**5.6**	**15**	<3.4	**7.1**	**15**	**9.3**	**2.8**	**5**	**3.1**	**9**	<3.4	**16**	**3**	**11**	**21**	**22**	**65**	**120**
DG-O15	3.5-4	DG-O15-3.5-4	1/10/2019	**3**	**5.1**	**8.3**	**3.1**	**5.5**	<3.4	<4.1	**8**	**9.1**	<2.7	<2.3	<1.9	<4.2	<3.4	**6.8**	<2.1	**6**	**6.4**	**7.9**	**8.3**	**30**
DG-O15 (D)	3.5-4	DG-O15 (D)-3.5-4	1/10/2019	**2.3**	**3.9**	**6.6**	**2.3**	**4.5**	<3.4	<4.1	**7**	**7.8**	<2.8	<2.4	<2.0	<4.2	<3.4	**5.4**	<2.2	**4.5**	**5.7**	**6.1**	**7.3**	**30**
DG-O15	7.5-8	DG-O15-7.5-8	1/10/2019	<1.5	<1.9	<2.1	<2.1	<1.4	<3.5	<4.1	**3**	<4.9	<2.8	<2.4	<2.0	<4.2	<3.5	<1.4	<2.2	<3.5	<1.8	<1.7	**1.2**	<9.9
DG-O3	0.5-1	DG-O3-0.5-1	12/18/2018	**4.3**	**5.2**	**7.2**	**3.4**	**3.3**	<3.5	<4.2	**8**	<5.0	<2.8	<2.4	<2.0	**5.8**	<3.5	**5.4**	<2.2	<3.5	**3.1**	**6.2**	**4.2**	**13**
DG-O3	3.5-4	DG-O3-3.5-4	12/18/2018	**3.3**	**5.1**	**8.1**	**3.3**	**4.5**	<3.5	<4.2	**8**	**6.8**	<2.8	<2.4	<2.0	**5.6**	<3.5	**8.2**	<2.2	**4.7**	**10**	**8.9**	**1.8**	<10
DG-O4	4.5-5	DG-O4-4.5-5	12/19/2018	**8.8**	**14**	**19**	**10**	**13**	<17	<21	**26**	**130**	**220**	**52**	**110**	<21	<17	**31**	**250**	**97**	**210**	**63**	**2000**	<99
DG-O4	9.5-10	DG-O4-9.5-10	12/19/2018	**2.8**	**5.1**	**21**	**2.8**	**9.1**	<3.5	<4.2	**9**	**7.7**	**14**	**3.8**	**8.1**	**5.6**	<3.5	**7.9**	**16**	**11**	**21**	**12**	**130**	**21**
DG-O7	0.5-1	DG-O7-0.5-1	1/8/2019	<7.4	**49**	<10	<10	**24**	<17	<21	**59**	<25	<14	<12	<9.8	**62**	<17	<6.9	<11	<17	**22**	**38**	**170**	**550**
DG-O7	3.5-4	DG-O7-3.5-4	1/8/2019	**4**	**4.4**	**6.5**	**2.4**	**6.4**	<3.4	<4.1	**7**	<4.8	<2.7	<2.3	<1.9	**5.9**	<3.4	**7**	<2.1	<3.4	**5.6**	**11**	**63**	**170**
DG-P1	0.5-1	DG-P1-0.5-1	11/21/2018	**120**	**180**	**170**	**64**	**130**	**34**	**86**	**252**	**16**	**15**	**43**	**45**	**110**	**34**	**180**	**16**	**25**	**120**	**220**	**15**	**43**
DG-P1	3.5-4	DG-P1-3.5-4	11/21/2018	**6.9**	**12**	**14**	**5.3**	**12**	**4**	**9**	**19**	**7.3**	**5.4**	**3.8**	**4**	**13**	**4**	**15**	**4**	**9.6**	**22**	**18**	**3.5**	**10**
DG-P1 (D)	3.5-4	DG-P1 (D)-3.5-4	11/21/2018	**18**	**20**	**21**	**9.1**	**22**	**4.5**	**11**	**30**	**6**	**3.7**	**5.4**	**14**	**15**	**4.5**	**39**	**6.8**	**7.7**	**53**	**44**	**4.7**	**16**
DG-P13	0.5-1	DG-P13-0.5-1	1/10/2019	<1.5	**2.3**	**4**	<2.1	**2.7**	<3.5	<4.2	**5**	<4.9	<2.8	<2.4	<2.0	<4.3	<3.5	**4**	<2.2	<3.5	**3.9**	**3.9**	**25**	**89**
DG-P13	3.5-4	DG-P13-3.5-4	1/10/2019	**5.8**	**11**	**36**	**6**	**29**	<3.4	**6.1**	**18**	**7.8**	<2.7	**4**	**2.7**	**9.4**	<3.4	**18**	<2.1	**45**	**50**	**21**	**90**	**330**
DG-P13 (D)	3.5-4	DG-P13 (D)-3.5-4	1/10/2019	**5.3**	**11**	**36**	**6.8**	**26**	<3.4	**5.8**	**18**	**6.2**	<2.7	**3.8**	**2.6**	**8.3**	<3.4	**18**	<2.2	**37**	**42**	**21**	**22**	**70**
DG-P4	4.5-5	DG-P4-4.5-5	12/19/2018	**27**	**36**	**80**	**25**	**72**	<35	<42	**67**	**730**	**240**	**110**	**230**	<43	<35	**84**	**360**	**520**	**270**	**140**	**3600**	<200
DG-P4	7.5-8	DG-P4-7.5-8	12/19/2018	**2.5**	**4.3**	**31**	**3.2**	**36**	**4.7**	<4.2	**13**	**11**	**5**	**2.8**	**6**	**6.1**	**4.7**	**12**	**6.7**	**23**	**83**	**12**	**54**	**15**
DG-P5	0.5-1	DG-P5-0.5-1	1/8/2019	**31**	**46**	**80**	**25**	**54**	**6.7**	**22**	**66**	**34**	**3.3**	**14**	**27**	**25**	**6.7**	**58**	**2.4**	**38**	**47**	**72**	**35**	**110**
DG-P5	3.5-4	DG-P5-3.5-4	1/8/2019	**29**	**34**	**62**	**23**	**41**	<17	<20	**53**	<24	<13	<11	**9.9**	**27**	<17	**37**	<10	**25**	**30**	**54**	**100**	**940**
DG-P9	0.5-1	DG-P9-0.5-1	11/21/2018	**8.7**	**16**	**18**	<4.2	**10**	<6.9	**16**	**24**	**10**	<5.6	**24**	**13**	**50**	<6.9	**9.8**	<4.4	**10**	**17**	**17**	**96**	**380**
DG-P9	3.5-4	DG-P9-3.5-4	11/21/2018	**11**	**17**	**67**	**10**	**67**	**11**	**14**	**37**	<4.7	<2.6	**3.5**	**3.7**	**16**	**11**	**54**	<2.1	<3.3	**240**	**42**	**14**	**45**
DG-Q11	0.5-1	DG-Q11-0.5-1	1/10/2019	**150**	**150**	**220**	**75**	**280**	<69	<83	**227**	**220**	<55	<47	**74**	**120**	<69	**170**	<43	**150**	**380**	**300**	**950**	**2800**
DG-Q11 (D)	0.5-1	DG-Q11 (D)-0.5-1	1/10/2019	**58**	**91**	**150**	<80	**170**	<130	<160	**185**	<190	<110	<91	<76	<160	<130	**110**	<84	**130**	**230**	**180**	**920**	**2600**
DG-Q11	3.5-4	DG-Q11-3.5-4	1/10/2019	<140	<180	<200	<200	<130	<340	<400	**298**	**520**	<270	<230	<190	<410	<340	<130	<210	<340	**260**	<160	**2300**	**5700**
DG-Q15	0.5-1	DG-Q15-0.5-1	1/11/2019	**230**	**180**	**360**	**42**	**480**	**83**	**96**	**333**	**1500**	<55	<47	**44**	**180**	**83**	**83**	**55**	**590**	**620**	**160**	**460**	**1100**
DG-Q15 (D)	0.5-1	DG-Q15 (D)-0.5-1	1/11/2019	**180**	**260**	**390**	<100	**530**	<170	<210	**414**	**1600**	<140	<120	<99	**220**	<170	**100**	<110	**580**	**690**	**280**	**1200**	**2900**
DG-Q15	3.5-4	DG-Q15-3.5-4	1/11/2019	**24**	**33**	**46**	**17**	**40**	**5.2**	**24**	**48**	**89**	**2.8**	**12**	**8.8**	**35**	**5.2**	**56**	**2.8**	**74**	**44**	**68**	**32**	**150**
DG-Q15	7.5-8	DG-Q15-7.5-8	1/11/2019	<1.5	<1.9	<2.0	<2.0	**1.4**	<3.4	<4.1	**3**	<4.9	<2.7	<2.3	<1.9	<4.2	<3.4	**2.3**	<2.1	<3.4	<1.8	<1.7	**2.8**	**20**
DG-Q3	0.5-1	DG-Q3-0.5-1	12/18/2018	**6**	**8.7**	**11**	**4.9**	**6.9**	<3.5	**5.9**	**13**	**5.2**	<2.8	**2.5**	**3**	**8.6**	<3.5	**12**	<2.2	<3.5	**7.5**	**15**	**11**	**31**
DG-Q3	3.5-4	DG-Q3-3.5-4	12/18/2018	<1.5	**2.5**	**3.3**	<2.1	<1.4	<3.5	<4.2	**5**	<5.0	<2.8	<2.4	<2.0	<4.3	<3.5	**1.6**	<2.2	<3.5	<1.8	<1.7	**2.5**	<10
DG-Q7	0.5-1	DG-Q7-0.5-1	1/8/2019	**85**	**120**	**200**	**66**	**160**	**26**	**93**	**185**	**68**	<13	**64**	**180**	**170**	**26**	**190**	**12**	**49**	**180**	**230**	**270**	**530**
DG-Q7	3.5-4	DG-Q7-3.5-4	1/8/2019	**11**	**11**	**32**	**9.4**	**27**	**4.4**	**10**	**21**	**27**	<2.8	**7.5**	**20**	**13**	**4.4**	**28**	<2.2	**40**	**44**	**27**	**61**	**150**
DG-Q7 (D)	3.5-4	DG-Q7 (D)-3.5-4	1/8/2019	**67**	**89**	**160**	**52**	**120**	<17	**57**	**127**	**57**	<13	**45**	**140**	**80**	<17	**120**	<11	**40**	**90**	**150**	**280**	**520**
DG-R1	0.5-1	DG-R1-0.5-1	12/17/2018	**190**	**310**	**470**	**130**	**390**	**68**	**170**	**463**	**120**	<14	**130**	**180**	**240**	**68**	**300**	**12**	**110**	**200**	**620**	**190**	**440**
DG-R1	3.5-4	DG-R1-3.5-4	12/17/2018	**5**	**4.3**	**26**	**3.3**	**22**	**4**	**4.6**	**12**	**72**	**4**	**2.6**	**120**	**6.9**	**4**	**11**	**13**	**21**	**52**	**12**	**92**	**61**
DG-R13	0.5-1	DG-R13-0.5-1	1/28/2019	**300**	**200**	**470**	**110**	**620**	**140**	**120**	**431**	**3300**	<55	**49**	**150**	**160**	**140**	**240**	**130**	**1500**	**1400**	**330**	**350**	**870**
DG-R13	3.5-4	DG-R13-3.5-4	1/28/2019	**6.8**	**7.9**	**16**	**4.2**	**13**	**4**	<4.1	**14**	**72**	<2.7	<2.3	**3.3**	**4.8**	**4**	**7.1**	**3.1**	**32**	**32**	**9.5**	**24**	**59**
DG-R15	3.5-4	DG-R15-3.5-4	12/21/2018	**320**	**480**	**700**	<210	**1100**	<340	<410	**775**	<490	<280	<240	**710**	<420	<340	**190**	<220	**1000**	**1000**	**940**	**10000**	**29000**
DG-R5	0.5-1	DG-R5-0.5-1	1/29/2019	**230**	**280**	**440**	**140**	**240**	**46**	**120**	**407**	**73**	<14	**32**	**48**	**130**	**46**	**330**	<11	**70**	**140**	**300**	**62**	**150**
DG-R5	3.5-4	DG-R5-3.5-4	1/29/2019	**82**	**110**	**140**	**33**	**110**	**18**	**49**	**156**	**10**	<5.5	**19**	**12**	**56**	**18**	**110**	<4.3	**12**	**45**	**140**	**11**	**32**
DG-R5 (D)	3.5-4	DG-R5 (D)-3.5-4	1/29/2019	**73**	**97**	**150**	**47**	**100**	**16**	**40**	**140**	**14**	<5.5	**21**	**21**	**48**	**16**	**110**	<4.3	**14**	**53**	**130**	**10**	**35**

Table 3: Polynuclear Aromatic Hydrocarbons and Total Petroleum Hydrocarbons as Diesel and Motor Oil Concentrations in Soil
UPC OU-2
Brisbane, California

Sample Location	Depth Range (ft bgs)	Sample Name	Collection Date	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Chrysene	Dibenzo(a,h)anthracene	Indeno(1,2,3-cd)pyrene	Benzo(a)pyrene Equivalent Total PAHs [4]	2-Methylnaphthalene	Acenaphthene	Acenaphthylene	Anthracene	Benzo(g,h,i)perylene	Dibenzo(a,h)anthracene	Fluoranthene	Fluorene	Naphthalene	Phenanthrene	Pyrene	TPH-Diesel (C10-C28)	TPH-Motor Oil (C24-C36)
Direct Exposure Human Health Risk Level Residential Soil Exposure ESL [1]				1.1E+03	1.1E+02	1.1E+03	1.1E+04	1.1E+05	1.1E+02	1.1E+03	--	2.4E+05	3.6E+06	--	1.8E+07	--	1.1E+02	2.4E+06	2.4E+06	3.8E+03	--	1.8E+06	2.6E+02	1.2E+04
Leaching to Groundwater Levels Non-drinking Water ESL [2]				1.0E+04	5.7E+03	7.5E+04	3.9E+04	1.0E+04	3.9E+05	3.2E+04	--	8.8E+02	1.2E+04	6.4E+03	1.9E+03	2.7E+04	3.9E+05	8.6E+04	6.0E+03	1.2E+03	1.1E+04	4.5E+04	7.3E+03	--
Regional Background [3]				--	--	--	--	--	--	--	4.0E+02	--	--	--	--	--	--	--	--	--	--	--	--	--
Units				µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	mg/kg	mg/kg
DG-R9	0.5-1	DG-R9-0.5-1	1/22/2019	**98**	**220**	**300**	**110**	**100**	<86	**120**	**316**	<120	<69	**120**	**190**	**140**	<86	**220**	<54	**130**	**140**	**260**	**320**	**390**
DG-R9	3.5-4	DG-R9-3.5-4	1/22/2019	**11**	**15**	**28**	**7.3**	**16**	**4.5**	**8.6**	**24**	<4.7	<2.7	**4.7**	**4.9**	**10**	**4.5**	**14**	<2.1	**5.1**	**19**	**20**	**39**	**44**
DG-S11	0.5-1	DG-S11-0.5-1	1/10/2019	<74	<94	<100	<100	<69	<170	<210	**152**	<250	<140	<120	<99	<210	<170	<69	<110	<170	<89	<84	**680**	**1900**
DG-S11	3.5-4	DG-S11-3.5-4	1/10/2019	**97**	**97**	**240**	<83	**230**	<140	<170	**210**	**240**	<110	<95	<79	<170	<140	**290**	<87	<140	**460**	**320**	**1200**	**2700**
DG-S15	0.5-1	DG-S15-0.5-1	1/11/2019	<30	**42**	**58**	<41	<28	<69	<83	**88**	<98	<55	<47	<39	<85	<69	**30**	<43	<69	**41**	**71**	**940**	**2400**
DG-S15	3.5-4	DG-S15-3.5-4	1/11/2019	**7.8**	**6.3**	**57**	**6.7**	**74**	**4.5**	**7**	**18**	**42**	<2.7	**3**	**5**	**9.7**	**4.5**	**41**	**11**	**100**	**280**	**28**	**13**	**33**
DG-S15 (D)	3.5-4	DG-S15 (D)-3.5-4	1/11/2019	**10**	**8.4**	**36**	**3.7**	**37**	**3.5**	**5.1**	**17**	**140**	**3.8**	**2.4**	**6.3**	**9.7**	**3.5**	**24**	**37**	**89**	**140**	**27**	**16**	**41**
DG-S15	6-6.5	DG-S15-6-6.5	1/11/2019	<30	<38	<42	<42	**67**	<69	<83	**62**	<99	<55	<47	<40	<85	<69	<28	<44	<69	**240**	**120**	**1500**	**1400**
DG-S3	0.5-1	DG-S3-0.5-1	12/18/2018	**21**	**28**	**42**	**13**	**30**	**5.1**	**15**	**41**	**22**	<2.8	**8.9**	**12**	**18**	**5.1**	**42**	<2.2	**17**	**31**	**57**	**90**	**230**
DG-S3	3.5-4	DG-S3-3.5-4	12/18/2018	**31**	**84**	**130**	**43**	**70**	<70	<84	**140**	<99	<56	<48	<40	<86	<70	**75**	<44	<70	**97**	**81**	**740**	**4700**
DG-S7	0.5-1	DG-S7-0.5-1	1/8/2019	**85**	**120**	**180**	**67**	**140**	**19**	**61**	**172**	**33**	<14	**49**	**89**	**90**	**19**	**160**	<11	**32**	**100**	**200**	**260**	**710**
DG-S7	3.5-4	DG-S7-3.5-4	1/8/2019	**18**	**13**	**26**	**8.2**	**33**	<3.4	**8.6**	**20**	**15**	<2.7	**6.6**	**12**	**11**	<3.4	**52**	**3.8**	**34**	**53**	**55**	**97**	**140**
DG-S9	4.5-5	DG-S9-4.5-5	12/20/2018	**98**	**220**	**420**	<42	**330**	<70	**100**	**317**	**110**	<56	**58**	**210**	**140**	<70	**310**	<44	**120**	**140**	**700**	**3000**	**7300**
DG-S9	7.5-8	DG-S9-7.5-8	12/20/2018	**20**	**21**	**55**	<10	**45**	<17	<21	**38**	<25	**35**	<12	**99**	<21	<17	**50**	**17**	**24**	**120**	**92**	**1900**	**2700**
DG-T1	0.5-1	DG-T1-0.5-1	12/17/2018	**140**	**250**	**360**	**100**	**240**	**50**	**130**	**364**	**83**	<14	**100**	**110**	**170**	**50**	**200**	**12**	**78**	**130**	**400**	**180**	**540**
DG-T1	3.5-4	DG-T1-3.5-4	12/17/2018	**3.7**	**5.9**	**14**	**3.6**	**12**	<3.5	<4.2	**10**	<5.0	<2.8	<2.4	**2**	**6.3**	<3.5	**6.5**	<2.2	**6.4**	**25**	**10**	**1.6**	<10
DG-T1 (D)	3.5-4	DG-T1 (D)-3.5-4	12/17/2018	**2.8**	**4.7**	**9.5**	**2.7**	**5.8**	<3.5	<4.2	**8**	<5.0	<2.8	<2.4	**2.2**	**4.6**	<3.5	**3.8**	<2.2	<3.5	**12**	**7**	**5.8**	**19**
DG-T13	0.5-1	DG-T13-0.5-1	1/10/2019	**8.5**	**14**	**29**	<10	**26**	<17	<21	**27**	**78**	<14	<12	**10**	<21	<17	**20**	<11	**56**	**43**	**27**	**280**	**730**
DG-T13 (D)	0.5-1	DG-T13 (D)-0.5-1	1/10/2019	**21**	**34**	**56**	<21	**57**	<35	<42	**61**	**220**	<28	**25**	**21**	**74**	<35	**38**	<22	**120**	**94**	**55**	**530**	**1500**
DG-T13	3.5-4	DG-T13-3.5-4	1/10/2019	**10**	**11**	**15**	**5.3**	**14**	<3.5	**8.5**	**16**	**5.4**	<2.8	<2.4	**3.2**	**13**	<3.5	**27**	<2.2	**5.2**	**25**	**23**	**11**	**27**
DG-T17	0.5-1	DG-T17-0.5-1	1/28/2019	**350**	**210**	**410**	**170**	**340**	<170	<210	**384**	**2100**	<140	**140**	**330**	<210	<170	**740**	<110	**1300**	**740**	**630**	**1200**	**3400**
DG-T17	3.5-4	DG-T17-3.5-4	1/28/2019	**18**	**41**	**78**	**36**	**28**	<34	<41	**70**	<49	<27	<23	**34**	<42	<34	**46**	<21	<34	**24**	**54**	**59**	**200**
DG-T17	7-7.5	DG-T17-7-7.5	1/28/2019	**140**	**230**	**400**	**98**	**170**	**69**	**100**	**364**	**200**	<27	<23	**87**	**130**	**69**	**270**	**61**	**480**	**260**	**240**	**940**	**900**
DG-T17 (D)	7-7.5	DG-T17 (D)-7-7.5	1/28/2019	**220**	**180**	**480**	**120**	**290**	**53**	**110**	**315**	**260**	<28	<24	**85**	**110**	**53**	**350**	**68**	**470**	**320**	**370**	**420**	**450**
DG-T5	0.5-1	DG-T5-0.5-1	1/8/2019	**33**	**55**	**54**	**19**	**47**	**9.3**	**29**	**76**	**17**	**3.1**	**4.9**	**10**	**42**	**9.3**	**51**	<2.2	**25**	**33**	**67**	**22**	**47**
DG-T5	3.5-4	DG-T5-3.5-4	1/8/2019	<1.5	**2.6**	**4.3**	<2.1	**2.3**	<3.5	<4.1	**5**	<4.9	<2.8	<2.4	<2.0	<4.2	<3.5	**2**	<2.2	<3.5	<1.8	**2.3**	**3.4**	<9.9
DG-T9	0.5-1	DG-T9-0.5-1	1/10/2019	**7.5**	**8.5**	**15**	**4.8**	**12**	<3.4	**4.3**	**13**	**7.5**	<2.7	**3**	**7.1**	**6.6**	<3.4	**15**	<2.1	**6.8**	**12**	**16**	**46**	**86**
DG-T9	3.5-4	DG-T9-3.5-4	1/10/2019	<1.5	<1.9	<2.1	<2.1	<1.4	<3.4	<4.1	**3**	<4.9	<2.7	<2.3	<2.0	<4.2	<3.4	<1.4	<2.1	<3.4	<1.8	<1.7	**1.9**	<9.9
DG-U11	0.5-1	DG-U11-0.5-1	1/10/2019	**92**	**140**	**190**	<83	**300**	<140	<170	**247**	**1000**	**130**	<94	**170**	<170	<140	**230**	**150**	**380**	**650**	**660**	**3600**	**4900**
DG-U11	3.5-4	DG-U11-3.5-4	1/10/2019	**12**	**17**	**34**	**8.7**	**30**	<3.5	**6.3**	**24**	**46**	**8**	**7.8**	**28**	**8.4**	<3.5	**32**	**9**	**40**	**76**	**51**	**270**	**450**
DG-U13	7.5-8	DG-U13-7.5-8	12/21/2018	**45**	**86**	**92**	<41	**200**	<69	<83	**139**	<98	<55	<47	**44**	<84	<69	**29**	<43	<69	**37**	**280**	**1100**	**2700**
DG-U15	3.5-4	DG-U15-3.5-4	1/28/2019	<2.9	**8**	**9.9**	**5.2**	**3.9**	<6.7	<8.0	**13**	**12**	<5.4	<4.6	**4.6**	**8.6**	<6.7	**6.5**	<4.2	**9**	**5.6**	**9**	**20**	**66**
DG-U15	8.5-9	DG-U15-8.5-9	1/28/2019	<73	**150**	**180**	<100	<68	<170	<200	**267**	<240	<140	<120	**120**	<210	<170	<68	<110	<170	<87	**280**	**2400**	**3100**
DG-U17	0.5-1	DG-U17-0.5-1	1/28/2019	<29	**66**	**110**	**54**	**62**	<69	<82	**118**	**320**	<55	<47	**67**	**87**	<69	**100**	<43	**300**	**170**	**130**	**500**	**1800**
DG-U3	0.5-1	DG-U3-0.5-1	12/18/2018	**55**	**61**	**130**	**47**	**81**	**11**	**32**	**94**	**70**	<5.6	**26**	**65**	**32**	**11**	**130**	**5.2**	**72**	**110**	**130**	**98**	**220**
DG-U3	3.5-4	DG-U3-3.5-4	12/18/2018	**16**	**10**	**110**	**13**	**130**	**14**	**13**	**38**	**130**	**20**	**11**	**27**	**17**	**14**	**140**	**12**	**280**	**650**	**70**	**12**	**36**
DG-U3 (D)	3.5-4	DG-U3 (D)-3.5-4	12/18/2018	**79**	**140**	**210**	**75**	**120**	**70**	<84	**244**	<100	<56	<48	**110**	**110**	**70**	**140**	<44	**92**	**230**	**140**	**330**	**2200**
DG-U7	0.5-1	DG-U7-0.5-1	1/8/2019	**10**	**20**	**30**	**13**	**25**	**6.4**	**22**	**33**	**5.8**	<2.6	**5.8**	**11**	**33**	**6.4**	**19**	<2.1	**5.8**	**11**	**23**	**15**	**52**
DG-U7	3.5-4	DG-U7-3.5-4	1/8/2019	**23**	**20**	**38**	**15**	**44**	**4.4**	**14**	**32**	**91**	<2.7	**11**	**11**	**20**	**4.4**	**40**	**6.5**	**79**	**59**	**51**	**28**	**62**
DG-V1	0.5-1	DG-V1-0.5-1	12/17/2018	**150**	**260**	**300**	**85**	**230**	**49**	**150**	**370**	**34**	<5.6	**83**	**45**	**200**	**49**	**190**	**11**	**48**	**96**	**440**	**41**	**76**
DG-V1	3.5-4	DG-V1-3.5-4	12/17/2018	**4.4**	**7.8**	**66**	**5.1**	**84**	**9.5**	**8.4**	**25**	**8.9**	<2.8	<2.4	**4.6**	**12**	**9.5**	**30**	**4.9**	**9.5**	**220**	**22**	**2.8**	<10
DG-V13	0.5-1	DG-V13-0.5-1	1/10/2019	<28	**63**	**100**	<40	**66**	<66	<79	**112**	<94	<53	<45	<38	<81	<66	**64**	<42	**70**	**78**	**83**	**710**	**2300**
DG-V13	3.5-4	DG-V13-3.5-4	1/10/2019	**170**	**170**	**220**	**83**	**200**	<68	<82	**248**	<98	<55	<47	<39	**100**	<68	**260**	<43	<68	**250**	**440**	**710**	**2300**
DG-V13	7.5-8	DG-V13-7.5-8	1/10/2019	**6.2**	**3**	**5.2**	**2.4**	**6.1**	<3.4	<4.0	**6**	<4.8	<2.7	<2.3	**3.5**	<4.1	<3.4	**13**	<2.1	<3.4	**13**	**8.8**	**5.7**	**22**
DG-V17	0.5-1	DG-V17-0.5-1	1/28/2019	**33**	**54**	**93**	**29**	**40**	**19**	**34**	**89**	<25	<14	<12	**14**	**41**	**19**	**41**	<11	<17	**25**	**69**	**70**	**210**

Table 3: Polynuclear Aromatic Hydrocarbons and Total Petroleum Hydrocarbons as Diesel and Motor Oil Concentrations in Soil
UPC OU-2
Brisbane, California

Sample Location	Depth Range (ft bgs)	Sample Name	Collection Date	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Chrysene	Dibenzo(a,h)anthracene	Indeno(1,2,3-cd)pyrene	Benzo(a)pyrene Equivalent Total PAHs [4]	2-Methylnaphthalene	Acenaphthene	Acenaphthylene	Anthracene	Benzo(g,h,i)perylene	Dibenzo(a,h)anthracene	Fluoranthene	Fluorene	Naphthalene	Phenanthrene	Pyrene	TPH-Diesel (C10-C28)	TPH-Motor Oil (C24-C36)
Direct Exposure Human Health Risk Level Residential Soil Exposure ESL [1]				1.1E+03	1.1E+02	1.1E+03	1.1E+04	1.1E+05	1.1E+02	1.1E+03	--	2.4E+05	3.6E+06	--	1.8E+07	--	1.1E+02	2.4E+06	2.4E+06	3.8E+03	--	1.8E+06	2.6E+02	1.2E+04
Leaching to Groundwater Levels Non-drinking Water ESL [2]				1.0E+04	5.7E+03	7.5E+04	3.9E+04	1.0E+04	3.9E+05	3.2E+04	--	8.8E+02	1.2E+04	6.4E+03	1.9E+03	2.7E+04	3.9E+05	8.6E+04	6.0E+03	1.2E+03	1.1E+04	4.5E+04	7.3E+03	--
Regional Background [3]				--	--	--	--	--	--	--	4.0E+02	--	--	--	--	--	--	--	--	--	--	--	--	--
Units				µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	mg/kg	mg/kg
DG-V17	3.5-4	DG-V17-3.5-4	1/28/2019	<1.5	**4.5**	**5.1**	**3.1**	**2.1**	<3.4	<4.1	**7**	<4.8	<2.7	<2.3	<1.9	**4.2**	<3.4	**4.1**	<2.1	<3.4	**1.9**	**5.1**	**3.1**	**16**
DG-V17 (D)	3.5-4	DG-V17 (D)-3.5-4	1/28/2019	**2.2**	**7.1**	**9.1**	**3.9**	**3.8**	<3.3	**5.7**	**10**	<4.7	<2.7	<2.3	<1.9	**6.3**	<3.3	**8.4**	<2.1	<3.3	**4.1**	**11**	**3.4**	**19**
DG-V17	9.5-10	DG-V17-9.5-10	1/28/2019	**180**	**240**	**290**	**81**	**190**	**26**	**90**	**323**	**340**	**65**	**34**	**130**	**140**	**26**	**540**	**68**	**290**	**380**	**770**	**170**	**210**
DG-V5	0.5-1	DG-V5-0.5-1	1/8/2019	**46**	**62**	**97**	**31**	**77**	**11**	**31**	**91**	**79**	**4.9**	**15**	**30**	**39**	**11**	**110**	**3.4**	**61**	**91**	**110**	**48**	**110**
DG-V5	3.5-4	DG-V5-3.5-4	1/8/2019	<1.5	**2**	**3.5**	<2.1	**1.8**	<3.5	<4.2	**4**	<4.9	<2.8	<2.4	<2.0	<4.2	<3.5	**2.6**	<2.2	<3.5	**2.2**	**3.1**	**1.7**	<9.9
DG-V5	7.5-8	DG-V5-7.5-8	1/8/2019	<1.5	<1.9	<2.1	<2.1	<1.4	<3.4	<4.1	**3**	<4.9	<2.8	<2.4	<2.0	<4.2	<3.4	<1.4	<2.2	<3.4	<1.8	<1.7	**0.98**	<9.9
DG-V9	0.5-1	DG-V9-0.5-1	1/10/2019	<1.5	<1.9	**2.2**	<2.1	**1.8**	<3.4	<4.1	**3**	<4.9	<2.7	<2.3	<2.0	<4.2	<3.4	**2.7**	<2.1	<3.4	**2.7**	**3.1**	**5**	**16**
DG-V9	3.5-4	DG-V9-3.5-4	1/10/2019	**2.1**	<1.8	**11**	**2.8**	**17**	<3.4	<4.0	**4**	**20**	<2.7	**4.5**	**2.4**	<4.1	<3.4	**29**	**3**	**130**	**59**	**16**	**15**	**27**
DG-V9	7.5-8	DG-V9-7.5-8	1/10/2019	<1.4	<1.8	<2.0	<2.0	<1.3	<3.4	<4.0	**3**	<4.8	<2.7	<2.3	<1.9	<4.1	<3.4	<1.3	<2.1	<3.4	<1.7	<1.6	**2.8**	**18**
DG-W11	0.5-1	DG-W11-0.5-1	1/29/2019	**250**	**460**	**550**	**210**	**290**	**89**	**230**	**654**	<98	<55	**140**	**120**	**290**	**89**	**380**	<43	**86**	**170**	**650**	**240**	**620**
DG-W11	3.5-4	DG-W11-3.5-4	1/29/2019	<1.5	**5.1**	**5.6**	**3.1**	**2.3**	<3.4	**4.1**	**8**	<4.9	<2.7	<2.4	**2.4**	**4.6**	<3.4	**4.3**	<2.2	<3.4	**3.2**	**7.2**	**1.4**	<9.5
DG-W11 (D)	3.5-4	DG-W11 (D)-3.5-4	1/29/2019	<1.5	**5.4**	**5.5**	**3.2**	**2**	<3.4	**4.3**	**8**	<4.9	<2.8	<2.4	**2.3**	**4.8**	<3.4	**4**	<2.2	<3.4	**3.3**	**6.5**	**3.4**	**13**
DG-W15	0.5-1	DG-W15-0.5-1	1/28/2019	<300	**540**	**610**	**480**	<280	<690	<830	**1007**	<990	<560	<480	<400	<850	<690	**350**	<440	<690	<360	**490**	**700**	**2900**
DG-W15 (D)	0.5-1	DG-W15 (D)-0.5-1	1/28/2019	<73	**130**	**140**	**120**	<68	<170	<200	**244**	<240	<140	<120	<98	<210	<170	<68	<110	<170	<88	**100**	**510**	**2600**
DG-W15	3.5-4	DG-W15-3.5-4	1/28/2019	<150	**260**	**260**	**210**	<140	<350	<410	**491**	<490	<280	<240	<200	<420	<350	<140	<220	<350	<180	**580**	**2200**	**4400**
DG-W3	0.5-1	DG-W3-0.5-1	12/18/2018	**27**	**36**	**45**	**21**	**25**	<17	<21	**53**	<25	<14	**15**	**32**	**25**	<17	**44**	<11	**17**	**26**	**55**	**62**	**160**
DG-W3	3.5-4	DG-W3-3.5-4	12/18/2018	**4.8**	**7**	**60**	**5.2**	**60**	**6.8**	**7**	**21**	<5.0	<2.8	<2.4	**2.6**	**9**	**6.8**	**27**	<2.2	**8.6**	**78**	**19**	**9.4**	**12**
DG-W7	0.5-1	DG-W7-0.5-1	1/29/2019	**39**	**57**	**100**	**33**	**36**	**21**	**48**	**97**	**42**	<14	**29**	**52**	**67**	**21**	**66**	<11	**42**	**50**	**63**	**32**	**74**
DG-W7	3.5-4	DG-W7-3.5-4	1/29/2019	**13**	**14**	**43**	**14**	**37**	**7**	**11**	**28**	**22**	<5.5	**7.4**	**7.2**	**12**	**7**	**59**	<4.3	**69**	**81**	**43**	**35**	**68**
DG-X1	0.5-1	DG-X1-0.5-1	12/17/2018	**810**	**1300**	**1600**	**530**	**1400**	**270**	**770**	**1895**	**190**	<14	**470**	**260**	**1100**	**270**	**1100**	**67**	**310**	**600**	**2600**	**95**	**130**
DG-X1 (D)	0.5-1	DG-X1 (D)-0.5-1	12/17/2018	**4400**	**5200**	**6800**	**2300**	**6100**	**1100**	**3100**	**7759**	**220**	<28	**1400**	**730**	**3900**	**1100**	**2600**	**160**	**350**	**1000**	**6600**	**69**	**120**
DG-X1	3.5-4	DG-X1-3.5-4	12/17/2018	**20**	**3.1**	**62**	<2.1	**30**	**3.9**	<4.2	**15**	<5.0	<2.8	<2.4	<2.0	<4.3	**3.9**	**11**	<2.2	**5.3**	**30**	**5.1**	**2.9**	<10
DG-X13	0.5-1	DG-X13-0.5-1	1/22/2019	**38**	**240**	**590**	**99**	**97**	<69	**92**	**348**	<98	<55	<93	**85**	**96**	<69	**68**	<85	<69	**57**	**210**	**490**	**1300**
DG-X13	3.5-4	DG-X13-3.5-4	1/22/2019	<15	**30**	**43**	**27**	<14	<34	<41	**54**	<49	<27	**32**	<20	<42	<34	**16**	<22	<34	<18	**28**	**180**	**280**
DG-X13 (D)	3.5-4	DG-X13 (D)-3.5-4	1/22/2019	<15	**52**	**100**	**38**	**26**	<34	**59**	**86**	<49	<27	**53**	**28**	**110**	<34	**31**	<21	<34	<17	**86**	**860**	**1300**
DG-X17	0.5-1	DG-X17-0.5-1	1/28/2019	<150	**230**	**250**	**210**	<140	<350	<420	**461**	<500	<280	<240	<200	<430	<350	<140	<220	<350	<180	**200**	**420**	**1600**
DG-X17	3.5-4	DG-X17-3.5-4	1/28/2019	<290	**550**	**550**	**450**	<270	<690	<820	**1010**	<980	<550	<470	<390	<840	<690	**270**	<430	<690	<350	**560**	**1500**	**4600**
DG-X5	0.5-1	DG-X5-0.5-1	1/8/2019	**46**	**61**	**94**	**34**	**73**	**11**	**37**	**90**	**71**	**3.7**	**27**	**70**	**68**	**11**	**94**	<2.2	**68**	**140**	**110**	**78**	**190**
DG-X5	3.5-4	DG-X5-3.5-4	1/8/2019	<1.5	<1.9	**2.6**	<2.1	<1.4	<3.4	<4.1	**3**	<4.9	<2.8	<2.4	<2.0	<4.2	<3.4	**1.6**	<2.2	<3.4	<1.8	**1.8**	**1.3**	<9.9
DG-X9	0.5-1	DG-X9-0.5-1	1/10/2019	**8.4**	**7.9**	**13**	**4.1**	**4.3**	**3.8**	**20**	**16**	**5.3**	<2.8	**22**	**47**	**65**	**3.8**	**6.9**	<2.2	**8.9**	**6.5**	**8**	**31**	**74**
DG-X9	3.5-4	DG-X9-3.5-4	1/10/2019	**18**	**10**	**27**	**7.7**	**44**	<3.4	**6.4**	**17**	**120**	<2.7	<2.4	**15**	**8.2**	<3.4	**69**	**7.8**	**390**	**160**	**52**	**68**	**90**
DG-Y11	0.5-1	DG-Y11-0.5-1	1/21/2019	**220**	**680**	**690**	**340**	**280**	**400**	**520**	**1227**	<480	<270	<230	**260**	**900**	**400**	**320**	<210	<340	**180**	**920**	**2200**	**6100**
DG-Y11	3.5-4	DG-Y11-3.5-4	1/21/2019	<2.8	**8.5**	**16**	**6**	**6.9**	**6.8**	**10**	**18**	<9.4	<5.3	**6.5**	**34**	**19**	**6.8**	**5.5**	<4.1	<6.6	**12**	**9.8**	**250**	**260**
DG-Y15	0.5-1	DG-Y15-0.5-1	1/31/2019	<59	**100**	**140**	<83	<55	<140	<170	**196**	<200	<110	<95	**85**	<170	<140	**87**	<87	<140	**77**	**110**	**620**	**860**
DG-Y15	3.5-4	DG-Y15-3.5-4	1/31/2019	<7.3	**16**	**20**	**14**	<6.8	<17	<21	**28**	<24	<14	<12	**13**	<21	<17	**12**	<11	<17	**13**	**18**	**180**	**270**
DG-Y15 (D)	3.5-4	DG-Y15 (D)-3.5-4	1/31/2019	<7.5	**20**	**29**	**16**	**9.3**	<17	<21	**33**	<25	<14	<12	**13**	<21	<17	**18**	<11	<17	**16**	**26**	**120**	**170**
DG-Y15	7.5-8	DG-Y15-7.5-8	1/31/2019	<59	**170**	**250**	<83	**280**	<140	<170	**277**	**2600**	**1000**	**400**	**260**	<170	<140	**290**	**820**	**1300**	**990**	**830**	**3600**	**1600**
DG-Y19	0.5-1	DG-Y19-0.5-1	1/28/2019	<150	**240**	**250**	<210	<140	<350	<420	**470**	<500	<280	<240	<200	<430	<350	<140	<220	<350	<180	**170**	**1000**	**6400**
DG-Y19	3.5-4	DG-Y19-3.5-4	1/28/2019	**50**	**69**	**140**	**52**	**56**	<33	**49**	**110**	**53**	<27	**25**	**42**	**51**	<33	**74**	<21	**36**	**68**	**97**	**82**	**320**
DG-Y19	7.5-8	DG-Y19-7.5-8	1/28/2019	<1.4	**3.4**	**3.6**	**2.4**	<1.3	<3.4	<4.0	**6**	<4.8	<2.7	<2.3	<1.9	<4.1	<3.4	**2**	<2.1	<3.4	<1.7	**5**	**5.5**	<9.8
DG-Y3	0.5-1	DG-Y3-0.5-1	12/18/2018	**210**	**300**	**470**	**200**	**200**	<170	<210	**466**	<250	<140	<120	**140**	**230**	<170	**410**	<110	<170	**210**	**470**	**930**	**1900**
DG-Y3	3.5-4	DG-Y3-3.5-4	12/18/2018	**2.4**	**4.3**	**25**	**2.9**	**22**	<3.5	<4.2	**9**	<5.0	<2.8	<2.4	<2.0	**5.3**	<3.5	**11**	<2.2	**7.3**	**35**	**9**	**2.1**	<10
DG-Y7	0.5-1	DG-Y7-0.5-1	1/9/2019	**31**	**32**	**53**	**18**	**47**	**4.6**	**15**	**47**	**11**	**3.7**	**4.4**	**14**	**17**	**4.6**	**70**	**3**	**12**	**49**	**68**	**25**	**43**
DG-Y7	3.5-4	DG-Y7-3.5-4	1/9/2019	**11**	**7.5**	**18**	**6.2**	**29**	<3.4	<4.1	**12**	**22**	<2.7	**4.4**	**6.8**	<4.2	<3.4	**35**	**3.9**	**73**	**68**	**34**	**59**	**110**
DG-Z13	0.5-1	DG-Z13-0.5-1	1/28/2019	<15	**24**	**32**	**24**	<14	<35	<42	**48**	**110**	<28	<24	**29**	<43	<35	**21**	<22	**37**	**86**	**40**	**1000**	**200**

Table 3: Polynuclear Aromatic Hydrocarbons and Total Petroleum Hydrocarbons as Diesel and Motor Oil Concentrations in Soil
UPC OU-2
Brisbane, California

Sample Location	Depth Range (ft bgs)	Sample Name	Collection Date	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Chrysene	Dibenzo(a,h)anthracene	Indeno(1,2,3-cd)pyrene	Benzo(a)pyrene Equivalent Total PAHs [4]	2-Methylnaphthalene	Acenaphthene	Acenaphthylene	Anthracene	Benzo(g,h,i)perylene	Dibenzo(a,h)anthracene	Fluoranthene	Fluorene	Naphthalene	Phenanthrene	Pyrene	TPH-Diesel (C10-C28)	TPH-Motor Oil (C24-C36)
Direct Exposure Human Health Risk Level Residential Soil Exposure ESL [1]				1.1E+03	1.1E+02	1.1E+03	1.1E+04	1.1E+05	1.1E+02	1.1E+03	--	2.4E+05	3.6E+06	--	1.8E+07	--	1.1E+02	2.4E+06	2.4E+06	3.8E+03	--	1.8E+06	2.6E+02	1.2E+04
Leaching to Groundwater Levels Non-drinking Water ESL [2]				1.0E+04	5.7E+03	7.5E+04	3.9E+04	1.0E+04	3.9E+05	3.2E+04	--	8.8E+02	1.2E+04	6.4E+03	1.9E+03	2.7E+04	3.9E+05	8.6E+04	6.0E+03	1.2E+03	1.1E+04	4.5E+04	7.3E+03	--
Regional Background [3]				--	--	--	--	--	--	--	4.0E+02	--	--	--	--	--	--	--	--	--	--	--	--	--
Units				µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	mg/kg	mg/kg
DG-Z13	3.5-4	DG-Z13-3.5-4	1/28/2019	<7.3	**18**	**40**	**15**	**21**	<17	<21	**32**	**150**	<14	**12**	**25**	**21**	<17	**20**	**37**	**35**	**54**	**36**	**290**	**280**
DG-Z17	0.5-1	DG-Z17-0.5-1	1/28/2019	<74	**350**	**200**	**120**	<69	<170	<210	**470**	<250	<140	<120	<99	<210	<170	**87**	<110	<170	<89	**210**	**400**	**1200**
DG-Z17 (D)	0.5-1	DG-Z17 (D)-0.5-1	1/28/2019	<30	**99**	**110**	**65**	**40**	<69	<83	**151**	<98	<55	<47	**52**	**110**	<69	**64**	<43	<69	**43**	**110**	**590**	**1300**
DG-Z17	3.5-4	DG-Z17-3.5-4	1/28/2019	<150	**220**	**230**	**210**	<140	<350	<420	**449**	<500	<280	<240	<200	<430	<350	<140	<220	<350	<180	<170	**1300**	**4800**
DG-Z17	7.5-8	DG-Z17-7.5-8	1/28/2019	<71	**130**	**140**	**110**	<67	<170	<200	**244**	**390**	**350**	**130**	**190**	<200	<170	**100**	<100	<170	**550**	**290**	**1800**	**990**
DG-Z5	0.5-1	DG-Z5-0.5-1	1/8/2019	**140**	**190**	**230**	**93**	**180**	**24**	**67**	**259**	**55**	<11	**48**	**61**	**79**	**24**	**180**	<8.7	**85**	**93**	**330**	**70**	**190**
DG-Z5	3.5-4	DG-Z5-3.5-4	1/8/2019	<1.5	<1.9	**3.4**	<2.1	**1.8**	<3.5	<4.2	**3**	<5.0	<2.8	<2.4	<2.0	<4.3	<3.5	**2.2**	<2.2	<3.5	**2.5**	**2.4**	**5.6**	**12**
DG-Z9	0.5-1	DG-Z9-0.5-1	1/9/2019	**39**	**50**	**93**	**29**	**45**	<17	**23**	**74**	<24	<13	**24**	**41**	**33**	<17	**56**	<10	**21**	**30**	**65**	**100**	**190**
DG-Z9 (D)	0.5-1	DG-Z9 (D)-0.5-1	1/9/2019	**19**	**21**	**38**	**12**	**27**	<6.8	**14**	**32**	<9.8	<5.5	**12**	**22**	**27**	<6.8	**59**	<4.3	**11**	**31**	**52**	**62**	**130**
DG-Z9	3.5-4	DG-Z9-3.5-4	1/9/2019	**4**	<1.8	**19**	**4**	**29**	<3.4	<4.1	**5**	**15**	<2.7	<2.3	**2.6**	<4.2	<3.4	**29**	**2.1**	**41**	**56**	**17**	**31**	**58**

Notes:

1. San Francisco Bay RWQCB, 2019. Summary of Soil ESLs, Jan. 2019 (Rev. 1) - Direct Exposure Human Health Risk Levels (Table S-1) Res: Shallow Soil Exposure.
2. San Francisco Bay RWQCB, 2019. Summary of Soil ESLs, Jan. 2019 (Rev. 1) - Leaching to Groundwater Levels (Table S-3) Non-drinking Water.
3. Benzo(a)pyrene: RWQCB, 2017. Letter from Vic Pal to Howard Pearce Re Concurrence with Proposed Revisions to the Baylands Soil Processing Acceptance Criteria, Brisbane Landfill, San Mateo County. 14 September.
4. Total PAHs calculated based on the PEA Guidance Manual, Potency Equivalecy Factors for PAHs - Table 2-4.
5. The lower RWQCB ESL is used as comparison criteria when available unless the regional background is higher, in which case regional background is used as the comparison criteria. The carcinogenic PAHs (benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene and indeno(1,2,3-cd)pyrene) were converted to total PAHs and that comparison criteria was used rather than individual ESLs.
6. PAHs analyzed by USEPA Method 8270C SIM
7. TPH-diesel and TPH-motor oil analyzed by USEPA Method 8015B
8. Non-detect results are presented with "<" followed by the MDL.
9. Results in bold font indicate a detection above the MDL.
10. Gray shading indicates a detection above the comparison criteria.

Abbreviations, and Symbols:

"--" - Not Available
"<" - Non-detect result
(D) - Duplicate sample
ft bgs - Feet below ground surface
MDL - Method Detection Limit
mg/kg - milligram per kilogram
MDL - Method Detection Limit
SIM - selective ion monitoring
TPH - Total petroleum hydrocarbon
ESL - Environmental Screening Level
RWQCB - Regional Water Quality Control Board
USEPA - United States Environmental Protection Agency

Table 4: Organochlorine Pesticides and Polychlorinated Biphenyls
Concentrations in Soil
UPC OU-2
Brisbane, California

Sample Location	Depth Range (ft bgs)	Sample Name	Collection Date	4,4'-DDD	4,4'-DDE	4,4'-DDT	alpha-BHC	alpha-Chlordane	beta-BHC	Chlordane	Dieldrin	Endrin	Endrin aldehyde	Endrin ketone	gamma-BHC (Lindane)	gamma-Chlordane	PCB-1254 (Aroclor 1254)	PCB-1260 (Aroclor 1260)
Direct Exposure Human Health Risk Level Residential Soil Exposure ESL [1]				2.7E+03	1.8E+03	1.9E+03	--	--	--	4.8E+02	3.7E+01	2.1E+04	--	--	5.50E+02	--	2.30E+02	
Leaching to Groundwater Levels Non-drinking Water ESL [2]				6.5E+04	2.9E+04	5.6E+03	--	--	--	2.3E+04	6.3E+00	7.6E+00	--	--	7.4E+00	--	3.3E+05	
EPA RSL for Resident Soil [3]				1.9E+03	2.0E+03	1.9E+03	8.6E+01	--	3.0E+02	1.7E+03	3.4E+01	1.9E+04	--	--	5.7E+02	--	2.4E+02	2.4E+02
Units				µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg
DG-AA11	0.5-1	DG-AA11S-0.5-1	1/29/2019	<0.61	<0.42	<0.41	<0.55	<0.40	<0.36	<3.2	<0.59	<0.46	<0.63	<0.33	<0.63	<0.46	<17	<17
DG-AA11	3.5-4	DG-AA11S-3.5-4	1/29/2019	<0.60	<0.41	<0.40	<0.54	<0.39	<0.35	<3.2	<0.58	<0.45	<0.62	<0.33	<0.62	<0.45	<17	<17
DG-AA15	0.5-1	DG-AA15S-0.5-1	1/22/2019	<1.1	<0.79	<0.77	<1.0	<0.75	<0.68	<5.5	<1.1	<0.87	<1.2	<0.62	<1.2	<0.87	<17	<17
DG-AA19	0.5-1	DG-AA19S-0.5-1	1/24/2019	<1.5	<1.5	<1.5	<1.5	<2.0	<1.5	<9.9	<1.5	<1.5	<1.5	<2.0	<1.5	<1.5	<17	<17
DG-AA19	3.5-4	DG-AA19S-3.5-4	1/24/2019	<1.5	<1.5	<1.5	<1.5	<2.0	<1.5	<9.9	<1.5	<1.5	<1.5	<2.0	<1.5	<1.5	<17	<17
DG-AA19	8.5-9	DG-AA19S-8.5-9	1/24/2019	<1.5	<1.5	<1.5	<1.5	<2.0	<1.5	<9.8	<1.5	<1.5	<1.5	<2.0	<1.5	<1.5	<17	<17
DG-AA3	0.5-1	DG-AA3S-0.5-1	2/5/2019	**1.7**	**1.9**	**3.8**	<0.52	**0.57**	<0.34	**9.7**	**2.0**	<0.44	<0.60	<0.31	<0.60	**0.82**	<17	**270**
DG-AA3	3.5-4	DG-AA3S-3.5-4	2/5/2019	<0.60	<0.41	<0.40	<0.54	<0.39	<0.36	<3.2	<0.58	<0.45	<0.62	<0.33	<0.62	<0.45	<17	**19**
DG-AA3	7-7.5	DG-AA3S-7-7.5	2/5/2019	<0.58	<0.40	<0.39	<0.52	<0.38	<0.34	<3.0	<0.56	<0.44	<0.60	<0.31	<0.60	<0.44	<17	<17
DG-AA7	0.5-1	DG-AA7S-0.5-1	1/9/2019	**2.2**	**1.3**	**4.7**	<0.54	**0.67**	<0.35	<3.1	**4.9**	<0.45	<0.62	<0.32	<0.62	**0.9**	<17	**710**
DG-AA7	3.5-4	DG-AA7S-3.5-4	1/9/2019	<0.60	<0.41	<0.40	<0.54	<0.39	<0.36	<3.2	<0.58	<0.45	<0.62	<0.33	<0.62	<0.45	<17	**21**
DG-AB13	0.5-1	DG-AB13S-0.5-1	1/22/2019	<0.59	<0.41	<0.40	<0.53	<0.39	<0.35	<2.8	<0.57	<0.44	<0.61	<0.32	<0.61	<0.44	<17	<17
DG-AB13	3.5-4	DG-AB13S-3.5-4	1/22/2019	<0.59	<0.40	<0.39	<0.53	<0.38	<0.35	<3.1	<0.57	<0.44	<0.61	<0.32	<0.61	<0.44	<17	<17
DG-AB13 (D)	3.5-4	DG-AB13 (D)S-3.5-4	1/22/2019	<0.60	<0.41	<0.40	<0.54	<0.39	<0.35	<3.1	<0.58	<0.45	<0.62	<0.32	<0.62	<0.45	<17	<17
DG-AB13	13.5-14	DG-AB13S-13.5-14	1/22/2019	<12	<8.0	<7.8	<10	<7.6	<6.9	<61	<11	<8.8	<12	<6.3	<12	<8.8	<150	<150
DG-AB17	0.5-1	DG-AB17S-0.5-1	1/24/2019	<1.5	<1.5	**3.4**	<1.5	**3.1**	<1.5	**38**	<1.5	<1.5	<1.5	<2.0	<1.5	**3.0**	<17	**43**
DG-AB17	3.5-4	DG-AB17S-3.5-4	1/24/2019	<1.5	**1.6**	<1.5	<1.5	<1.9	<1.5	<9.7	<1.5	<1.5	<1.5	<1.9	<1.5	<1.5	<17	<17
DG-AB5	0.5-1	DG-AB5S-0.5-1	1/29/2019	<0.60	<0.42	<0.41	<0.54	<0.40	<0.36	<3.2	<0.58	<0.45	<0.62	<0.33	<0.62	<0.45	<17	<17
DG-AB5 (D)	0.5-1	DG-AB5 (D)S-0.5-1	1/29/2019	<0.60	<0.41	<0.40	<0.54	<0.39	<0.35	<3.1	<0.58	<0.45	<0.62	<0.32	<0.62	<0.45	<17	<17
DG-AB5	3.5-4	DG-AB5S-3.5-4	1/29/2019	<0.60	<0.41	<0.40	<0.54	<0.39	<0.35	<3.1	<0.58	<0.45	<0.62	<0.32	<0.62	<0.45	<17	<17
DG-AB9	0.5-1	DG-AB9S-0.5-1	1/30/2019	<1.5	<1.5	<1.5	<1.5	<2.0	<1.5	<9.9	<1.5	<1.5	<1.5	<2.0	<1.5	<1.5	<17	<17
DG-AB9	3.5-4	DG-AB9S-3.5-4	1/30/2019	<1.5	<1.5	<1.5	<1.5	<2.0	<1.5	<9.8	<1.5	<1.5	<1.5	<2.0	<1.5	<1.5	<17	<17
DG-AC11	0.5-1	DG-AC11S-0.5-1	1/29/2019	**4.2**	**1.8**	<0.40	<0.54	<0.39	<0.35	<3.1	<0.58	<0.45	<0.62	<0.32	<0.62	<0.45	<17	<17
DG-AC11	3.5-4	DG-AC11S-3.5-4	1/29/2019	<6.0	<4.1	<4.0	<5.4	<3.9	<3.5	<31	<5.8	<4.5	<6.2	<3.2	<6.2	<4.5	<17	<17
DG-AC11	8.5-9	DG-AC11S-8.5-9	1/29/2019	<0.59	<0.41	<0.40	<0.54	<0.39	<0.35	<3.1	<0.57	<0.45	<0.61	<0.32	<0.61	<0.45	<17	<17
DG-AC15	0.5-1	DG-AC15S-0.5-1	1/31/2019	<1.5	<1.5	<1.5	<1.5	<2.0	<1.5	<9.9	<1.5	<1.5	<1.5	<2.0	<1.5	<1.5	<17	<17
DG-AC15 (D)	0.5-1	DG-AC15 (D)S-0.5-1	1/31/2019	<1.5	<1.5	<1.5	<1.5	<1.9	<1.5	<9.7	<1.5	<1.5	<1.5	<1.9	<1.5	<1.5	<17	**18**
DG-AC15	3.5-4	DG-AC15S-3.5-4	1/31/2019	<1.5	<1.5	<1.5	<1.5	<2.0	<1.5	<9.8	<1.5	<1.5	<1.5	<2.0	<1.5	<1.5	<17	<17
DG-AC15	7.5-8	DG-AC15S-7.5-8	1/31/2019	<3.0	<3.0	<3.0	<3.0	<4.0	<3.0	<20	<3.0	<3.0	<3.0	<4.0	<3.0	<3.0	<34	<34
DG-AC3	0.5-1	DG-AC3S-0.5-1	12/19/2018	<0.58	<0.40	<0.39	<0.52	<0.38	<0.34	<3.1	<0.56	<0.44	<0.60	<0.31	<0.60	<0.44	<17	<17
DG-AC3	3.5-4	DG-AC3S-3.5-4	12/19/2018	<0.61	<0.42	<0.41	<0.55	<0.40	<0.36	<2.9	<0.59	<0.46	<0.63	<0.33	<0.63	<0.46	<17	**23**
DG-AC7	0.5-1	DG-AC7S-0.5-1	1/9/2019	<0.60	**0.48**	<0.40	<0.54	<0.39	<0.35	<3.1	<0.58	<0.45	<0.62	<0.32	<0.62	<0.45	<16	**190**
DG-AC7 (D)	0.5-1	DG-AC7 (D)S-0.5-1	1/9/2019	<0.60	**0.89**	<0.40	<0.54	<0.39	<0.36	<3.2	<0.58	<0.45	<0.62	<0.33	<0.62	<0.45	<16	**120**
DG-AC7	3.5-4	DG-AC7S-3.5-4	1/9/2019	<3.0	<2.1	<2.0	<2.7	<2.0	<1.8	<16	<2.9	<2.3	<3.1	<1.6	<3.1	<2.3	<17	<17
DG-AC7	7.5-8	DG-AC7S-7.5-8	1/9/2019	<0.60	<0.41	<0.40	<0.54	<0.39	<0.35	<3.1	<0.58	<0.45	<0.62	<0.32	<0.62	<0.45	<17	<17

Table 4: Organochlorine Pesticides and Polychlorinated Biphenyls Concentrations in Soil

UPC OU-2

Brisbane, California

Sample Location	Depth Range (ft bgs)	Sample Name	Collection Date	4,4'-DDD	4,4'-DDE	4,4'-DDT	alpha-BHC	alpha-Chlordane	beta-BHC	Chlordane	Dieldrin	Endrin	Endrin aldehyde	Endrin ketone	gamma-BHC (Lindane)	gamma-Chlordane	PCB-1254 (Aroclor 1254)	PCB-1260 (Aroclor 1260)
Direct Exposure Human Health Risk Level Residential Soil Exposure ESL [1]				2.7E+03	1.8E+03	1.9E+03	--	--	--	4.8E+02	3.7E+01	2.1E+04	--	--	5.50E+02	--	2.30E+02	
Leaching to Groundwater Levels Non-drinking Water ESL [2]				6.5E+04	2.9E+04	5.6E+03	--	--	--	2.3E+04	6.3E+00	7.6E+00	--	--	7.4E+00	--	3.3E+05	
EPA RSL for Resident Soil [3]				1.9E+03	2.0E+03	1.9E+03	8.6E+01	--	3.0E+02	1.7E+03	3.4E+01	1.9E+04	--	--	5.7E+02	--	2.4E+02	2.4E+02
Units				µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg
DG-AD13	0.5-1	DG-AD13S-0.5-1	2/1/2019	<1.2	<0.82	**5.1**	<1.1	**1.2**	<0.70	<6.3	<1.2	<0.90	<1.2	<0.65	<1.2	<0.90	<17	<17
DG-AD13	3.5-4	DG-AD13S-3.5-4	2/1/2019	<3.0	<2.0	<2.0	<2.7	<1.9	<1.8	<16	<2.9	<2.2	<3.1	<1.6	<3.1	<2.2	<17	<17
DG-AD13	7.5-8	DG-AD13S-7.5-8	2/1/2019	<6.1	<4.2	<4.1	<5.5	<4.0	<3.6	<32	<5.9	<4.6	<6.3	<3.3	<6.3	<4.6	<17	<17
DG-AD13 (D)	7.5-8	DG-AD13 (D)S-7.5-8	2/1/2019	<12	<8.3	<8.1	<11	<7.9	<7.1	<63	<12	<9.1	<12	<6.5	<12	<9.1	<17	<17
DG-AD17	0.5-1	DG-AD17S-0.5-1	1/24/2019	<1.5	<1.5	<1.5	<1.5	<2.0	<1.5	<9.8	<1.5	<1.5	<1.5	<2.0	<1.5	<1.5	<17	<17
DG-AD17	3.5-4	DG-AD17S-3.5-4	1/24/2019	<1.5	<1.5	<1.5	<1.5	<2.0	<1.5	<10	<1.5	<1.5	<1.5	<2.0	<1.5	<1.5	<17	<17
DG-AD17	7-7.5	DG-AD17S-7-7.5	1/24/2019	<1.5	<1.5	<1.5	<1.5	<2.0	<1.5	<9.9	<1.5	<1.5	<1.5	<2.0	<1.5	<1.5	<17	<17
DG-AD5	0.5-1	DG-AD5S-0.5-1	1/8/2019	<0.60	<0.41	<0.40	<0.54	<0.39	<0.36	<3.2	<0.58	<0.45	<0.62	<0.33	<0.62	<0.45	<17	**99**
DG-AD5	3.5-4	DG-AD5S-3.5-4	1/8/2019	<0.60	<0.41	<0.40	<0.54	<0.39	<0.35	<2.8	<0.58	<0.45	<0.62	<0.32	<0.62	<0.45	<17	<17
DG-AD9	0.5-1	DG-AD9S-0.5-1	1/9/2019	**9.0**	**4.9**	**12**	<0.53	<0.38	<0.34	<3.1	**6.6**	**12**	<0.60	<0.32	<0.60	<0.44	<17	**200**
DG-AD9	3.5-4	DG-AD9S-3.5-4	1/9/2019	<0.60	<0.41	<0.40	**1.0**	<0.39	<0.35	<3.1	<0.58	<0.45	<0.62	<0.32	<0.62	<0.45	<17	<17
DG-AE11	0.5-1	DG-AE11S-0.5-1	1/21/2019	<0.59	<0.41	<0.40	<0.53	<0.39	<0.35	<2.8	<0.57	<0.45	<0.61	<0.32	<0.61	<0.45	<17	<17
DG-AE11	3.5-4	DG-AE11S-3.5-4	1/21/2019	<1.2	<0.81	<0.79	<1.1	<0.77	<0.69	<5.6	<1.1	<0.88	<1.2	<0.63	<1.2	<0.88	<17	<17
DG-AE3	0.5-1	DG-AE3S-0.5-1	12/19/2018	<0.61	<0.42	<0.41	<0.55	<0.40	<0.36	<3.2	<0.59	<0.46	<0.63	<0.33	<0.63	<0.46	<17	<17
DG-AE3	3.5-4	DG-AE3S-3.5-4	12/19/2018	<0.60	<0.42	<0.41	<0.54	<0.40	<0.36	<3.2	<0.58	<0.46	<0.62	<0.33	<0.62	<0.46	<17	<17
DG-AE7	0.5-1	DG-AE7S-0.5-1	1/9/2019	<0.60	<0.41	<0.40	<0.54	<0.39	<0.35	<3.1	<0.58	<0.45	<0.62	<0.32	<0.62	<0.45	<17	<17
DG-AE7	3.5-4	DG-AE7S-3.5-4	1/9/2019	<0.60	<0.41	<0.40	<0.54	<0.39	<0.35	<3.2	<0.58	<0.45	<0.62	<0.33	<0.62	<0.45	<17	<17
DG-AE7	8-8.5	DG-AE7S-8-8.5	1/9/2019	<0.60	<0.41	<0.40	<0.54	<0.39	<0.35	<3.1	<0.58	<0.45	<0.62	<0.32	<0.62	<0.45	<17	<17
DG-AF13	0.5-1	DG-AF13S-0.5-1	11/21/2018	<12	<8.3	<8.1	<11	<7.9	<7.1	<63	<12	<9.1	<12	<6.5	<12	<9.1	<34	<34
DG-AF13	0.5-1	DG-AF13S-0.5-1	1/28/2019	<1.2	**2.2**	**14**	<1.1	**4.5**	<0.71	**64**	<1.2	<0.91	<1.2	<0.65	<1.2	**4.5**	<17	**41**
DG-AF13	3.5-4	DG-AF13S-3.5-4	11/21/2018	<29	<20	**42**	<26	<19	<17	<150	<28	<22	<30	<16	<30	<22	<34	<34
DG-AF13	3.5-4	DG-AF13S-3.5-4	1/28/2019	<0.60	<0.41	<0.40	<0.54	<0.39	<0.35	<3.2	<0.58	<0.45	<0.62	<0.33	<0.62	<0.45	<17	<17
DG-AF13	7-7.5	DG-AF13S-7-7.5	11/21/2018	<5.9	<4.0	<3.9	<5.3	<3.9	<3.5	<31	<5.7	<4.4	<6.1	<3.2	<6.1	<4.4	<17	<17
DG-AF5	0.5-1	DG-AF5S-0.5-1	1/8/2019	**4.2**	**4.4**	**9.2**	<0.53	**11**	<0.35	**110**	<0.57	<0.44	<0.61	<0.32	<0.61	**11**	<17	**600**
DG-AF5	3.5-4	DG-AF5S-3.5-4	1/8/2019	<0.58	<0.40	<0.39	<0.52	<0.38	<0.34	<2.7	<0.56	<0.44	<0.60	<0.31	<0.60	<0.44	<17	<17
DG-AG11	0.5-1	DG-AG11S-0.5-1	1/21/2019	**3.3**	<0.79	**3.4**	<1.0	**2.1**	<0.68	<6.0	<1.1	<0.86	<1.2	<0.62	<1.2	**2.4**	<17	**28**
DG-AG11	3.5-4	DG-AG11S-3.5-4	1/21/2019	<0.58	<0.40	<0.39	<0.52	<0.38	<0.34	<3.1	<0.56	<0.44	<0.60	<0.31	<0.60	<0.44	<17	<17
DG-AG11	9.5-10	DG-AG11S-9.5-10	1/21/2019	<0.60	<0.42	<0.41	<0.54	<0.40	<0.36	<3.2	<0.58	<0.45	<0.62	<0.33	<0.62	<0.45	<17	<17
DG-AG15	0.5-1	DG-AG15S-0.5-1	1/24/2019	<1.5	<1.5	<1.5	<1.5	**2.2**	<1.5	**35**	<1.5	<1.5	<1.5	<2.0	<1.5	**3.5**	<17	<17
DG-AG15	3.5-4	DG-AG15S-3.5-4	1/24/2019	<1.5	<1.5	<1.5	<1.5	<2.0	<1.5	<9.9	<1.5	<1.5	<1.5	<2.0	<1.5	<1.5	<17	<17
DG-AG15	8.5-9	DG-AG15S-8.5-9	1/24/2019	<1.5	<1.5	<1.5	<1.5	<2.0	<1.5	<9.9	<1.5	<1.5	<1.5	<2.0	<1.5	<1.5	<17	<17
DG-AG3	0.5-1	DG-AG3S-0.5-1	12/19/2018	<0.59	<0.41	<0.40	<0.53	<0.39	<0.35	<3.1	<0.57	<0.45	<0.61	<0.32	<0.61	<0.45	<17	<17
DG-AG3	3.5-4	DG-AG3S-3.5-4	12/19/2018	<0.61	<0.42	<0.41	<0.55	<0.40	<0.36	<3.2	<0.59	<0.46	<0.63	<0.33	<0.63	<0.46	<17	<17
DG-AG7	0.5-1	DG-AG7S-0.5-1	1/30/2019	**1.8**	**4.4**	**2.7**	<1.5	<2.0	<1.5	<10	<1.5	<1.5	<1.5	<2.0	<1.5	<1.5	**120**	**110**
DG-AG7	3.5-4	DG-AG7S-3.5-4	1/30/2019	<1.5	<1.5	<1.5	<1.5	<2.0	<1.5	<9.8	<1.5	<1.5	<1.5	<2.0	<1.5	<1.5	<17	<17

Table 4: Organochlorine Pesticides and Polychlorinated Biphenyls
Concentrations in Soil
UPC OU-2
Brisbane, California

Sample Location	Depth Range (ft bgs)	Sample Name	Collection Date	4,4'-DDD	4,4'-DDE	4,4'-DDT	alpha-BHC	alpha-Chlordane	beta-BHC	Chlordane	Dieldrin	Endrin	Endrin aldehyde	Endrin ketone	gamma-BHC (Lindane)	gamma-Chlordane	PCB-1254 (Aroclor 1254)	PCB-1260 (Aroclor 1260)
Direct Exposure Human Health Risk Level Residential Soil Exposure ESL [1]				2.7E+03	1.8E+03	1.9E+03	--	--	--	4.8E+02	3.7E+01	2.1E+04	--	--	5.50E+02	--	2.30E+02	
Leaching to Groundwater Levels Non-drinking Water ESL [2]				6.5E+04	2.9E+04	5.6E+03	--	--	--	2.3E+04	6.3E+00	7.6E+00	--	--	7.4E+00	--	3.3E+05	
EPA RSL for Resident Soil [3]				1.9E+03	2.0E+03	1.9E+03	8.6E+01	--	3.0E+02	1.7E+03	3.4E+01	1.9E+04	--	--	5.7E+02	--	2.4E+02	2.4E+02
Units				µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg
DG-AH13	0.5-1	DG-AH13S-0.5-1	1/29/2019	<1.2	<0.83	<0.81	<1.1	<0.79	<0.71	<6.3	<1.2	<0.91	<1.2	<0.65	<1.2	<0.91	<17	<17
DG-AH13	3.5-4	DG-AH13S-3.5-4	1/29/2019	<6.0	<4.2	<4.1	<5.4	<4.0	<3.6	<32	<5.8	<4.6	<6.2	<3.3	<6.2	<4.6	<17	<17
DG-AH13	7.5-8	DG-AH13S-7.5-8	1/29/2019	<6.1	<4.2	<4.1	<5.5	<4.0	<3.6	<32	<5.9	<4.6	<6.3	<3.3	<6.3	<4.6	<34	<34
DG-AH17	0.5-1	DG-AH17S-0.5-1	1/24/2019	<1.5	<1.5	<1.5	<1.5	<2.0	<1.5	<9.8	<1.5	<1.5	<1.5	<2.0	<1.5	<1.5	<17	<17
DG-AH5	0.5-1	DG-AH5S-0.5-1	1/8/2019	<0.58	<0.40	<0.39	<0.53	<0.38	<0.34	<2.8	<0.56	<0.44	<0.60	<0.32	<0.60	<0.44	<17	**17**
DG-AH5	3.5-4	DG-AH5S-3.5-4	1/8/2019	<0.58	<0.40	<0.39	<0.52	<0.38	<0.34	<3.0	<0.56	<0.43	<0.59	<0.31	<0.59	<0.43	<17	<17
DG-AH5	8-8.5	DG-AH5S-8-8.5	1/8/2019	<0.58	<0.40	<0.39	<0.52	<0.38	<0.34	<2.7	<0.56	<0.43	<0.59	<0.31	<0.59	<0.43	<17	<17
DG-AH9	0.5-1	DG-AH9S-0.5-1	1/30/2019	<1.5	<1.5	**2.2**	<1.5	<2.0	<1.5	<9.8	**1.6**	<1.5	<1.5	<2.0	<1.5	<1.5	<17	**38**
DG-AH9	3.5-4	DG-AH9S-3.5-4	1/30/2019	<1.5	<1.5	<1.5	<1.5	<2.0	<1.5	<9.8	<1.5	<1.5	<1.5	<2.0	<1.5	<1.5	<17	<17
DG-AI11	0.5-1	DG-AI11S-0.5-1	1/21/2019	<0.60	<0.41	<0.40	<0.54	<0.39	<0.35	<3.1	<0.58	<0.45	<0.62	<0.32	<0.62	<0.45	<17	<17
DG-AI11 (D)	0.5-1	DG-AI11 (D)S-0.5-1	1/21/2019	**1.3**	<0.41	<0.40	<0.54	<0.39	<0.35	<3.1	<0.58	<0.45	<0.62	<0.32	<0.62	<0.45	<17	<17
DG-AI11	3.5-4	DG-AI11S-3.5-4	1/21/2019	<3.0	<2.1	<2.0	<2.7	<2.0	<1.8	<14	<2.9	<2.3	<3.1	<1.6	<3.1	<2.3	<17	<17
DG-AI11	9.5-10	DG-AI11S-9.5-10	1/21/2019	<6.1	<4.2	<4.1	<5.5	<4.0	<3.6	<29	<5.9	<4.6	<6.3	<3.3	<6.3	<4.6	<17	<17
DG-AI15	0.5-1	DG-AI15S-0.5-1	1/24/2019	**2.9**	**4.4**	**6.3**	<1.5	<1.9	<1.5	<9.7	<1.5	<1.5	<1.5	<1.9	<1.5	<1.5	**130**	**70**
DG-AI15	3.5-4	DG-AI15S-3.5-4	1/24/2019	<1.5	<1.5	<1.5	<1.5	<2.0	<1.5	<9.9	<1.5	<1.5	<1.5	<2.0	<1.5	<1.5	<17	<17
DG-AI15 (D)	3.5-4	DG-AI15 (D)S-3.5-4	1/24/2019	<1.5	<1.5	<1.5	<1.5	<2.0	<1.5	<9.9	<1.5	<1.5	<1.5	<2.0	<1.5	<1.5	<17	<17
DG-AI3	0.5-1	DG-AI3S-0.5-1	12/19/2018	<0.59	<0.41	<0.40	<0.53	<0.39	<0.35	<2.8	<0.57	<0.45	<0.61	<0.32	<0.61	<0.45	<17	<17
DG-AI3	3.5-4	DG-AI3S-3.5-4	12/19/2018	<0.58	<0.40	<0.39	<0.53	<0.38	<0.34	<2.8	<0.56	<0.44	<0.60	<0.32	<0.60	<0.44	<17	<17
DG-AI3 (D)	3.5-4	DG-AI3 (D)S-3.5-4	12/19/2018	<0.58	<0.40	<0.39	<0.52	<0.38	<0.34	<3.0	<0.56	<0.44	<0.60	<0.31	<0.60	<0.44	<17	<17
DG-AI7	0.5-1	DG-AI7S-0.5-1	1/9/2019	**12**	**12**	**31**	<0.54	<0.39	<0.35	<3.1	**14**	**26**	<0.62	<0.32	<0.62	<0.45	<170	**1500**
DG-AI7	3.5-4	DG-AI7S-3.5-4	1/9/2019	<0.60	<0.41	<0.40	<0.54	<0.39	<0.35	<3.1	<0.58	<0.45	<0.62	<0.32	<0.62	<0.45	<17	<17
DG-AI7	8-8.5	DG-AI7S-8-8.5	1/9/2019	<0.61	<0.42	<0.41	<0.55	<0.40	<0.36	<3.2	<0.59	<0.46	<0.63	<0.33	<0.63	<0.46	<17	<17
DG-AJ13	0.5-1	DG-AJ13S-0.5-1	1/29/2019	<6.0	<4.2	<4.1	<5.5	<4.0	<3.6	<32	<5.8	<4.6	<6.2	<3.3	<6.2	<4.6	<17	<17
DG-AJ13	3.5-4	DG-AJ13S-3.5-4	1/29/2019	<0.60	<0.41	<0.40	<0.54	<0.39	<0.36	<3.2	<0.58	<0.45	<0.62	<0.33	<0.62	<0.45	<17	<17
DG-AJ17	0.5-1	DG-AJ17S-0.5-1	1/24/2019	<1.5	<1.5	<1.5	<1.5	<2.0	<1.5	<9.8	<1.5	<1.5	<1.5	<2.0	<1.5	<1.5	<17	<17
DG-AJ17	3.5-4	DG-AJ17S-3.5-4	1/24/2019	<1.5	<1.5	<1.5	<1.5	<2.0	<1.5	<9.9	<1.5	<1.5	<1.5	<2.0	<1.5	<1.5	<17	<17
DG-AJ17	9.5-10	DG-AJ17S-9.5-10	1/24/2019	<1.5	<1.5	<1.5	<1.5	<2.0	<1.5	<10	<1.5	<1.5	<1.5	<2.0	<1.5	<1.5	<17	<17
DG-AJ5	0.5-1	DG-AJ5S-0.5-1	1/8/2019	<0.60	**0.44**	<0.40	<0.54	<0.39	<0.35	<2.8	<0.58	<0.45	<0.62	<0.32	<0.62	<0.45	<17	**320**
DG-AJ5	3.5-4	DG-AJ5S-3.5-4	1/8/2019	<0.60	<0.41	<0.40	<0.54	<0.39	<0.35	<3.1	<0.58	<0.45	<0.62	<0.32	<0.62	<0.45	<17	<17
DG-AJ9	0.5-1	DG-AJ9S-0.5-1	1/30/2019	<1.5	**1.6**	**54**	<1.5	<2.0	<1.5	<9.9	**4.4**	<1.5	<1.5	<2.0	<1.5	<1.5	<17	**820**
DG-AJ9	3.5-4	DG-AJ9S-3.5-4	1/30/2019	<1.5	<1.5	<1.5	<1.5	<2.0	<1.5	<9.8	<1.5	<1.5	<1.5	<2.0	<1.5	<1.5	<17	<17
DG-AK11	0.5-1	DG-AK11S-0.5-1	1/22/2019	<0.60	<0.41	<0.40	<0.54	<0.39	<0.35	<2.9	<0.58	<0.45	<0.62	<0.33	<0.62	<0.45	<17	<17
DG-AK11	3.5-4	DG-AK11S-3.5-4	1/22/2019	<12	<8.0	<7.8	<11	<7.6	<6.9	<55	<11	<8.8	<12	<6.3	<12	<8.8	<17	<17
DG-AK15	0.5-1	DG-AK15S-0.5-1	1/23/2019	<1.5	<1.5	<1.5	<1.5	<2.0	<1.5	<9.9	<1.5	<1.5	<1.5	<2.0	<1.5	<1.5	<17	<17
DG-AK15	3.5-4	DG-AK15S-3.5-4	1/23/2019	<1.5	<1.5	<1.5	<1.5	<2.0	<1.5	<9.9	<1.5	<1.5	<1.5	<2.0	<1.5	<1.5	<17	<17

Table 4: Organochlorine Pesticides and Polychlorinated Biphenyls
Concentrations in Soil
UPC OU-2
Brisbane, California

Sample Location	Depth Range (ft bgs)	Sample Name	Collection Date	4,4'-DDD	4,4'-DDE	4,4'-DDT	alpha-BHC	alpha-Chlordane	beta-BHC	Chlordane	Dieldrin	Endrin	Endrin aldehyde	Endrin ketone	gamma-BHC (Lindane)	gamma-Chlordane	PCB-1254 (Aroclor 1254)	PCB-1260 (Aroclor 1260)
Direct Exposure Human Health Risk Level Residential Soil Exposure ESL [1]				2.7E+03	1.8E+03	1.9E+03	--	--	--	4.8E+02	3.7E+01	2.1E+04	--	--	5.50E+02	--	2.30E+02	
Leaching to Groundwater Levels Non-drinking Water ESL [2]				6.5E+04	2.9E+04	5.6E+03	--	--	--	2.3E+04	6.3E+00	7.6E+00	--	--	7.4E+00	--	3.3E+05	
EPA RSL for Resident Soil [3]				1.9E+03	2.0E+03	1.9E+03	8.6E+01	--	3.0E+02	1.7E+03	3.4E+01	1.9E+04	--	--	5.7E+02	--	2.4E+02	2.4E+02
Units				µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg
DG-AK3	0.5-1	DG-AK3S-0.5-1	12/19/2018	<0.60	**0.76**	**1.2**	<0.54	<0.39	<0.35	<3.1	<0.58	<0.45	<0.61	<0.32	<0.61	<0.45	<17	<17
DG-AK3	3.5-4	DG-AK3S-3.5-4	12/19/2018	<0.60	<0.42	<0.41	<0.54	<0.40	<0.36	<2.9	<0.58	<0.46	<0.62	<0.33	<0.62	<0.46	<17	<17
DG-AK7	0.5-1	DG-AK7S-0.5-1	1/9/2019	**19**	**18**	**32**	<0.55	<0.40	<0.36	<3.2	**22**	**30**	<0.63	<0.33	<0.63	<0.46	<84	**940**
DG-AK7	3.5-4	DG-AK7S-3.5-4	1/9/2019	<0.60	<0.41	<0.40	<0.54	<0.39	<0.36	<3.2	<0.58	<0.45	<0.62	<0.33	<0.62	<0.45	<17	<17
DG-AK7 (D)	3.5-4	DG-AK7 (D)S-3.5-4	1/9/2019	<0.61	<0.42	<0.41	<0.55	<0.40	<0.36	<3.2	<0.59	<0.46	<0.63	<0.33	<0.63	<0.46	<17	<17
DG-AL13	0.5-1	DG-AL13S-0.5-1	1/29/2019	<0.60	<0.41	<0.40	<0.54	<0.39	<0.35	<3.1	<0.58	<0.45	<0.62	<0.32	<0.62	<0.45	<17	<17
DG-AL13	3.5-4	DG-AL13S-3.5-4	1/29/2019	<0.60	<0.41	<0.40	<0.54	<0.39	<0.36	<3.2	<0.58	<0.45	<0.62	<0.33	<0.62	<0.45	<17	<17
DG-AL5	0.5-1	DG-AL5S-0.5-1	1/30/2019	<1.5	<1.5	<1.5	<1.5	<2.0	<1.5	<9.9	<1.5	<1.5	<1.5	<2.0	<1.5	<1.5	<17	**17**
DG-AL5	3.5-4	DG-AL5S-3.5-4	1/30/2019	<1.5	<1.5	<1.5	<1.5	<1.9	<1.5	<9.7	<1.5	<1.5	<1.5	<1.9	<1.5	<1.5	<17	<17
DG-AL5 (D)	3.5-4	DG-AL5 (D)S-3.5-4	1/30/2019	<1.5	<1.5	<1.5	<1.5	<2.0	<1.5	<9.9	<1.5	<1.5	<1.5	<2.0	<1.5	<1.5	<17	<17
DG-AL9	0.5-1	DG-AL9S-0.5-1	1/21/2019	**34**	**91**	**26**	<0.54	<0.40	<0.36	<2.9	<0.58	<0.45	<0.62	<0.33	<0.62	<0.45	<17	<17
DG-AL9	3.5-4	DG-AL9S-3.5-4	1/21/2019	<0.60	<0.41	<0.40	<0.54	<0.39	<0.36	<2.9	<0.58	<0.45	<0.62	<0.33	<0.62	<0.45	<17	<17
DG-AL9	7-7.5	DG-AL9S-7-7.5	1/21/2019	<0.60	<0.41	<0.40	<0.54	<0.39	<0.36	<2.9	<0.58	<0.45	<0.62	<0.33	<0.62	<0.45	<17	<17
DG-AL9 (D)	7-7.5	DG-AL9 (D)S-7-7.5	1/21/2019	<0.60	<0.41	<0.40	<0.54	<0.39	<0.35	<3.1	<0.58	<0.45	<0.62	<0.32	<0.62	<0.45	<17	<17
DG-AM11	0.5-1	DG-AM11S-0.5-1	1/22/2019	<0.58	<0.40	<0.39	<0.52	<0.38	<0.34	<3.1	<0.56	<0.44	<0.60	<0.31	<0.60	<0.44	<17	<17
DG-AM11	3.5-4	DG-AM11S-3.5-4	1/22/2019	<1.2	<0.83	<0.81	<1.1	<0.79	<0.71	<5.8	<1.2	<0.91	<1.2	<0.65	<1.2	<0.91	<17	<17
DG-AM15	0.5-1	DG-AM15S-0.5-1	1/23/2019	<1.5	<1.5	<1.5	<1.5	<2.0	<1.5	<9.8	<1.5	<1.5	<1.5	<2.0	<1.5	<1.5	<17	<17
DG-AM15	3.5-4	DG-AM15S-3.5-4	1/23/2019	**2.4**	**27**	**7.4**	<1.5	<2.0	<1.5	<10	**3.0**	<1.5	<1.5	<2.0	<1.5	<1.5	**170**	<17
DG-AM15	9.5-10	DG-AM15S-9.5-10	1/23/2019	<1.5	<1.5	<1.5	<1.5	<2.0	<1.5	<9.9	<1.5	<1.5	<1.5	<2.0	<1.5	<1.5	<17	<17
DG-AM15 (D)	9.5-10	DG-AM15 (D)S-9.5-10	1/23/2019	<1.5	<1.5	<1.5	<1.5	<2.0	<1.5	<9.9	<1.5	<1.5	<1.5	<2.0	<1.5	<1.5	<17	<17
DG-AM3	0.5-1	DG-AM3S-0.5-1	12/19/2018	<0.58	**3.1**	**12**	<0.52	<0.38	<0.34	<3.0	<0.56	<0.43	<0.59	<0.31	<0.59	<0.43	<17	**25**
DG-AM3	3.5-4	DG-AM3S-3.5-4	12/19/2018	<0.61	<0.42	<0.41	<0.55	<0.40	<0.36	<2.9	<0.59	<0.46	<0.63	<0.33	<0.63	<0.46	<17	<17
DG-AM7	0.5-1	DG-AM7S-0.5-1	1/9/2019	**7.0**	**6.1**	**23**	<0.54	**2.2**	<0.36	<3.2	**28**	<0.46	<0.62	<0.33	<0.62	**2.5**	<17	**430**
DG-AM7	3.5-4	DG-AM7S-3.5-4	1/9/2019	<0.61	<0.42	<0.41	<0.55	<0.40	<0.36	<3.2	<0.59	<0.46	<0.63	<0.33	<0.63	<0.46	<17	<17
DG-AM7	7.5-8	DG-AM7S-7.5-8	1/9/2019	<0.60	<0.41	<0.40	<0.54	<0.39	<0.35	<3.1	<0.58	<0.45	<0.62	<0.32	<0.62	<0.45	<17	<17
DG-AN13	0.5-1	DG-AN13S-0.5-1	1/31/2019	<1.5	**2.8**	<1.5	<1.5	<2.0	<1.5	<9.9	<1.5	<1.5	<1.5	<2.0	<1.5	<1.5	<17	<17
DG-AN13	3.5-4	DG-AN13S-3.5-4	1/31/2019	<1.5	<1.5	<1.5	<1.5	<2.0	<1.5	<9.9	<1.5	<1.5	<1.5	<2.0	<1.5	<1.5	<17	<17
DG-AN13	9.5-10	DG-AN13S-9.5-10	1/31/2019	<1.5	<1.5	<1.5	<1.5	<2.0	<1.5	<9.9	<1.5	<1.5	<1.5	<2.0	<1.5	<1.5	<17	<17
DG-AN5	0.5-1	DG-AN5S-0.5-1	12/20/2018	<0.61	**0.65**	<0.41	<0.55	<0.40	<0.36	<3.2	<0.59	<0.46	<0.63	<0.33	<0.63	<0.46	<17	**23**
DG-AN5	3.5-4	DG-AN5S-3.5-4	12/20/2018	<0.58	<0.40	<0.39	<0.53	<0.38	<0.34	<2.8	<0.56	<0.44	<0.60	<0.32	<0.60	<0.44	<17	<17
DG-AN9	0.5-1	DG-AN9S-0.5-1	1/21/2019	<0.60	**1.7**	<0.40	<0.54	<0.39	<0.35	<2.8	<0.58	<0.45	<0.62	<0.32	<0.62	<0.45	<17	<17
DG-AN9	3.5-4	DG-AN9S-3.5-4	1/21/2019	<0.59	<0.41	<0.40	<0.54	<0.39	<0.35	<3.1	<0.58	<0.45	<0.61	<0.32	<0.61	<0.45	<17	<17
DG-AN9	7-7.5	DG-AN9S-7-7.5	1/21/2019	<0.59	<0.41	<0.40	<0.53	<0.39	<0.35	<3.1	<0.57	<0.45	<0.61	<0.32	<0.61	<0.45	<17	<17
DG-AO11	0.5-1	DG-AO11S-0.5-1	1/22/2019	<1.2	<0.80	<0.78	<1.0	<0.76	<0.68	<5.5	<1.1	<0.87	<1.2	<0.63	<1.2	<0.87	<17	<17
DG-AO11	3.5-4	DG-AO11S-3.5-4	1/22/2019	<2.9	<2.0	<1.9	<2.6	<1.9	<1.7	<15	<2.8	<2.2	<3.0	<1.6	<3.0	<2.2	<17	<17

Table 4: Organochlorine Pesticides and Polychlorinated Biphenyls
Concentrations in Soil
UPC OU-2
Brisbane, California

Sample Location	Depth Range (ft bgs)	Sample Name	Collection Date	4,4'-DDD	4,4'-DDE	4,4'-DDT	alpha-BHC	alpha-Chlordane	beta-BHC	Chlordane	Dieldrin	Endrin	Endrin aldehyde	Endrin ketone	gamma-BHC (Lindane)	gamma-Chlordane	PCB-1254 (Aroclor 1254)	PCB-1260 (Aroclor 1260)
Direct Exposure Human Health Risk Level Residential Soil Exposure ESL [1]				2.7E+03	1.8E+03	1.9E+03	--	--	--	4.8E+02	3.7E+01	2.1E+04	--	--	5.50E+02	--	2.30E+02	
Leaching to Groundwater Levels Non-drinking Water ESL [2]				6.5E+04	2.9E+04	5.6E+03	--	--	--	2.3E+04	6.3E+00	7.6E+00	--	--	7.4E+00	--	3.3E+05	
EPA RSL for Resident Soil [3]				1.9E+03	2.0E+03	1.9E+03	8.6E+01	--	3.0E+02	1.7E+03	3.4E+01	1.9E+04	--	--	5.7E+02	--	2.4E+02	2.4E+02
Units				µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg
DG-AO3	0.5-1	DG-AO3S-0.5-1	12/19/2018	<0.58	<0.40	<0.39	<0.52	<0.38	<0.34	<3.0	<0.56	<0.43	<0.59	<0.31	<0.59	<0.43	<17	**24**
DG-AO3	3.5-4	DG-AO3S-3.5-4	12/19/2018	<0.61	<0.42	<0.41	<0.55	<0.40	<0.36	<3.2	<0.59	<0.46	<0.63	<0.33	<0.63	<0.46	<17	<17
DG-AO7	0.5-1	DG-AO7S-0.5-1	1/9/2019	**2.8**	**3.8**	**6.9**	<0.55	**2.1**	<0.36	**46**	<0.59	<0.46	<0.63	<0.33	<0.63	**2.4**	<17	**440**
DG-AO7	3.5-4	DG-AO7S-3.5-4	1/9/2019	<0.61	<0.42	<0.41	<0.55	<0.40	<0.36	<3.2	<0.59	<0.46	<0.63	<0.33	<0.63	<0.46	<17	<17
DG-AP13	0.5-1	DG-AP13S-0.5-1	1/23/2019	<1.5	<1.5	<1.5	<1.5	<1.9	<1.5	<9.7	<1.5	<1.5	<1.5	<1.9	<1.5	<1.5	<16	<16
DG-AP13 (D)	0.5-1	DG-AP13 (D)S-0.5-1	1/23/2019	<1.5	<1.5	<1.5	<1.5	<2.0	<1.5	<9.8	<1.5	<1.5	<1.5	<2.0	<1.5	<1.5	<17	<17
DG-AP13	3.5-4	DG-AP13S-3.5-4	1/23/2019	<1.5	<1.5	<1.5	<1.5	<2.0	<1.5	<10	<1.5	<1.5	<1.5	<2.0	<1.5	<1.5	<17	<17
DG-AP13	9.5-10	DG-AP13S-9.5-10	1/23/2019	<1.5	<1.5	<1.5	<1.5	<2.0	<1.5	<9.8	<1.5	<1.5	<1.5	<2.0	<1.5	<1.5	<17	<17
DG-AP5	0.5-1	DG-AP5S-0.5-1	12/20/2018	<0.59	<0.41	<0.40	<0.53	<0.39	<0.35	<3.1	<0.57	<0.45	<0.61	<0.32	<0.61	<0.45	<17	<17
DG-AP5	3.5-4	DG-AP5S-3.5-4	12/20/2018	<0.59	<0.41	<0.40	<0.53	<0.39	<0.35	<3.1	<0.57	<0.45	<0.61	<0.32	<0.61	<0.45	<17	<17
DG-AP9	0.5-1	DG-AP9S-0.5-1	1/21/2019	<0.60	<0.41	<0.40	<0.54	<0.39	<0.35	<3.2	<0.58	<0.45	<0.62	<0.33	<0.62	<0.45	<17	<17
DG-AP9	3.5-4	DG-AP9S-3.5-4	1/21/2019	<0.59	<0.41	<0.40	<0.54	<0.39	<0.35	<3.1	<0.58	<0.45	<0.61	<0.32	<0.61	<0.45	<17	<17
DG-AQ11	0.5-1	DG-AQ11S-0.5-1	1/30/2019	<1.5	<1.5	<1.5	<1.5	<2.0	<1.5	<9.9	<1.5	<1.5	<1.5	<2.0	<1.5	<1.5	<17	<17
DG-AQ11	3.5-4	DG-AQ11S-3.5-4	1/30/2019	<1.5	<1.5	<1.5	<1.5	<1.9	<1.5	<9.7	<1.5	<1.5	<1.5	<1.9	<1.5	<1.5	<17	<17
DG-AQ3	0.5-1	DG-AQ3S-0.5-1	12/19/2018	<0.60	<0.41	<0.40	<0.54	<0.39	<0.35	<3.1	<0.58	<0.45	<0.62	<0.32	<0.62	<0.45	<17	<17
DG-AQ3	3.5-4	DG-AQ3S-3.5-4	12/19/2018	<0.60	<0.41	<0.40	<0.54	<0.39	<0.35	<3.1	<0.58	<0.45	<0.62	<0.32	<0.62	<0.45	<17	<17
DG-AQ7	0.5-1	DG-AQ7S-0.5-1	1/30/2019	<1.5	<1.5	<1.5	<1.5	<1.9	<1.5	<9.7	<1.5	<1.5	<1.5	<1.9	<1.5	<1.5	<17	<17
DG-AQ7	3.5-4	DG-AQ7S-3.5-4	1/30/2019	<1.5	<1.5	<1.5	<1.5	<2.0	<1.5	<9.8	<1.5	<1.5	<1.5	<2.0	<1.5	<1.5	<17	<17
DG-AR13	0.5-1	DG-AR13S-0.5-1	1/23/2019	<1.5	<1.5	<1.5	<1.5	<2.0	<1.5	<9.8	<1.5	<1.5	<1.5	<2.0	<1.5	<1.5	<17	<17
DG-AR13	3.5-4	DG-AR13S-3.5-4	1/23/2019	<1.5	<1.5	<1.5	<1.5	<2.0	<1.5	<9.9	<1.5	<1.5	<1.5	<2.0	<1.5	<1.5	<17	<17
DG-AR13	9.5-10	DG-AR13S-9.5-10	1/23/2019	<1.5	<1.5	<1.5	<1.5	<2.0	<1.5	<9.9	<1.5	<1.5	<1.5	<2.0	<1.5	<1.5	<17	<17
DG-AR5	0.5-1	DG-AR5S-0.5-1	12/20/2018	<0.60	<0.41	<0.40	<0.54	<0.39	<0.35	<3.1	<0.58	<0.45	<0.62	<0.32	<0.62	<0.45	<17	<17
DG-AR5	3.5-4	DG-AR5S-3.5-4	12/20/2018	<0.59	<0.40	<0.39	<0.53	<0.39	<0.35	<3.1	<0.57	<0.44	<0.61	<0.32	<0.61	<0.44	<17	<17
DG-AR9	0.5-1	DG-AR9S-0.5-1	1/9/2019	**4.3**	**3.4**	**15**	<0.54	**2.4**	<0.36	**35**	**3.9**	<0.46	<0.62	<0.33	<0.62	**3.1**	<17	**68**
DG-AR9	3.5-4	DG-AR9S-3.5-4	1/9/2019	<0.59	<0.41	<0.40	<0.53	<0.39	<0.35	<3.1	<0.57	<0.45	<0.61	<0.32	<0.61	<0.45	<17	<17
DG-AR9 (D)	3.5-4	DG-AR9 (D)S-3.5-4	1/9/2019	<0.60	<0.41	<0.40	<0.54	<0.39	<0.35	<3.2	<0.58	<0.45	<0.62	<0.33	<0.62	<0.45	<17	<17
DG-AS11	0.5-1	DG-AS11S-0.5-1	1/31/2019	<1.5	**2.7**	**3.3**	<1.5	<2.0	<1.5	<9.8	<1.5	<1.5	<1.5	<2.0	<1.5	<1.5	**46**	**29**
DG-AS11	3.5-4	DG-AS11S-3.5-4	1/31/2019	<4.5	<4.5	<4.5	<4.5	<6.0	<4.5	<30	<4.5	<4.5	<4.5	<6.0	<4.5	<4.5	<17	**27**
DG-AS11	7.5-8	DG-AS11S-7.5-8	1/31/2019	<4.3	<4.3	<4.3	<4.3	<5.7	<4.3	<29	<4.3	<4.3	<4.3	<5.7	<4.3	<4.3	<17	<17
DG-AS3	0.5-1	DG-AS3S-0.5-1	12/20/2018	<0.60	<0.41	<0.40	<0.54	<0.39	<0.35	<2.9	<0.58	<0.45	<0.62	<0.32	<0.62	<0.45	<17	<17
DG-AS3 (D)	0.5-1	DG-AS3 (D)S-0.5-1	12/20/2018	<0.58	**2.6**	**2.5**	<0.53	<0.38	<0.34	<3.1	<0.56	<0.44	<0.60	<0.32	<0.60	<0.44	<17	<17
DG-AS3	3.5-4	DG-AS3S-3.5-4	12/20/2018	<0.60	<0.42	<0.41	<0.54	<0.40	<0.36	<3.2	<0.58	<0.45	<0.62	<0.33	<0.62	<0.45	<17	<17
DG-AS3	4.5-5	DG-AS3S-4.5-5	12/20/2018	<0.59	<0.40	<0.39	<0.53	<0.39	<0.35	<3.1	<0.57	<0.44	<0.61	<0.32	<0.61	<0.44	<17	<17
DG-AS7	0.5-1	DG-AS7S-0.5-1	1/9/2019	**2.9**	**2.3**	**16**	<0.54	<0.39	<0.35	<3.1	<0.58	<0.45	<0.62	<0.32	<0.62	<0.45	<17	**120**
DG-AS7	3.5-4	DG-AS7S-3.5-4	1/9/2019	<0.61	<0.42	<0.41	<0.55	<0.40	<0.36	<3.2	<0.59	<0.46	<0.63	<0.33	<0.63	<0.46	<17	<17

Table 4: Organochlorine Pesticides and Polychlorinated Biphenyls Concentrations in Soil

UPC OU-2

Brisbane, California

Sample Location	Depth Range (ft bgs)	Sample Name	Collection Date	4,4'-DDD	4,4'-DDE	4,4'-DDT	alpha-BHC	alpha-Chlordane	beta-BHC	Chlordane	Dieldrin	Endrin	Endrin aldehyde	Endrin ketone	gamma-BHC (Lindane)	gamma-Chlordane	PCB-1254 (Aroclor 1254)	PCB-1260 (Aroclor 1260)
Direct Exposure Human Health Risk Level Residential Soil Exposure ESL [1]				2.7E+03	1.8E+03	1.9E+03	--	--	--	4.8E+02	3.7E+01	2.1E+04	--	--	5.50E+02	--	2.30E+02	
Leaching to Groundwater Levels Non-drinking Water ESL [2]				6.5E+04	2.9E+04	5.6E+03	--	--	--	2.3E+04	6.3E+00	7.6E+00	--	--	7.4E+00	--	3.3E+05	
EPA RSL for Resident Soil [3]				1.9E+03	2.0E+03	1.9E+03	8.6E+01	--	3.0E+02	1.7E+03	3.4E+01	1.9E+04	--	--	5.7E+02	--	2.4E+02	2.4E+02
Units				µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg
DG-AT12	0.5-1	DG-AT12S-0.5-1	1/23/2019	<1.5	<1.5	<1.5	<1.5	<2.0	<1.5	<9.9	<1.5	<1.5	<1.5	<2.0	<1.5	<1.5	<17	<17
DG-AT12	3.5-4	DG-AT12S-3.5-4	1/23/2019	<1.5	<1.5	<1.5	<1.5	<1.9	<1.5	<9.7	<1.5	<1.5	**6.6**	<1.9	<1.5	<1.5	<17	<17
DG-AT12	9.5-10	DG-AT12S-9.5-10	1/23/2019	<1.5	<1.5	<1.5	<1.5	<1.9	<1.5	<9.7	<1.5	<1.5	<1.5	<1.9	<1.5	<1.5	<17	<17
DG-AT5	0.5-1	DG-AT5S-0.5-1	12/20/2018	<0.58	<0.40	<0.39	<0.52	<0.38	<0.34	<2.8	<0.56	<0.44	<0.60	<0.31	<0.60	<0.44	<17	<17
DG-AT5	3.5-4	DG-AT5S-3.5-4	12/20/2018	<0.60	<0.41	<0.40	<0.54	<0.39	<0.35	<2.8	<0.58	<0.45	<0.62	<0.32	<0.62	<0.45	<17	<17
DG-AT9	0.5-1	DG-AT9S-0.5-1	1/30/2019	**5.6**	**63**	**85**	<1.5	<1.9	<1.5	<9.7	**3.2**	<1.5	<1.5	<1.9	<1.5	**2.3**	<16	**52**
DG-AT9	3.5-4	DG-AT9S-3.5-4	1/30/2019	<1.5	**4.4**	**1.8**	<1.5	<2.0	<1.5	<9.9	<1.5	<1.5	<1.5	<2.0	<1.5	<1.5	<17	<17
DG-AU11	0.5-1	DG-AU11S-0.5-1	1/23/2019	<1.5	<1.5	<1.5	<1.5	<1.9	<1.5	<9.7	<1.5	<1.5	<1.5	<1.9	<1.5	<1.5	<17	<17
DG-AU11	3.5-4	DG-AU11S-3.5-4	1/23/2019	**1.5**	**15**	**39**	<1.5	<2.0	<1.5	<9.8	**11**	<1.5	<1.5	<2.0	<1.5	<1.5	**760**	**560**
DG-AU11	9.5-10	DG-AU11S-9.5-10	1/23/2019	<1.5	<1.5	<1.5	<1.5	<2.0	<1.5	<9.9	<1.5	<1.5	<1.5	<2.0	<1.5	<1.5	**22**	<17
DG-AU3	0.5-1	DG-AU3S-0.5-1	12/20/2018	**2.6**	**0.79**	<0.40	<0.54	<0.39	<0.35	<3.2	<0.58	<0.45	<0.62	<0.33	<0.62	<0.45	<17	**36**
DG-AU3	3.5-4	DG-AU3S-3.5-4	12/20/2018	<0.59	<0.41	<0.40	<0.54	<0.39	<0.35	<3.1	<0.57	<0.45	<0.61	<0.32	<0.61	<0.45	<17	<17
DG-AU7	0.5-1	DG-AU7S-0.5-1	1/9/2019	**3.9**	**2.3**	**13**	<0.54	**0.84**	<0.36	<3.2	<0.58	<0.46	<0.62	<0.33	<0.62	**1.0**	<17	**220**
DG-AU7 (D)	0.5-1	DG-AU7 (D)S-0.5-1	1/9/2019	**3.6**	**2.8**	<0.40	<0.54	**1.2**	<0.35	<3.1	<0.58	<0.45	<0.62	<0.32	<0.62	**1.0**	<17	<17
DG-AU7	3.5-4	DG-AU7S-3.5-4	1/9/2019	<0.60	<0.41	<0.40	<0.54	<0.39	**2.5**	<3.2	<0.58	<0.45	<0.62	<0.33	<0.62	<0.45	<17	<17
DG-AV5	0.5-1	DG-AV5S-0.5-1	12/20/2018	<0.60	**5.7**	**14**	<0.54	<0.39	<0.36	<2.9	<0.58	<0.45	<0.62	<0.33	<0.62	<0.45	<17	**420**
DG-AV5 (D)	0.5-1	DG-AV5 (D)S-0.5-1	12/20/2018	<0.58	**7.8**	**21**	<0.53	**12**	<0.34	**160**	<0.56	<0.44	<0.60	<0.32	<0.60	**12**	<17	**740**
DG-AV5	3.5-4	DG-AV5S-3.5-4	12/20/2018	<0.59	<0.41	<0.40	<0.54	<0.39	<0.35	<3.1	<0.57	<0.45	<0.61	<0.32	<0.61	<0.45	<17	<17
DG-AV5	7.5-8	DG-AV5S-7.5-8	12/20/2018	<0.59	<0.40	<0.39	<0.53	<0.38	<0.35	<3.1	<0.57	<0.44	<0.61	<0.32	<0.61	<0.44	<17	<17
DG-AV9	0.5-1	DG-AV9S-0.5-1	2/1/2019	**120**	**280**	**220**	<1.1	**61**	<0.71	**340**	**1.5**	<0.90	<1.2	<0.65	<1.2	**51**	<17	<17
DG-AV9	3.5-4	DG-AV9S-3.5-4	2/1/2019	**3.2**	**9.5**	**6.5**	<0.53	**1.8**	<0.35	**18**	**2.5**	<0.44	<0.60	<0.32	<0.60	**2.1**	<17	**24**
DG-AV9	8.5-9	DG-AV9S-8.5-9	2/1/2019	**1.9**	**1.6**	**5.7**	<0.53	<0.38	<0.34	<3.1	<0.56	<0.44	<0.60	<0.32	<0.60	<0.44	<17	<17
DG-AW11	0.5-1	DG-AW11S-0.5-1	1/23/2019	<1.5	<1.5	**14**	<1.5	<1.9	<1.5	<9.7	<1.5	<1.5	**1.9**	<1.9	<1.5	<1.5	<17	**230**
DG-AW11	3.5-4	DG-AW11S-3.5-4	1/23/2019	<1.5	**27**	**4.7**	<1.5	<1.9	<1.5	<9.7	**2.4**	<1.5	**1.7**	<1.9	<1.5	<1.5	<16	**66**
DG-AW11	7.5-8	DG-AW11S-7.5-8	1/23/2019	**4.0**	**11**	**5.4**	<1.5	<2.0	<1.5	<9.9	<1.5	<1.5	<1.5	<2.0	<1.5	<1.5	<17	<17
DG-AW3	0.5-1	DG-AW3S-0.5-1	1/31/2019	<1.5	<1.5	**1.5**	<1.5	<2.0	<1.5	<9.8	<1.5	<1.5	<1.5	<2.0	<1.5	<1.5	<17	**25**
DG-AW3	3.5-4	DG-AW3S-3.5-4	1/31/2019	<1.5	<1.5	<1.5	<1.5	<2.0	<1.5	<9.9	<1.5	<1.5	<1.5	<2.0	<1.5	<1.5	<17	<17
DG-AX5	0.5-1	DG-AX5S-0.5-1	12/20/2018	<0.61	<0.42	<0.41	<0.55	<0.40	<0.36	<2.9	<0.59	<0.46	<0.63	<0.33	<0.63	<0.46	<17	<17
DG-AX5	3.5-4	DG-AX5S-3.5-4	12/20/2018	<0.57	<0.40	<0.39	<0.52	<0.38	<0.34	<3.0	<0.56	<0.43	<0.59	<0.31	<0.59	<0.43	<17	<17
DG-AX9	0.5-1	DG-AX9S-0.5-1	1/23/2019	<1.5	<1.5	<1.5	<1.5	<2.0	<1.5	<9.8	<1.5	<1.5	<1.5	<2.0	<1.5	<1.5	<17	<17
DG-AX9	3.5-4	DG-AX9S-3.5-4	1/23/2019	<1.5	<1.5	<1.5	<1.5	<2.0	<1.5	<10	<1.5	<1.5	<1.5	<2.0	<1.5	<1.5	<17	<17
DG-AX9	9.5-10	DG-AX9S-9.5-10	1/23/2019	<1.5	<1.5	<1.5	<1.5	<2.0	<1.5	<9.8	<1.5	<1.5	<1.5	<2.0	<1.5	<1.5	<17	<17
DG-AY3	0.5-1	DG-AY3S-0.5-1	1/31/2019	<1.5	<1.5	<1.5	<1.5	<2.0	<1.5	<9.9	<1.5	<1.5	<1.5	<2.0	<1.5	<1.5	<17	<17
DG-AY3	3.5-4	DG-AY3S-3.5-4	1/31/2019	<1.5	<1.5	<1.5	<1.5	<2.0	<1.5	<9.8	<1.5	<1.5	<1.5	<2.0	<1.5	<1.5	<17	<17
DG-N1	0.5-1	DG-N1S-0.5-1	12/18/2018	<0.60	**2.7**	**10**	<0.54	**1.4**	<0.35	<2.8	<0.58	<0.45	<0.62	<0.32	<0.62	<0.45	<17	**50**

Table 4: Organochlorine Pesticides and Polychlorinated Biphenyls
Concentrations in Soil
UPC OU-2
Brisbane, California

Sample Location	Depth Range (ft bgs)	Sample Name	Collection Date	4,4'-DDD	4,4'-DDE	4,4'-DDT	alpha-BHC	alpha-Chlordane	beta-BHC	Chlordane	Dieldrin	Endrin	Endrin aldehyde	Endrin ketone	gamma-BHC (Lindane)	gamma-Chlordane	PCB-1254 (Aroclor 1254)	PCB-1260 (Aroclor 1260)
Direct Exposure Human Health Risk Level Residential Soil Exposure ESL [1]				2.7E+03	1.8E+03	1.9E+03	--	--	--	4.8E+02	3.7E+01	2.1E+04	--	--	5.50E+02	--	2.30E+02	
Leaching to Groundwater Levels Non-drinking Water ESL [2]				6.5E+04	2.9E+04	5.6E+03	--	--	--	2.3E+04	6.3E+00	7.6E+00	--	--	7.4E+00	--	3.3E+05	
EPA RSL for Resident Soil [3]				1.9E+03	2.0E+03	1.9E+03	8.6E+01	--	3.0E+02	1.7E+03	3.4E+01	1.9E+04	--	--	5.7E+02	--	2.4E+02	2.4E+02
Units				µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg
DG-N1	3.5-4	DG-N1S-3.5-4	12/18/2018	<0.61	<0.42	<0.41	<0.55	<0.40	<0.36	<2.9	<0.59	<0.46	<0.63	<0.33	<0.63	<0.46	<17	<17
DG-N13	0.5-1	DG-N13S-0.5-1	1/10/2019	<0.61	<0.42	**1.4**	<0.55	**0.68**	<0.36	<3.2	<0.59	<0.46	<0.63	<0.33	<0.63	<0.46	<17	<17
DG-N13 (D)	0.5-1	DG-N13 (D)S-0.5-1	1/10/2019	<0.58	<0.40	**0.44**	<0.52	<0.38	<0.34	<3.0	<0.56	<0.43	<0.59	<0.31	<0.59	<0.43	<17	<17
DG-N13	3.5-4	DG-N13S-3.5-4	1/10/2019	**1.6**	<0.41	<0.40	<0.53	<0.39	<0.35	<3.1	<0.57	<0.45	<0.61	<0.32	<0.61	<0.45	<17	<17
DG-N13	7.5-8	DG-N13S-7.5-8	1/10/2019	<0.61	<0.42	<0.41	<0.55	<0.40	<0.36	<3.2	<0.59	<0.46	<0.63	<0.33	<0.63	<0.46	<17	<17
DG-N5	0.5-1	DG-N5S-0.5-1	1/8/2019	<0.61	**0.83**	<0.41	<0.55	<0.40	<0.36	<3.2	<0.59	<0.46	<0.63	<0.33	<0.63	<0.46	<17	<17
DG-N5 (D)	0.5-1	DG-N5 (D)S-0.5-1	1/8/2019	<0.58	<0.40	<0.39	<0.52	<0.38	<0.34	<3.0	<0.56	<0.44	<0.60	<0.31	<0.60	<0.44	**200**	**160**
DG-N5	3.5-4	DG-N5S-3.5-4	1/8/2019	<0.59	<0.41	<0.40	<0.54	<0.39	<0.35	<2.8	<0.57	<0.45	<0.61	<0.32	<0.61	<0.45	<17	<17
DG-N9	0.5-1	DG-N9S-0.5-1	1/10/2019	<1.2	<0.80	<0.78	<1.0	<0.76	<0.68	<6.1	<1.1	<0.87	<1.2	<0.63	<1.2	<0.87	<17	<17
DG-N9	3.5-4	DG-N9S-3.5-4	1/10/2019	<0.58	<0.40	<0.39	<0.53	<0.38	<0.34	<3.1	<0.56	<0.44	<0.60	<0.32	<0.60	<0.44	<17	<17
DG-O11	0.5-1	DG-O11S-0.5-1	1/10/2019	<0.61	<0.42	<0.41	<0.55	<0.40	<0.36	<3.2	<0.59	<0.46	<0.63	<0.33	<0.63	<0.46	<17	<17
DG-O11	3.5-4	DG-O11S-3.5-4	1/10/2019	<0.60	**0.58**	<0.40	<0.54	<0.39	<0.35	<3.2	<0.58	<0.45	<0.62	<0.33	<0.62	<0.45	<17	<17
DG-O15	0.5-1	DG-O15S-0.5-1	1/10/2019	**0.62**	<0.40	<0.39	<0.52	<0.38	<0.34	<3.0	<0.56	<0.44	<0.60	<0.31	<0.60	<0.44	<17	<17
DG-O15	3.5-4	DG-O15S-3.5-4	1/10/2019	<0.59	<0.40	<0.39	<0.53	<0.39	<0.35	<3.1	<0.57	<0.44	<0.61	<0.32	<0.61	<0.44	<17	<17
DG-O15 (D)	3.5-4	DG-O15 (D)S-3.5-4	1/10/2019	<0.61	<0.42	<0.41	<0.55	<0.40	<0.36	<3.2	<0.59	<0.46	<0.63	<0.33	<0.63	<0.46	<17	<17
DG-O15	7.5-8	DG-O15S-7.5-8	1/10/2019	<0.61	<0.42	<0.41	<0.55	<0.40	<0.36	<3.2	<0.59	<0.46	<0.63	<0.33	<0.63	<0.46	<17	<17
DG-O3	0.5-1	DG-O3S-0.5-1	12/18/2018	<0.60	<0.42	<0.41	<0.54	<0.40	<0.36	<3.2	<0.58	<0.46	<0.62	<0.33	<0.62	<0.46	<17	<17
DG-O3	3.5-4	DG-O3S-3.5-4	12/18/2018	<0.58	<0.40	<0.39	<0.52	<0.38	<0.34	<3.0	<0.56	<0.44	<0.60	<0.31	<0.60	<0.44	<17	<17
DG-O7	0.5-1	DG-O7S-0.5-1	1/8/2019	<0.58	<0.40	**1.4**	<0.52	<0.38	<0.34	<3.0	<0.56	<0.44	<0.60	<0.31	<0.60	<0.44	<17	<17
DG-O7	3.5-4	DG-O7S-3.5-4	1/8/2019	<0.59	<0.41	<0.40	<0.53	<0.39	<0.35	<3.1	<0.57	<0.44	<0.61	<0.32	<0.61	<0.44	<17	<17
DG-P1	0.5-1	DG-P1S-0.5-1	11/21/2018	<0.58	<0.40	<0.39	<0.53	<0.38	<0.35	<3.1	<0.57	<0.44	<0.60	<0.32	<0.60	<0.44	<17	<17
DG-P1	3.5-4	DG-P1S-3.5-4	11/21/2018	<0.58	<0.40	<0.39	<0.52	<0.38	<0.34	<3.0	<0.56	<0.44	<0.60	<0.31	<0.60	<0.44	<17	<17
DG-P1 (D)	3.5-4	DG-P1 (D)S-3.5-4	11/21/2018	<0.59	<0.40	<0.39	<0.53	<0.39	<0.35	<3.1	<0.57	<0.44	<0.61	<0.32	<0.61	<0.44	<17	<17
DG-P13	0.5-1	DG-P13S-0.5-1	1/10/2019	<0.60	<0.41	**9.6**	<0.54	<0.39	<0.35	<3.1	<0.58	<0.45	<0.62	<0.32	<0.62	<0.45	<17	<17
DG-P13	3.5-4	DG-P13S-3.5-4	1/10/2019	<0.61	<0.42	<0.41	<0.55	<0.40	<0.36	<3.2	<0.59	<0.46	<0.63	<0.33	<0.63	<0.46	<17	<17
DG-P13 (D)	3.5-4	DG-P13 (D)S-3.5-4	1/10/2019	<0.58	<0.40	<0.39	<0.52	<0.38	<0.34	<3.0	<0.56	<0.43	<0.59	<0.31	<0.59	<0.43	<17	<17
DG-P5	0.5-1	DG-P5S-0.5-1	1/8/2019	<0.60	**0.88**	<0.40	<0.54	**1.0**	<0.35	<3.1	<0.58	<0.45	<0.62	<0.32	<0.62	<0.45	<17	**110**
DG-P5	3.5-4	DG-P5S-3.5-4	1/8/2019	<0.59	<0.41	<0.40	<0.54	<0.39	<0.35	<3.1	<0.57	<0.45	<0.61	<0.32	<0.61	<0.45	<17	<17
DG-P9	0.5-1	DG-P9S-0.5-1	11/21/2018	<0.59	<0.41	<0.40	<0.53	<0.39	<0.35	<3.1	<0.57	<0.45	<0.61	<0.32	<0.61	<0.45	<17	<17
DG-P9	3.5-4	DG-P9S-3.5-4	11/21/2018	<0.61	<0.42	<0.41	<0.55	<0.40	<0.36	<3.2	<0.59	<0.46	<0.63	<0.33	<0.63	<0.46	<17	<17
DG-Q11	0.5-1	DG-Q11S-0.5-1	1/10/2019	<1.2	<0.81	<0.79	<1.1	<0.77	<0.70	<6.2	<1.1	<0.89	<1.2	<0.64	<1.2	<0.89	<17	<17
DG-Q11 (D)	0.5-1	DG-Q11 (D)S-0.5-1	1/10/2019	<1.2	<0.83	<0.81	<1.1	<0.79	<0.71	<6.3	<1.2	<0.91	<1.2	<0.65	<1.2	<0.91	<17	<17
DG-Q11	3.5-4	DG-Q11S-3.5-4	1/10/2019	<2.9	<2.0	<1.9	<2.6	<1.9	<1.7	<15	<2.8	<2.2	<3.0	<1.6	<3.0	<2.2	<17	<17
DG-Q15	0.5-1	DG-Q15S-0.5-1	1/11/2019	<1.2	<0.83	<0.81	<1.1	<0.79	<0.72	<5.8	<1.2	<0.91	<1.3	<0.66	<1.3	<0.91	<17	<17
DG-Q15 (D)	0.5-1	DG-Q15 (D)S-0.5-1	1/11/2019	<1.2	<0.81	**6.0**	<1.1	<0.77	<0.69	<5.6	<1.1	<0.88	<1.2	<0.63	<1.2	<0.88	<17	<17

Table 4: Organochlorine Pesticides and Polychlorinated Biphenyls Concentrations in Soil

UPC OU-2

Brisbane, California

Sample Location	Depth Range (ft bgs)	Sample Name	Collection Date	4,4'-DDD	4,4'-DDE	4,4'-DDT	alpha-BHC	alpha-Chlordane	beta-BHC	Chlordane	Dieldrin	Endrin	Endrin aldehyde	Endrin ketone	gamma-BHC (Lindane)	gamma-Chlordane	PCB-1254 (Aroclor 1254)	PCB-1260 (Aroclor 1260)
Direct Exposure Human Health Risk Level Residential Soil Exposure ESL [1]				2.7E+03	1.8E+03	1.9E+03	--	--	--	4.8E+02	3.7E+01	2.1E+04	--	--	5.50E+02	--	2.30E+02	
Leaching to Groundwater Levels Non-drinking Water ESL [2]				6.5E+04	2.9E+04	5.6E+03	--	--	--	2.3E+04	6.3E+00	7.6E+00	--	--	7.4E+00	--	3.3E+05	
EPA RSL for Resident Soil [3]				1.9E+03	2.0E+03	1.9E+03	8.6E+01	--	3.0E+02	1.7E+03	3.4E+01	1.9E+04	--	--	5.7E+02	--	2.4E+02	2.4E+02
Units				µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg
DG-Q15	3.5-4	DG-Q15S-3.5-4	1/11/2019	<0.59	<0.40	<0.39	<0.53	<0.39	<0.35	<2.8	<0.57	<0.44	<0.61	<0.32	<0.61	<0.44	<16	<16
DG-Q15	7.5-8	DG-Q15S-7.5-8	1/11/2019	<2.9	<2.0	<2.0	<2.6	<1.9	<1.7	<15	<2.8	<2.2	<3.0	<1.6	<3.0	<2.2	<17	<17
DG-Q3	0.5-1	DG-Q3S-0.5-1	12/18/2018	<0.60	<0.41	<0.40	<0.54	<0.39	<0.35	<2.8	<0.58	<0.45	<0.62	<0.32	<0.62	<0.45	<17	<17
DG-Q3	3.5-4	DG-Q3S-3.5-4	12/18/2018	<0.59	<0.41	<0.40	<0.53	<0.39	<0.35	<3.1	<0.57	<0.45	<0.61	<0.32	<0.61	<0.45	<17	<17
DG-Q7	0.5-1	DG-Q7S-0.5-1	1/8/2019	<0.60	<0.41	<0.40	<0.54	<0.39	<0.35	<3.1	<0.58	<0.45	<0.62	<0.32	<0.62	<0.45	<17	<17
DG-Q7	3.5-4	DG-Q7S-3.5-4	1/8/2019	<0.58	<0.40	<0.39	<0.52	<0.38	<0.34	<3.0	<0.56	<0.44	<0.60	<0.31	<0.60	<0.44	<17	<17
DG-Q7 (D)	3.5-4	DG-Q7 (D)S-3.5-4	1/8/2019	<0.58	**5.1**	<0.39	<0.53	**1.6**	<0.34	<3.1	<0.56	<0.44	<0.60	<0.32	<0.60	<0.44	<17	**520**
DG-R1	0.5-1	DG-R1S-0.5-1	12/17/2018	<0.58	<0.40	<0.39	<0.53	**1.2**	<0.34	<3.1	<0.56	<0.44	<0.60	<0.32	<0.60	<0.44	<17	**53**
DG-R1	3.5-4	DG-R1S-3.5-4	12/17/2018	<0.59	<0.41	<0.40	<0.53	<0.39	<0.35	<2.8	<0.57	<0.45	<0.61	<0.32	<0.61	<0.45	<17	<17
DG-R13	0.5-1	DG-R13S-0.5-1	1/28/2019	<0.60	<0.41	<0.40	<0.54	<0.39	<0.35	<3.2	<0.58	<0.45	<0.62	<0.33	<0.62	<0.45	<17	<17
DG-R13	3.5-4	DG-R13S-3.5-4	1/28/2019	<0.60	<0.41	<0.40	<0.54	<0.39	<0.36	<3.2	<0.58	<0.45	<0.62	<0.33	<0.62	<0.45	<17	<17
DG-R5	0.5-1	DG-R5S-0.5-1	1/29/2019	**1.5**	**18**	**17**	<0.54	<0.39	<0.35	<3.1	<0.58	<0.45	<0.62	<0.32	<0.62	<0.45	<17	**89**
DG-R5	3.5-4	DG-R5S-3.5-4	1/29/2019	<0.60	<0.41	<0.40	<0.54	<0.39	<0.35	<3.1	<0.58	<0.45	<0.62	<0.32	<0.62	<0.45	<17	<17
DG-R5 (D)	3.5-4	DG-R5 (D)S-3.5-4	1/29/2019	<0.60	<0.41	<0.40	<0.54	<0.39	<0.35	<3.2	<0.58	<0.45	<0.62	<0.33	<0.62	<0.45	<17	<17
DG-R9	0.5-1	DG-R9S-0.5-1	1/22/2019	<0.58	<0.40	<0.39	<0.52	<0.38	<0.34	<2.8	<0.56	<0.44	<0.60	<0.31	<0.60	<0.44	<17	<17
DG-R9	3.5-4	DG-R9S-3.5-4	1/22/2019	<0.59	<0.41	<0.40	<0.53	<0.39	<0.35	<3.1	<0.57	<0.45	<0.61	<0.32	<0.61	<0.45	<17	<17
DG-S11	0.5-1	DG-S11S-0.5-1	1/10/2019	<2.9	<2.0	<1.9	<2.6	<1.9	<1.7	<15	<2.8	<2.2	<3.0	<1.6	<3.0	<2.2	<17	<17
DG-S11	3.5-4	DG-S11S-3.5-4	1/10/2019	<1.2	<0.84	<0.82	<1.1	<0.80	<0.72	<6.4	<1.2	<0.92	<1.3	<0.66	<1.3	<0.92	<17	<17
DG-S15	0.5-1	DG-S15S-0.5-1	1/11/2019	<1.2	<0.84	<0.82	<1.1	<0.80	<0.72	<6.4	<1.2	<0.92	<1.3	<0.66	<1.3	<0.92	<17	<17
DG-S15	3.5-4	DG-S15S-3.5-4	1/11/2019	<0.58	<0.40	<0.39	<0.52	<0.38	<0.34	<2.8	<0.56	<0.44	<0.60	<0.31	<0.60	<0.44	<17	<17
DG-S15 (D)	3.5-4	DG-S15 (D)S-3.5-4	1/11/2019	<0.59	<0.41	<0.40	<0.53	<0.39	<0.35	<2.8	<0.57	<0.45	<0.61	<0.32	<0.61	<0.45	<17	<17
DG-S3	0.5-1	DG-S3S-0.5-1	12/18/2018	<0.60	<0.41	<0.40	<0.54	<0.39	<0.35	<3.1	<0.58	<0.45	<0.62	<0.32	<0.62	<0.45	<17	<17
DG-S3	3.5-4	DG-S3S-3.5-4	12/18/2018	<1.2	<0.82	<0.80	<1.1	<0.78	<0.70	<6.2	<1.2	<0.90	<1.2	<0.64	<1.2	<0.90	<17	<17
DG-S7	0.5-1	DG-S7S-0.5-1	1/8/2019	<0.58	<0.40	<0.39	<0.53	<0.38	<0.34	<2.8	<0.56	<0.44	<0.60	<0.32	<0.60	<0.44	<17	**380**
DG-S7	3.5-4	DG-S7S-3.5-4	1/8/2019	<0.59	<0.41	<0.40	<0.54	<0.39	<0.35	<2.8	<0.57	<0.45	<0.61	<0.32	<0.61	<0.45	<170	**5300**
DG-T1	0.5-1	DG-T1S-0.5-1	12/17/2018	<0.60	<0.41	<0.40	<0.54	<0.39	<0.35	<2.8	<0.58	<0.45	<0.62	<0.32	<0.62	<0.45	<17	<17
DG-T1	3.5-4	DG-T1S-3.5-4	12/17/2018	<0.61	<0.42	<0.41	<0.55	<0.40	<0.36	<3.2	<0.59	<0.46	<0.63	<0.33	<0.63	<0.46	<17	<17
DG-T1 (D)	3.5-4	DG-T1 (D)S-3.5-4	12/17/2018	<0.61	<0.42	<0.41	<0.55	<0.40	<0.36	<2.9	<0.59	<0.46	<0.63	<0.33	<0.63	<0.46	<17	<17
DG-T13	0.5-1	DG-T13S-0.5-1	1/10/2019	<0.58	<0.40	<0.39	<0.52	<0.38	<0.34	<3.0	<0.56	<0.44	<0.60	<0.31	<0.60	<0.44	<17	<17
DG-T13 (D)	0.5-1	DG-T13 (D)S-0.5-1	1/10/2019	<1.2	<0.81	<0.79	<1.1	<0.78	<0.70	<6.2	<1.1	<0.89	<1.2	<0.64	<1.2	<0.89	<17	<17
DG-T13	3.5-4	DG-T13S-3.5-4	1/10/2019	<0.61	<0.42	<0.41	<0.55	<0.40	<0.36	<3.2	<0.59	<0.46	<0.63	<0.33	<0.63	<0.46	<17	<17
DG-T17	0.5-1	DG-T17S-0.5-1	1/28/2019	<1.2	**2.6**	<0.81	<1.1	<0.79	<0.71	<6.3	<1.2	<0.90	<1.2	<0.65	<1.2	<0.90	<17	**33**
DG-T17	3.5-4	DG-T17S-3.5-4	1/28/2019	<0.59	<0.40	<0.39	<0.53	<0.38	<0.35	<3.1	**0.94**	<0.44	<0.60	<0.32	<0.60	<0.44	<17	<17
DG-T17	7-7.5	DG-T17S-7-7.5	1/28/2019	<0.60	<0.41	<0.40	<0.54	<0.39	<0.36	<3.2	<0.58	<0.45	<0.62	<0.33	<0.62	<0.45	<17	<17
DG-T17 (D)	7-7.5	DG-T17 (D)S-7-7.5	1/28/2019	<6.0	<4.1	<4.0	<5.4	<3.9	<3.6	<32	<5.8	<4.5	<6.2	<3.3	<6.2	<4.5	<17	<17

Table 4: Organochlorine Pesticides and Polychlorinated Biphenyls
Concentrations in Soil
UPC OU-2
Brisbane, California

Sample Location	Depth Range (ft bgs)	Sample Name	Collection Date	4,4'-DDD	4,4'-DDE	4,4'-DDT	alpha-BHC	alpha-Chlordane	beta-BHC	Chlordane	Dieldrin	Endrin	Endrin aldehyde	Endrin ketone	gamma-BHC (Lindane)	gamma-Chlordane	PCB-1254 (Aroclor 1254)	PCB-1260 (Aroclor 1260)
Direct Exposure Human Health Risk Level Residential Soil Exposure ESL [1]				2.7E+03	1.8E+03	1.9E+03	--	--	--	4.8E+02	3.7E+01	2.1E+04	--	--	5.50E+02	--	2.30E+02	
Leaching to Groundwater Levels Non-drinking Water ESL [2]				6.5E+04	2.9E+04	5.6E+03	--	--	--	2.3E+04	6.3E+00	7.6E+00	--	--	7.4E+00	--	3.3E+05	
EPA RSL for Resident Soil [3]				1.9E+03	2.0E+03	1.9E+03	8.6E+01	--	3.0E+02	1.7E+03	3.4E+01	1.9E+04	--	--	5.7E+02	--	2.4E+02	2.4E+02
Units				µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg
DG-T5	0.5-1	DG-T5S-0.5-1	1/8/2019	<0.59	<0.41	<0.40	<0.53	<0.39	<0.35	<2.8	<0.57	<0.44	<0.61	<0.32	<0.61	<0.44	<17	<17
DG-T5	3.5-4	DG-T5S-3.5-4	1/8/2019	<0.60	<0.41	<0.40	<0.54	<0.39	<0.35	<2.8	<0.58	<0.45	<0.62	<0.32	<0.62	<0.45	<17	<17
DG-T9	0.5-1	DG-T9S-0.5-1	1/10/2019	**4.1**	**1.3**	**7.9**	<0.53	<0.38	<0.35	<3.1	<0.57	<0.44	<0.61	<0.32	<0.61	<0.44	<17	**17**
DG-T9	3.5-4	DG-T9S-3.5-4	1/10/2019	<0.59	<0.41	<0.40	<0.53	<0.39	<0.35	<3.1	<0.57	<0.45	<0.61	<0.32	<0.61	<0.45	<17	<17
DG-U11	0.5-1	DG-U11S-0.5-1	1/10/2019	<3.0	<2.1	<2.0	<2.7	<2.0	<1.8	<16	<2.9	<2.3	<3.1	<1.6	<3.1	<2.3	<17	<17
DG-U11	3.5-4	DG-U11S-3.5-4	1/10/2019	<0.61	<0.42	<0.41	<0.55	<0.40	<0.36	<3.2	<0.59	<0.46	<0.63	<0.33	<0.63	<0.46	<17	<17
DG-U15	3.5-4	DG-U15S-3.5-4	1/28/2019	<0.61	<0.42	<0.41	<0.55	<0.40	<0.36	<3.2	<0.59	<0.46	<0.63	<0.33	<0.63	<0.46	<17	<17
DG-U15	8.5-9	DG-U15S-8.5-9	1/28/2019	<6.0	<4.1	<4.0	<5.4	<3.9	<3.5	<31	<5.8	<4.5	<6.2	<3.2	<6.2	<4.5	<17	<17
DG-U17	0.5-1	DG-U17S-0.5-1	1/28/2019	<1.2	<0.83	<0.81	<1.1	<0.79	<0.71	<6.3	<1.2	<0.90	<1.2	<0.65	<1.2	<0.90	<17	**78**
DG-U3	0.5-1	DG-U3S-0.5-1	12/18/2018	<0.58	<0.40	**7.1**	<0.52	<0.38	<0.34	<3.0	<0.56	<0.44	<0.60	<0.31	<0.60	<0.44	<17	**33**
DG-U3	3.5-4	DG-U3S-3.5-4	12/18/2018	<0.60	<0.41	<0.40	<0.54	<0.39	<0.35	<2.8	<0.58	<0.45	<0.62	<0.32	<0.62	<0.45	<17	<17
DG-U7	0.5-1	DG-U7S-0.5-1	1/8/2019	<0.58	**0.8**	<0.39	<0.53	<0.38	<0.34	<2.8	<0.56	<0.44	<0.60	<0.32	<0.60	<0.44	<17	<17
DG-U7	3.5-4	DG-U7S-3.5-4	1/8/2019	<0.60	<0.41	<0.40	<0.54	<0.39	<0.35	<3.1	<0.58	<0.45	<0.62	<0.32	<0.62	<0.45	<17	**19**
DG-V1	0.5-1	DG-V1S-0.5-1	12/17/2018	<0.60	<0.41	<0.40	<0.54	<0.39	<0.36	<3.2	<0.58	<0.45	<0.62	<0.33	<0.62	<0.45	<17	<17
DG-V1	3.5-4	DG-V1S-3.5-4	12/17/2018	<0.58	<0.40	<0.39	<0.53	<0.38	<0.34	<2.8	<0.56	<0.44	<0.60	<0.32	<0.60	<0.44	<17	<17
DG-V13	0.5-1	DG-V13S-0.5-1	1/10/2019	<1.2	<0.81	<0.79	<1.1	<0.77	<0.69	<6.1	<1.1	<0.88	<1.2	<0.63	<1.2	<0.88	<17	<17
DG-V13	3.5-4	DG-V13S-3.5-4	1/10/2019	<0.59	<0.41	<0.40	<0.53	<0.39	<0.35	<3.1	<0.57	<0.44	<0.61	<0.32	<0.61	<0.44	<17	**21**
DG-V13	7.5-8	DG-V13S-7.5-8	1/10/2019	<0.58	<0.40	<0.39	<0.52	<0.38	<0.34	<3.0	<0.56	<0.43	<0.60	<0.31	<0.60	<0.43	<17	<17
DG-V17	0.5-1	DG-V17S-0.5-1	1/28/2019	<0.60	<0.42	<0.41	<0.55	<0.40	<0.36	<3.2	<0.58	<0.46	<0.62	<0.33	<0.62	<0.46	<17	<17
DG-V17	3.5-4	DG-V17S-3.5-4	1/28/2019	<0.61	<0.42	<0.41	<0.55	<0.40	<0.36	<3.2	<0.59	<0.46	<0.63	<0.33	<0.63	<0.46	<17	<17
DG-V17 (D)	3.5-4	DG-V17 (D)S-3.5-4	1/28/2019	<0.58	<0.40	<0.39	<0.52	<0.38	<0.34	<3.0	<0.56	<0.44	<0.60	<0.31	<0.60	<0.44	<17	<17
DG-V17	9.5-10	DG-V17S-9.5-10	1/28/2019	<6.0	<4.1	<4.0	<5.4	<3.9	<3.5	<31	<5.8	<4.5	<6.2	<3.2	<6.2	<4.5	<17	<17
DG-V5	0.5-1	DG-V5S-0.5-1	1/8/2019	<0.59	<0.41	<0.40	<0.53	<0.39	<0.35	<3.1	<0.57	<0.45	<0.61	<0.32	<0.61	<0.45	<17	<17
DG-V5	3.5-4	DG-V5S-3.5-4	1/8/2019	<0.59	<0.40	<0.39	<0.53	<0.38	<0.35	<3.1	<0.57	<0.44	<0.61	<0.32	<0.61	<0.44	<17	<17
DG-V5	7.5-8	DG-V5S-7.5-8	1/8/2019	<0.59	<0.40	<0.39	<0.53	<0.38	<0.35	<3.1	<0.57	<0.44	<0.60	<0.32	<0.60	<0.44	<17	<17
DG-V9	0.5-1	DG-V9S-0.5-1	1/10/2019	<0.60	<0.41	<0.40	<0.54	<0.39	<0.35	<3.1	<0.58	<0.45	<0.62	<0.32	<0.62	<0.45	<17	<17
DG-V9	3.5-4	DG-V9S-3.5-4	1/10/2019	<0.59	<0.41	<0.40	<0.53	<0.39	<0.35	<3.1	<0.57	<0.45	<0.61	<0.32	<0.61	<0.45	<17	<17
DG-V9	7.5-8	DG-V9S-7.5-8	1/10/2019	<0.60	<0.41	<0.40	<0.54	<0.39	<0.35	<3.1	<0.58	<0.45	<0.62	<0.32	<0.62	<0.45	<17	<17
DG-W11	0.5-1	DG-W11S-0.5-1	1/29/2019	<1.2	<0.82	<0.80	<1.1	<0.78	<0.70	<6.2	<1.2	<0.90	<1.2	<0.64	<1.2	<0.90	<17	<17
DG-W11	3.5-4	DG-W11S-3.5-4	1/29/2019	<0.60	<0.41	<0.40	<0.54	<0.39	<0.35	<3.1	<0.58	<0.45	<0.62	<0.32	<0.62	<0.45	<17	<17
DG-W11 (D)	3.5-4	DG-W11 (D)S-3.5-4	1/29/2019	<0.60	<0.41	<0.40	<0.54	<0.39	<0.36	<3.2	<0.58	<0.45	<0.62	<0.33	<0.62	<0.45	<17	<17
DG-W15	0.5-1	DG-W15S-0.5-1	1/28/2019	<6.0	<4.1	<4.0	<5.4	<3.9	<3.5	<31	<5.8	<4.5	<6.2	<3.2	<6.2	<4.5	<17	<17
DG-W15 (D)	0.5-1	DG-W15 (D)S-0.5-1	1/28/2019	<6.0	<4.1	<4.0	<5.4	<3.9	<3.5	<31	<5.8	<4.5	<6.2	<3.2	<6.2	<4.5	<17	<17
DG-W15	3.5-4	DG-W15S-3.5-4	1/28/2019	<1.2	<0.83	<0.81	<1.1	<0.79	<0.71	<6.3	<1.2	<0.91	<1.2	<0.65	<1.2	<0.91	<17	<17
DG-W3	0.5-1	DG-W3S-0.5-1	2/5/2019	<0.60	<0.41	<0.40	<0.54	<0.39	<0.35	<3.2	<0.58	<0.45	<0.62	<0.33	<0.62	<0.45	<17	<17

Table 4: Organochlorine Pesticides and Polychlorinated Biphenyls
Concentrations in Soil
UPC OU-2
Brisbane, California

Sample Location	Depth Range (ft bgs)	Sample Name	Collection Date	4,4'-DDD	4,4'-DDE	4,4'-DDT	alpha-BHC	alpha-Chlordane	beta-BHC	Chlordane	Dieldrin	Endrin	Endrin aldehyde	Endrin ketone	gamma-BHC (Lindane)	gamma-Chlordane	PCB-1254 (Aroclor 1254)	PCB-1260 (Aroclor 1260)
Direct Exposure Human Health Risk Level Residential Soil Exposure ESL [1]				2.7E+03	1.8E+03	1.9E+03	--	--	--	4.8E+02	3.7E+01	2.1E+04	--	--	5.50E+02	--	2.30E+02	
Leaching to Groundwater Levels Non-drinking Water ESL [2]				6.5E+04	2.9E+04	5.6E+03	--	--	--	2.3E+04	6.3E+00	7.6E+00	--	--	7.4E+00	--	3.3E+05	
EPA RSL for Resident Soil [3]				1.9E+03	2.0E+03	1.9E+03	8.6E+01	--	3.0E+02	1.7E+03	3.4E+01	1.9E+04	--	--	5.7E+02	--	2.4E+02	2.4E+02
Units				µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg
DG-W3	3.5-4	DG-W3S-3.5-4	2/5/2019	<0.61	<0.42	<0.41	<0.55	<0.40	<0.36	<3.2	<0.59	<0.46	<0.63	<0.33	<0.63	<0.46	<17	<17
DG-W7	0.5-1	DG-W7S-0.5-1	1/29/2019	<0.60	<0.42	<0.41	<0.54	<0.40	<0.36	<3.2	<0.58	<0.46	<0.62	<0.33	<0.62	<0.46	<17	**47**
DG-W7	3.5-4	DG-W7S-3.5-4	1/29/2019	<0.60	<0.41	<0.40	<0.54	<0.39	<0.35	<3.1	<0.58	<0.45	<0.62	<0.32	<0.62	<0.45	<17	<17
DG-X1	0.5-1	DG-X1S-0.5-1	12/17/2018	<0.58	<0.40	<0.39	<0.52	<0.38	<0.34	<3.0	<0.56	<0.44	<0.60	<0.31	<0.60	<0.44	<17	<17
DG-X1 (D)	0.5-1	DG-X1 (D)S-0.5-1	12/17/2018	<0.58	<0.40	<0.39	<0.52	<0.38	<0.34	<2.8	<0.56	<0.44	<0.60	<0.31	<0.60	<0.44	<17	<17
DG-X1	3.5-4	DG-X1S-3.5-4	12/17/2018	<0.59	<0.41	<0.40	<0.54	<0.39	<0.35	<2.8	<0.57	<0.45	<0.61	<0.32	<0.61	<0.45	<17	<17
DG-X13	0.5-1	DG-X13S-0.5-1	1/22/2019	<0.60	<0.41	<0.40	<0.54	<0.39	<0.35	<3.1	<0.58	<0.45	<0.62	<0.32	<0.62	<0.45	<17	**22**
DG-X13	3.5-4	DG-X13S-3.5-4	1/22/2019	<0.58	<0.40	<0.39	<0.53	<0.38	<0.35	<2.8	<0.57	<0.44	<0.60	<0.32	<0.60	<0.44	<17	<17
DG-X13 (D)	3.5-4	DG-X13 (D)S-3.5-4	1/22/2019	<0.61	<0.42	<0.41	<0.55	<0.40	<0.36	<2.9	<0.59	<0.46	<0.63	<0.33	<0.63	<0.46	<17	<17
DG-X17	0.5-1	DG-X17S-0.5-1	1/28/2019	<6.0	<4.1	<4.0	<5.4	<3.9	<3.5	<31	<5.8	<4.5	<6.2	<3.2	<6.2	<4.5	<17	<17
DG-X17	3.5-4	DG-X17S-3.5-4	1/28/2019	<1.2	<0.83	<0.81	<1.1	<0.79	<0.71	<6.3	<1.2	<0.91	<1.3	<0.65	<1.3	<0.91	<17	<17
DG-X5	0.5-1	DG-X5S-0.5-1	1/8/2019	<0.58	<0.40	<0.39	<0.52	<0.38	<0.34	<2.8	<0.56	<0.44	<0.60	<0.31	<0.60	<0.44	<17	**90**
DG-X5	3.5-4	DG-X5S-3.5-4	1/8/2019	<0.59	<0.41	<0.40	<0.53	<0.39	<0.35	<3.1	<0.57	<0.45	<0.61	<0.32	<0.61	<0.45	<17	<17
DG-X9	0.5-1	DG-X9S-0.5-1	1/10/2019	<0.59	<0.41	<0.40	<0.53	<0.39	<0.35	<3.1	<0.57	<0.44	<0.61	<0.32	<0.61	<0.44	<17	<17
DG-X9	3.5-4	DG-X9S-3.5-4	1/10/2019	<0.59	<0.41	<0.40	<0.54	<0.39	<0.35	<3.1	<0.58	<0.45	<0.61	<0.32	**20**	<0.45	<17	<17
DG-Y11	0.5-1	DG-Y11S-0.5-1	1/21/2019	<6.0	<4.1	<4.0	<5.4	<3.9	<3.5	<31	<5.8	<4.5	<6.2	<3.2	<6.2	<4.5	<17	<17
DG-Y11	3.5-4	DG-Y11S-3.5-4	1/21/2019	<0.60	<0.41	<0.40	<0.54	<0.39	<0.35	<2.8	<0.58	<0.45	<0.62	<0.32	<0.62	<0.45	<17	<17
DG-Y15	0.5-1	DG-Y15S-0.5-1	1/31/2019	<1.5	<1.5	<1.5	<1.5	<2.0	<1.5	<9.8	**2.4**	<1.5	<1.5	<2.0	<1.5	<1.5	<17	<17
DG-Y15	3.5-4	DG-Y15S-3.5-4	1/31/2019	<1.5	<1.5	<1.5	<1.5	<2.0	<1.5	<9.8	<1.5	<1.5	<1.5	<2.0	<1.5	<1.5	<17	<17
DG-Y15 (D)	3.5-4	DG-Y15 (D)S-3.5-4	1/31/2019	<1.5	<1.5	<1.5	<1.5	<2.0	<1.5	<9.9	<1.5	<1.5	<1.5	<2.0	<1.5	<1.5	<17	<17
DG-Y15	7.5-8	DG-Y15S-7.5-8	1/31/2019	<1.5	<1.5	<1.5	<1.5	<2.0	<1.5	<9.8	<1.5	<1.5	<1.5	<2.0	<1.5	<1.5	<17	<17
DG-Y19	0.5-1	DG-Y19S-0.5-1	1/28/2019	<6.0	<4.1	<4.0	<5.4	<3.9	<3.5	<31	<5.8	<4.5	<6.2	<3.2	<6.2	<4.5	<17	<17
DG-Y19	3.5-4	DG-Y19S-3.5-4	1/28/2019	<0.60	<0.41	<0.40	<0.54	<0.39	<0.35	<3.1	<0.58	<0.45	<0.62	<0.32	<0.62	<0.45	<17	<17
DG-Y19	7.5-8	DG-Y19S-7.5-8	1/28/2019	<0.60	<0.41	<0.40	<0.54	<0.39	<0.35	<3.1	<0.58	<0.45	<0.62	<0.32	<0.62	<0.45	<17	<17
DG-Y3	0.5-1	DG-Y3S-0.5-1	2/5/2019	**7.1**	**4.5**	**35**	<1.1	<0.78	<0.71	<6.3	**25**	<0.90	<1.2	<0.65	<1.2	<0.90	<17	**210**
DG-Y3	3.5-4	DG-Y3S-3.5-4	2/5/2019	<0.58	<0.40	<0.39	<0.52	<0.38	<0.34	<3.0	<0.56	<0.44	<0.60	<0.31	<0.60	<0.44	<17	<17
DG-Y7	0.5-1	DG-Y7S-0.5-1	1/9/2019	**1.0**	<0.41	<0.40	<0.54	<0.39	<0.35	<3.1	<0.58	<0.45	<0.61	<0.32	<0.61	<0.45	<17	**84**
DG-Y7	3.5-4	DG-Y7S-3.5-4	1/9/2019	<0.60	<0.42	<0.41	<0.54	<0.40	<0.36	<3.2	<0.58	<0.45	<0.62	<0.33	<0.62	<0.45	<16	<16
DG-Z13	0.5-1	DG-Z13S-0.5-1	1/28/2019	<0.60	**4.5**	<0.40	<0.54	<0.39	<0.35	<3.1	<0.58	<0.45	<0.62	<0.32	<0.62	<0.45	<17	<17
DG-Z13	3.5-4	DG-Z13S-3.5-4	1/28/2019	<0.60	**0.69**	<0.41	<0.54	<0.40	<0.36	<3.2	<0.58	<0.46	<0.62	<0.33	<0.62	<0.46	<17	<17
DG-Z17	0.5-1	DG-Z17S-0.5-1	1/28/2019	<1.2	<0.80	<0.78	<1.0	<0.76	<0.68	<6.1	<1.1	<0.87	<1.2	<0.63	<1.2	<0.87	<17	<17
DG-Z17 (D)	0.5-1	DG-Z17 (D)S-0.5-1	1/28/2019	<1.2	**3.3**	**0.88**	<1.0	<0.76	<0.68	<6.0	<1.1	<0.87	<1.2	**0.7**	<1.2	<0.87	<17	<17
DG-Z17	3.5-4	DG-Z17S-3.5-4	1/28/2019	<3.0	<2.0	<2.0	<2.7	<2.0	<1.8	<16	<2.9	<2.2	<3.1	<1.6	<3.1	<2.2	<17	<17
DG-Z17	7.5-8	DG-Z17S-7.5-8	1/28/2019	<0.60	<0.42	<0.41	<0.55	<0.40	<0.36	<3.2	<0.58	<0.46	<0.62	<0.33	<0.62	<0.46	<17	<17
DG-Z5	0.5-1	DG-Z5S-0.5-1	1/8/2019	<0.61	<0.42	<0.41	<0.55	<0.40	<0.36	<2.9	<0.59	<0.46	<0.63	<0.33	<0.63	<0.46	<17	<17

Table 4: Organochlorine Pesticides and Polychlorinated Biphenyls Concentrations in Soil

UPC OU-2

Brisbane, California

Sample Location	Depth Range (ft bgs)	Sample Name	Collection Date	4,4'-DDD	4,4'-DDE	4,4'-DDT	alpha-BHC	alpha-Chlordane	beta-BHC	Chlordane	Dieldrin	Endrin	Endrin aldehyde	Endrin ketone	gamma-BHC (Lindane)	gamma-Chlordane	PCB-1254 (Aroclor 1254)	PCB-1260 (Aroclor 1260)
Direct Exposure Human Health Risk Level Residential Soil Exposure ESL [1]				2.7E+03	1.8E+03	1.9E+03	--	--	--	4.8E+02	3.7E+01	2.1E+04	--	--	5.50E+02	--	2.30E+02	
Leaching to Groundwater Levels Non-drinking Water ESL [2]				6.5E+04	2.9E+04	5.6E+03	--	--	--	2.3E+04	6.3E+00	7.6E+00	--	--	7.4E+00	--	3.3E+05	
EPA RSL for Resident Soil [3]				1.9E+03	2.0E+03	1.9E+03	8.6E+01	--	3.0E+02	1.7E+03	3.4E+01	1.9E+04	--	--	5.7E+02	--	2.4E+02	2.4E+02
Units				µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg
DG-Z5	3.5-4	DG-Z5S-3.5-4	1/8/2019	<0.58	<0.40	<0.39	<0.53	<0.38	<0.34	<2.8	<0.56	<0.44	<0.60	<0.32	<0.60	<0.44	<17	<17
DG-Z9	0.5-1	DG-Z9S-0.5-1	1/9/2019	**1.4**	**1.2**	**3.3**	<0.53	<0.38	<0.35	<3.1	**1.0**	**2.8**	<0.60	<0.32	<0.60	<0.44	<17	**49**
DG-Z9 (D)	0.5-1	DG-Z9 (D)S-0.5-1	1/9/2019	<0.57	<0.39	**13**	<0.52	<0.38	<0.34	<3.0	<0.55	<0.43	<0.59	<0.31	<0.59	<0.43	<17	**23**
DG-Z9	3.5-4	DG-Z9S-3.5-4	1/9/2019	<0.57	<0.39	<0.39	<0.52	<0.38	<0.34	<3.0	<0.55	<0.43	<0.59	<0.31	**4.4**	<0.43	<17	<17

Notes:

1. San Francisco Bay RWQCB, 2019. Summary of Soil ESLs, Jan. 2019 (Rev. 1) - Direct Exposure Human Health Risk Levels (Table S-1) Res: Shallow Soil Exposure.
2. San Francisco Bay RWQCB, 2019. Summary of Soil ESLs, Jan. 2019 (Rev. 1) - Leaching to Groundwater Levels (Table S-3) Non-drinking Water.
3. EPA, 2018. Regional Screening Levels - Generic Tables (November 2018). Screening level for "Resident Soil."
4. The lower RWQCB ESL is used as comparison criteria when available. If RWQCB ESLs are not available, EPA RSLs was selected for use as comparison criteria.
5. Organochlorine pesticides were analyzed by USEPA Method 8081A.
6. PCBs were analyzed by USEPA Method 8082.
7. Only analytes with detections are included in this table.
8. Non-detect results are presented with "<" followed by the MDL.
9. Results in bold font indicate a detection above the MDL.
10. Gray shading indicates a detection above the comparison criteria.

Abbreviations and Symbols:

ft bgs - Feet below ground surface
"--" - Not Available
µg/kg - microgram per kilogram
"<" - Non-detect result
(D) - Duplicate sample
RSL - Regional Screening Level
PCB - Polychlorinated Biphenyl
MDL - Method Detection Limit
ESL - Environmental Screening Level
RWQCB - Regional Water Quality Control Board
USEPA - United States Environmental Protection Agency

DRAFT

Table 5: Volatile Organic Compounds and Total Petroleum Hydrocarbons as Gasoline Concentrations in Soil
UPC OU-2
Brisbane, California

Geosyntec Consultants

Sample Location	Depth Range (ft bgs)	Sample Name	Collection Date	1,1,1-Trichloroethane	1,1,2-Trichloro-1,2,2-trifluoroethane	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	2-Butanone	4-Isopropyltoluene	4-Methyl-2-pentanone	Benzene	Carbon disulfide	Chloroform	cis-1,2-Dichloroethene	Ethylbenzene	Isopropylbenzene	Methyl-tert-butyl ether (MTBE)	Naphthalene	n-Butylbenzene	n-Propylbenzene	sec-Butylbenzene	tert-Butylbenzene	Tetrachloroethene (PCE)	Toluene	Trichloroethene (TCE)	Xylenes, Total	TPH-Gasoline (C4-C12)
Direct Exposure Human Health Risk Level Residential Soil Exposure ESL [1]				1.7E+06	--	--	--	--	--	--	3.3E+02	--	3.2E+02	1.9E+04	5.9E+03	--	4.7E+04	3.8E+03	--	--	--	--	5.9E+02	1.1E+06	9.5E+02	5.8E+05	4.3E+05
Leaching to Groundwater Levels Non-drinking Water ESL [2]				7.0E+03	--	--	--	--	--	--	2.5E+01	--	2.3E+01	1.6E+03	4.3E+02	--	2.5E+03	1.2E+03	--	--	--	--	8.0E+01	1.0E+04	8.5E+01	1.0E+04	4.9E+03
EPA RSL for Resident Soil [3]				8.1E+06	6.7E+06	3.0E+05	2.7E+05	2.7E+07	--	3.3E+07	1.2E+03	7.7E+05	3.2E+02	1.6E+05	5.8E+03	1.9E+06	4.7E+04	3.8E+03	3.9E+06	3.8E+06	7.8E+06	7.8E+06	2.4E+04	4.9E+06	9.4E+02	5.8E+05	--
Units				µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	mg/kg
DG-AA11	0.5-1	DG-AA11S-0.5-1	1/29/2019	<0.37	<3.7	<0.74	<0.74	<3.7	<0.37	<1.9	<0.37	<0.74	<0.37	<0.37	<0.37	<0.37	<0.74	<0.74	<0.74	<0.37	<0.74	<0.74	<0.37	<0.37	<0.37	<0.96	<0.052
DG-AA11	3.5-4	DG-AA11S-3.5-4	1/29/2019	<210	<850	<210	<210	<2,100	<210	<850	<210	<530	<210	<210	<210	<210	<430	<430	<430	<210	<210	<430	<210	<210	<210	<430	**390**
DG-AA15	0.5-1	DG-AA15S-0.5-1	1/22/2019	<0.39	<3.9	<0.79	<0.79	<3.9	<0.39	<2.0	<0.39	<0.79	<0.39	<0.39	<0.39	<0.39	<0.79	<0.79	<0.79	<0.39	<0.79	<0.79	<0.39	<0.39	<0.39	<1.0	<0.055
DG-AA19	0.5-1	DG-AA19S-0.5-1	1/24/2019	<0.50	<5.0	<1.0	<1.0	<5.0	<0.50	<2.5	<0.50	<1.0	<0.50	<0.50	<0.50	<0.50	<1.0	<1.0	<1.0	<0.50	<1.0	<1.0	<0.50	<0.50	<0.50	<1.3	<0.070
DG-AA19	3.5-4	DG-AA19S-3.5-4	1/24/2019	<0.43	<4.3	<0.85	<0.85	<4.3	<0.43	<2.1	<0.43	<0.85	<0.43	<0.43	<0.43	<0.43	<0.85	<0.85	<0.85	<0.43	<0.85	<0.85	<0.43	<0.43	<0.43	<1.1	**0.69**
DG-AA19	8.5-9	DG-AA19S-8.5-9	1/24/2019	<0.38	<3.8	<0.76	<0.76	**8.0**	<0.38	<1.9	<0.38	<0.76	<0.38	<0.38	<0.38	<0.38	<0.76	<0.76	<0.76	<0.38	<0.76	<0.76	<0.38	<0.38	<0.38	<0.98	<0.053
DG-AA3	0.5-1	DG-AA3S-0.5-1	12/18/2018	<0.60	<6.0	<1.2	<1.2	**35**	<0.60	<3.0	<0.60	<1.2	<0.60	<0.60	<0.60	<0.60	<1.2	<1.2	<1.2	<0.60	<1.2	<1.2	<0.60	<0.60	<0.60	<1.6	<0.084
DG-AA3 (D)	0.5-1	DG-AA3 (D)S-0.5-1	12/18/2018	<0.42	<4.2	<0.83	<0.83	<4.2	<0.42	<2.1	<0.42	<0.83	<0.42	<0.42	<0.42	<0.42	<0.83	<0.83	<0.83	<0.42	<0.83	<0.83	<0.42	<0.42	<0.42	<1.1	<0.058
DG-AA3	3.5-4	DG-AA3S-3.5-4	12/18/2018	<0.35	<3.5	<0.71	<0.71	<3.5	<0.35	<1.8	<0.35	<0.71	<0.35	<0.35	<0.35	<0.35	<0.71	<0.71	<0.71	<0.35	<0.71	<0.71	<0.35	<0.35	<0.35	<0.92	<0.050
DG-AA3	7-7.5	DG-AA3S-7-7.5	12/18/2018	<0.46	<4.6	<0.92	<0.92	<4.6	<0.46	<2.3	<0.46	<0.92	<0.46	<0.46	<0.46	<0.46	<0.92	<0.92	<0.92	<0.46	<0.92	<0.92	<0.46	<0.46	<0.46	<1.2	<0.064
DG-AA7	0.5-1	DG-AA7S-0.5-1	1/9/2019	<0.36	<3.6	<0.72	<0.72	<3.6	<0.36	<1.8	<0.36	<0.72	<0.36	<0.36	<0.36	<0.36	<0.72	<0.72	<0.72	<0.36	<0.72	<0.72	<0.36	<0.36	<0.36	<0.94	<0.051
DG-AA7	3.5-4	DG-AA7S-3.5-4	1/9/2019	<0.37	<3.7	<0.74	<0.74	<3.7	<0.37	<1.9	<0.37	<0.74	<0.37	<0.37	<0.37	<0.37	<0.74	<0.74	<0.74	<0.37	<0.74	<0.74	<0.37	<0.37	<0.37	<0.96	<0.052
DG-AB13	0.5-1	DG-AB13S-0.5-1	1/22/2019	<0.34	<3.4	<0.69	<0.69	<3.4	<0.34	<1.7	<0.34	<0.69	<0.34	<0.34	<0.34	<0.34	<0.69	<0.69	<0.69	<0.34	<0.69	<0.69	<0.34	<0.34	<0.34	<0.90	<0.048
DG-AB13	3.5-4	DG-AB13S-3.5-4	1/22/2019	<0.41	<4.1	<0.81	<0.81	<4.1	<0.41	<2.0	<0.41	<0.81	<0.41	<0.41	<0.41	<0.41	<0.81	<0.81	<0.81	<0.41	<0.81	<0.81	<0.41	<0.41	<0.41	<1.1	<0.057
DG-AB13 (D)	3.5-4	DG-AB13 (D)S-3.5-4	1/22/2019	<0.47	<4.7	<0.94	<0.94	<4.7	<0.47	<2.4	<0.47	<0.94	<0.47	<0.47	<0.47	<0.47	<0.94	<0.94	<0.94	<0.47	<0.94	<0.94	<0.47	<0.47	<0.47	<1.2	<0.066
DG-AB13	13.5-14	DG-AB13S-13.5-14	1/22/2019	<600	<2,400	**8600**	**1800**	<6,000	**2100**	<2,400	<600	<1,500	<600	<600	**730**	**1200**	<1,200	**7400**	**3800**	**2100**	**1000**	<1,200	<600	<600	<600	**7600**	**2400**
DG-AB17	0.5-1	DG-AB17S-0.5-1	1/24/2019	<37	<150	**55**	**42**	<370	<37	**4000**	<37	<93	<37	<37	**240**	**49**	<75	<75	<75	<37	<37	<75	<37	<37	<37	**3100**	**11**
DG-AB17	3.5-4	DG-AB17S-3.5-4	1/24/2019	<0.59	<5.9	<1.2	<1.2	**16**	<0.59	<3.0	<0.59	<1.2	<0.59	<0.59	<0.59	<0.59	<1.2	<1.2	<1.2	<0.59	<1.2	<1.2	<0.59	<0.59	<0.59	<1.5	<0.083
DG-AB5	0.5-1	DG-AB5S-0.5-1	1/29/2019	<0.32	<3.2	<0.64	<0.64	<3.2	<0.32	<1.6	<0.32	<0.64	<0.32	<0.32	<0.32	<0.32	<0.64	<0.64	<0.64	<0.32	<0.64	<0.64	<0.32	<0.32	<0.32	<0.83	<0.045
DG-AB5 (D)	0.5-1	DG-AB5 (D)S-0.5-1	1/29/2019	<0.31	<3.1	<0.62	<0.62	<3.1	<0.31	<1.7	<0.31	<0.62	<0.31	<0.31	<0.31	<0.31	<0.62	<0.62	<0.62	<0.31	<0.62	<0.62	<0.31	**0.45**	<0.31	<0.81	<0.044
DG-AB5	3.5-4	DG-AB5S-3.5-4	1/29/2019	<0.38	<3.8	<0.77	<0.77	<3.8	<0.38	<1.8	<0.38	<0.77	<0.38	<0.38	<0.38	<0.38	<0.77	<0.77	<0.77	<0.38	<0.77	<0.77	<0.38	<0.38	<0.38	<1.0	<0.054
DG-AB9	0.5-1	DG-AB9S-0.5-1	1/30/2019	<0.48	<4.8	<0.95	<0.95	<4.8	<0.48	<2.4	<0.48	<0.95	<0.48	<0.48	<0.48	<0.48	<0.95	<0.95	<0.95	<0.48	<0.95	<0.95	<0.48	<0.48	<0.48	<1.2	<0.067
DG-AB9	3.5-4	DG-AB9S-3.5-4	1/30/2019	<0.43	<4.3	<0.85	<0.85	<4.3	<0.43	<2.1	<0.43	<0.85	<0.43	<0.43	<0.43	<0.43	<0.85	<0.85	<0.85	<0.43	<0.85	<0.85	<0.43	<0.43	<0.43	<1.1	<0.060
DG-AC11	0.5-1	DG-AC11S-0.5-1	1/29/2019	<190	<740	<190	<190	<1,900	<190	<740	<190	<460	<190	<190	<190	<190	<370	<370	<370	<190	<190	<370	<190	<190	<190	<370	**220**
DG-AC11	3.5-4	DG-AC11S-3.5-4	1/29/2019	<0.36	<3.6	<0.71	<0.71	**6.9**	<0.36	<1.8	<0.36	<0.71	<0.36	<0.36	<0.36	<0.36	<0.71	<0.71	<0.71	<0.36	<0.71	<0.71	<0.36	<0.36	<0.36	<0.92	**0.099**
DG-AC11	8.5-9	DG-AC11S-8.5-9	1/29/2019	<0.36	<3.6	<0.71	<0.71	<3.6	<0.36	<1.8	<0.36	**2.7**	<0.36	<0.36	<0.36	<0.36	<0.71	<0.71	<0.71	<0.36	<0.71	<0.71	<0.36	**0.6**	<0.36	<0.93	<0.050
DG-AC15	0.5-1	DG-AC15S-0.5-1	1/31/2019	<0.38	<3.8	<0.76	<0.76	<3.8	<0.38	<1.9	<0.38	<0.76	<0.38	<0.38	<0.38	<0.38	<0.76	<0.76	<0.76	<0.38	<0.76	<0.76	<0.38	<0.38	<0.38	<0.99	<0.053
DG-AC15 (D)	0.5-1	DG-AC15 (D)S-0.5-1	1/31/2019	<0.37	<3.7	<0.74	<0.74	<3.7	<0.37	<1.9	<0.37	<0.74	<0.37	<0.37	<0.37	<0.37	<0.74	<0.74	<0.74	<0.37	<0.74	<0.74	<0.37	<0.37	<0.37	<0.97	<0.052
DG-AC15	3.5-4	DG-AC15S-3.5-4	1/31/2019	<0.39	<3.9	<0.78	<0.78	<3.9	<0.39	<2.0	<0.39	<0.78	<0.39	<0.39	<0.39	<0.39	<0.78	<0.78	<0.78	<0.39	<0.78	<0.78	<0.39	<0.39	<0.39	<1.0	<0.055
DG-AC15	7.5-8	DG-AC15S-7.5-8	1/31/2019	<58	<230	**530**	**150**	<580	**180**	<230	<58	<150	<58	<58	**76**	**64**	<120	**1400**	**130**	**91**	**67**	<120	<58	<58	<58	**370**	**97**
DG-AC3	0.5-1	DG-AC3S-0.5-1	12/19/2018	<0.39	<3.9	<0.77	<0.77	<3.9	<0.39	<1.9	<0.39	<0.77	<0.39	<0.39	<0.39	<0.39	<0.77	<0.77	<0.77	<0.39	<0.77	<0.77	<0.39	<0.39	<0.39	<1.0	<0.054
DG-AC3	3.5-4	DG-AC3S-3.5-4	12/19/2018	<0.31	<3.1	<0.62	<0.62	<3.1	<0.31	<1.6	<0.31	<0.62	<0.31	<0.31	<0.31	<0.31	<0.62	<0.62	<0.62	<0.31	<0.62	<0.62	<0.31	<0.31	<0.31	<0.81	<0.044
DG-AC7	0.5-1	DG-AC7S-0.5-1	1/9/2019	<0.38	<3.8	<0.77	<0.77	<3.8	<0.38	<1.9	<0.38	<0.77	<0.38	<0.38	<0.38	<0.38	<0.77	<0.77	<0.77	<0.38	<0.77	<0.77	<0.38	<0.38	<0.38	<1.0	<0.054
DG-AC7 (D)	0.5-1	DG-AC7 (D)S-0.5-1	1/9/2019	<0.34	<3.4	<0.67	<0.67	<3.4	<0.34	<1.7	<0.34	<0.67	<0.34	<0.34	<0.34	<0.34	<0.67	<0.67	<0.67	<0.34	<0.67	<0.67	<0.34	<0.34	<0.34	<0.87	<0.047
DG-AC7	3.5-4	DG-AC7S-3.5-4	1/9/2019	<0.47	<4.7	<0.94	<0.94	<4.7	<0.47	<2.3	<0.47	<0.94	<0.47	<0.47	<0.47	<0.47	<0.94	<0.94	<0.94	<0.47	<0.94	<0.94	<0.47	<0.47	<0.47	<1.2	<0.066
DG-AC7	7.5-8	DG-AC7S-7.5-8	1/9/2019	<0.39	<3.9	<0.78	<0.78	<3.9	<0.39	<1.9	<0.39	<0.78	<0.39	<0.39	<0.39	<0.39	<0.78	<0.78	<0.78	<0.39	<0.78	<0.78	<0.39	<0.39	<0.39	<1.0	<0.054
DG-AD13	0.5-1	DG-AD13S-0.5-1	2/1/2019	<0.40	<4.0	<0.80	<0.80	<4.0	<0.40	<2.0	<0.40	<0.80	<0.40	<0.40	<0.40	<0.40	<0.80	<0.80	<0.80	<0.40	<0.80	<0.80	<0.40	<0.40	<0.40	<1.0	<0.056
DG-AD13	3.5-4	DG-AD13S-3.5-4	2/1/2019	<0.40	<4.0	<0.79	<0.79	<4.0	<0.40	<2.0	**0.45**	**1.2**	<0.40	<0.40	<0.40	<0.40	<0.79	<0.79	<0.79	<0.40	<0.79	<0.79	<0.40	<0.40	<0.40	<1.0	<0.055
DG-AD13	7.5-8	DG-AD13S-7.5-8	2/1/2019	<200	<810	**1800**	**480**	<2,000	**400**	<810	<200	<500	<200	<200	**590**	**200**	<400	**4100**	**460**	**310**	**210**	<400	<200	**520**	<200	**1700**	**370**
DG-AD13 (D)	7.5-8	DG-AD13 (D)S-7.5-8	2/1/2019	<160	<620	**1000**	**290**	<1,600	**230**	<620	<160	<390	<160	<160	**290**	<160	<310	**2100**	<310	**200**	<160	<310	<160	**240**	<160	**940**	**250**
DG-AD17	0.5-1	DG-AD17S-0.5-1	1/24/2019	<0.42	<4.2	<0.84	<0.84	<4.2	<0.42	<2.1	<0.42	<0.84	<0.42	<0.42	<0.42	<0.42	<0.84	<0.84	<0.84	<0.42	<0.84	<0.84	<0.42	<0.42	<0.42	<1.1	<0.059
DG-AD17	3.5-4	DG-AD17S-3.5-4	1/24/2019	<76	<310	<76	<76	<760	<76	<310	<76	<190	<76	<76	<76	<76	<150	<150	<150	<76	<76	<150	<76	<76	<76	<150	**130**
DG-AD17	7-7.5	DG-AD17S-7-7.5	1/24/2019	<0.37	<3.7	<0.75	<0.75	<3.7	<0.37	<1.9	<0.37	<0.75	<0.37	<0.37	<0.37	<0.37	<0.75	**3.3**	<0.75	<0.37	<0.75	<0.75	<0.37	<0.37	<0.37	<0.97	**0.079**
DG-AD5	0.5-1	DG-AD5S-0.5-1	1/8/2019	<0.35	<3.5	<0.71	<0.71	<3.5	<0.35	<1.8	<0.35	<0.71	<0.35	<0.35	<0.35	<0.35	<0.71	<0.71	<0.71	<0.35	<0.71	<0.71	<0.35	<0.35	<0.35	<0.92	<0.050
DG-AD5	3.5-4	DG-AD5S-3.5-4	1/8/2019	<0.40	<4.0	<0.80	<0.80	**10**	<0.40	<2.0	<0.40	<0.80	<0.40	<0.40	<0.40	<0.40	<0.80	<0.80	<0.80	<0.40	<0.80	<0.80	<0.40	<0.40	<0.40	<1.0	<0.056
DG-AD9	0.5-1	DG-AD9S-0.5-1	1/9/2019	<0.31	<3.1	<0.63	<0.63	<3.1	<0.31	<1.6	<0.31	<0.63	<0.31	<0.31	<0.31	<0.31	<0.63	<0.63	<0.63	<0.31	<0.63	<0.63	<0.31	<0.31	<0.31	<0.82	<0.044

Table 5: Volatile Organic Compounds and Total Petroleum Hydrocarbons as Gasoline Concentrations in Soil
UPC OU-2
Brisbane, California

Sample Location	Depth Range (ft bgs)	Sample Name	Collection Date	1,1,1-Trichloroethane	1,1,2-Trichloro-1,2,2-trifluoroethane	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	2-Butanone	4-Isopropyltoluene	4-Methyl-2-pentanone	Benzene	Carbon disulfide	Chloroform	cis-1,2-Dichloroethene	Ethylbenzene	Isopropylbenzene	Methyl-tert-butyl ether (MTBE)	Naphthalene	n-Butylbenzene	n-Propylbenzene	sec-Butylbenzene	tert-Butylbenzene	Tetrachloroethene (PCE)	Toluene	Trichloroethene (TCE)	Xylenes, Total	TPH-Gasoline (C4-C12)
Direct Exposure Human Health Risk Level Residential Soil Exposure ESL [1]				1.7E+06	--	--	--	--	--	--	3.3E+02	--	3.2E+02	1.9E+04	5.9E+03	--	4.7E+04	3.8E+03	--	--	--	--	5.9E+02	1.1E+06	9.5E+02	5.8E+05	4.3E+05
Leaching to Groundwater Levels Non-drinking Water ESL [2]				7.0E+03	--	--	--	--	--	--	2.5E+01	--	2.3E+01	1.6E+03	4.3E+02	--	2.5E+03	1.2E+03	--	--	--	--	8.0E+01	1.0E+04	8.5E+01	1.0E+04	4.9E+03
EPA RSL for Resident Soil [3]				8.1E+06	6.7E+06	3.0E+05	2.7E+05	2.7E+07	--	3.3E+07	1.2E+03	7.7E+05	3.2E+02	1.6E+05	5.8E+03	1.9E+06	4.7E+04	3.8E+03	3.9E+06	3.8E+06	7.8E+06	7.8E+06	2.4E+04	4.9E+06	9.4E+02	5.8E+05	--
Units				µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	mg/kg
DG-AD9	3.5-4	DG-AD9S-3.5-4	1/9/2019	<0.33	<3.3	<0.67	<0.67	<3.3	<0.33	<1.7	<0.33	<0.67	<0.33	<0.33	<0.33	<0.33	<0.67	<0.67	<0.67	<0.33	<0.67	<0.67	<0.33	<0.33	<0.33	<0.87	<0.047
DG-AE11	0.5-1	DG-AE11S-0.5-1	1/21/2019	<0.36	<3.6	<0.73	<0.73	<3.6	<0.36	<1.8	<0.36	<0.73	<0.36	<0.36	<0.36	<0.36	<0.73	<0.73	<0.73	<0.36	<0.73	<0.73	<0.36	<0.36	<0.36	<0.95	**0.46**
DG-AE11	3.5-4	DG-AE11S-3.5-4	1/21/2019	<0.40	<4.0	<0.80	<0.80	<4.0	<0.40	<2.0	<0.40	<0.80	<0.40	<0.40	<0.40	<0.40	<0.80	<0.80	<0.80	<0.40	<0.80	<0.80	<0.40	<0.40	<0.40	<1.0	**0.15**
DG-AE3	0.5-1	DG-AE3S-0.5-1	12/19/2018	<0.45	<4.5	<0.90	<0.90	<4.5	<0.45	<2.2	<0.45	**1.1**	<0.45	<0.45	<0.45	<0.45	<0.90	<0.90	<0.90	<0.45	<0.90	<0.90	<0.45	<0.45	<0.45	<1.2	<0.063
DG-AE3	3.5-4	DG-AE3S-3.5-4	12/19/2018	<0.34	<3.4	<0.68	<0.68	<3.4	<0.34	<1.7	<0.34	<0.68	<0.34	<0.34	<0.34	<0.34	<0.68	<0.68	<0.68	<0.34	<0.68	<0.68	<0.34	<0.34	<0.34	<0.89	<0.048
DG-AE7	0.5-1	DG-AE7S-0.5-1	1/9/2019	<0.33	<3.3	<0.66	<0.66	<3.3	<0.33	<1.6	<0.33	<0.66	<0.33	<0.33	<0.33	<0.33	<0.66	<0.66	<0.66	<0.33	<0.66	<0.66	<0.33	<0.33	<0.33	<0.86	<0.046
DG-AE7	3.5-4	DG-AE7S-3.5-4	1/9/2019	<0.37	<3.7	<0.74	<0.74	**18**	<0.37	<1.8	<0.37	<0.74	<0.37	<0.37	<0.37	<0.37	<0.74	<0.74	<0.74	<0.37	<0.74	<0.74	<0.37	<0.37	<0.37	<0.96	<0.052
DG-AE7	8-8.5	DG-AE7S-8-8.5	1/9/2019	<0.38	<3.8	<0.76	<0.76	<3.8	<0.38	<1.9	<0.38	<0.76	<0.38	<0.38	<0.38	<0.38	<0.76	<0.76	<0.76	<0.38	<0.76	<0.76	<0.38	<0.38	<0.38	<0.99	<0.054
DG-AF13	0.5-1	DG-AF13S-0.5-1	1/28/2019	<0.43	<4.3	<0.85	<0.85	<4.3	<0.43	<2.1	<0.43	<0.85	<0.43	<0.43	<0.43	<0.43	<0.85	<0.85	<0.85	<0.43	<0.85	<0.85	<0.43	<0.43	<0.43	<1.1	<0.060
DG-AF13	3.5-4	DG-AF13S-3.5-4	1/28/2019	<0.33	<3.3	<0.66	<0.66	<3.3	<0.33	<1.7	<0.33	<0.66	<0.33	<0.33	<0.33	<0.33	<0.66	<0.66	<0.66	<0.33	<0.66	<0.66	<0.33	<0.33	<0.33	<0.86	<0.047
DG-AF5	0.5-1	DG-AF5S-0.5-1	1/8/2019	<0.36	<3.6	<0.73	<0.73	<3.6	<0.36	<1.8	<0.36	<0.73	<0.36	<0.36	<0.36	<0.36	<0.73	<0.73	<0.73	<0.36	<0.73	<0.73	<0.36	<0.36	<0.36	<0.95	<0.051
DG-AF5	3.5-4	DG-AF5S-3.5-4	1/8/2019	<0.49	<4.9	<0.98	<0.98	<4.9	<0.49	<2.5	<0.49	<0.98	<0.49	<0.49	<0.49	<0.49	<0.98	<0.98	<0.98	<0.49	<0.98	<0.98	<0.49	<0.49	<0.49	<1.3	<0.069
DG-AG11	0.5-1	DG-AG11S-0.5-1	1/21/2019	<0.38	<3.8	<0.76	<0.76	<3.8	<0.38	<1.9	<0.38	<0.76	<0.38	<0.38	<0.38	<0.38	<0.76	<0.76	<0.76	<0.38	<0.76	<0.76	<0.38	<0.38	<0.38	<0.99	<0.053
DG-AG11	3.5-4	DG-AG11S-3.5-4	1/21/2019	<0.36	<3.6	<0.72	<0.72	**7.8**	<0.36	<1.8	<0.36	<0.72	<0.36	<0.36	<0.36	<0.36	<0.72	<0.72	<0.72	<0.36	<0.72	<0.72	<0.36	<0.36	<0.36	<0.94	<0.051
DG-AG11	9.5-10	DG-AG11S-9.5-10	1/21/2019	<78	<310	<78	<78	<780	<78	<310	<78	<200	<78	<78	<78	**99**	<160	<160	**160**	**120**	**110**	<160	<78	<78	<78	<160	**160**
DG-AG15	0.5-1	DG-AG15S-0.5-1	1/24/2019	<0.36	<3.6	<0.73	<0.73	<3.6	**0.46**	<1.8	<0.36	<0.73	<0.36	<0.36	<0.36	<0.36	<0.73	<0.73	<0.73	<0.36	<0.73	<0.73	<0.36	<0.36	<0.36	<0.94	<0.051
DG-AG15	3.5-4	DG-AG15S-3.5-4	1/24/2019	<0.32	<3.2	<0.64	<0.64	**4.2**	<0.32	<1.6	<0.32	<0.64	<0.32	<0.32	<0.32	<0.32	<0.64	<0.64	<0.64	<0.32	<0.64	<0.64	<0.32	<0.32	<0.32	<0.83	<0.045
DG-AG15	8.5-9	DG-AG15S-8.5-9	1/24/2019	<0.43	<4.3	**2.9**	**1**	**27**	**0.44**	<2.1	**15**	**3.7**	<0.43	<0.43	**2.1**	**3.4**	<0.86	**0.87**	**2.4**	**12**	<0.86	<0.86	<0.43	**1.1**	<0.43	**3.6**	**0.23**
DG-AG3	0.5-1	DG-AG3S-0.5-1	12/19/2018	<0.48	<4.8	<0.97	<0.97	<4.8	<0.48	<2.4	<0.48	<0.97	<0.48	<0.48	<0.48	<0.48	<0.97	<0.97	<0.97	<0.48	<0.97	<0.97	<0.48	<0.48	<0.48	<1.3	<0.068
DG-AG3	3.5-4	DG-AG3S-3.5-4	12/19/2018	<0.37	<3.7	<0.74	<0.74	<3.7	<0.37	<1.8	<0.37	<0.74	<0.37	<0.37	<0.37	<0.37	<0.74	<0.74	<0.74	<0.37	<0.74	<0.74	<0.37	<0.37	<0.37	<0.96	<0.052
DG-AG3	3.5-4	DG-AG3S-3.5-4	2/4/2019	<0.32	<3.2	<0.64	<0.64	<3.2	<0.32	<1.6	<0.32	<0.64	<0.32	<0.32	<0.32	<0.32	<0.64	<0.64	<0.64	<0.32	<0.64	<0.64	<0.32	<0.32	<0.32	<0.84	<0.045
DG-AG7	0.5-1	DG-AG7S-0.5-1	1/30/2019	<0.34	<3.4	<0.69	<0.69	<3.4	<0.34	<1.7	<0.34	<0.69	<0.34	<0.34	<0.34	<0.34	<0.69	<0.69	<0.69	<0.34	<0.69	<0.69	<0.34	<0.34	<0.34	<0.89	<0.048
DG-AG7	3.5-4	DG-AG7S-3.5-4	1/30/2019	<0.97	<9.7	<1.9	<1.9	<9.7	<0.97	<4.9	<0.97	<1.9	<0.97	<0.97	<0.97	<0.97	<1.9	<1.9	<1.9	<0.97	<1.9	<1.9	<0.97	**1.3**	<0.97	<2.5	<0.14
DG-AH13	0.5-1	DG-AH13S-0.5-1	1/29/2019	<0.33	<3.3	<0.67	<0.67	<3.3	<0.33	<1.7	<0.33	<0.67	<0.33	<0.33	<0.33	<0.33	<0.67	<0.67	<0.67	<0.33	<0.67	<0.67	<0.33	<0.33	<0.33	<0.87	<0.047
DG-AH13	3.5-4	DG-AH13S-3.5-4	1/29/2019	<0.42	<4.2	<0.84	<0.84	<4.2	<0.42	<2.1	<0.42	<0.84	<0.42	<0.42	<0.42	<0.42	<0.84	<0.84	<0.84	<0.42	<0.84	<0.84	<0.42	<0.42	<0.42	<1.1	<0.059
DG-AH13	7.5-8	DG-AH13S-7.5-8	1/29/2019	<47	<190	<47	<47	<470	<47	<190	**82**	**210**	<47	<47	**59**	**330**	<93	**130**	**370**	**490**	**300**	<93	<47	<47	<47	<93	**120**
DG-AH17	0.5-1	DG-AH17S-0.5-1	1/24/2019	<0.33	<3.3	<0.67	<0.67	<3.3	**130**	<1.7	<0.33	<0.67	<0.33	<0.33	<0.33	<0.33	<0.67	<0.67	<0.67	<0.33	<0.67	<0.67	<0.33	**0.33**	<0.33	<0.87	**0.43**
DG-AH4	4-4.5	DG-AH4S-4-4.5	12/18/2018	<48	<190	**1100**	**320**	<480	**500**	<190	<48	<120	<48	<48	**75**	**2300**	<96	**570**	**680**	**340**	**650**	**1100**	<48	<48	<48	**340**	**250**
DG-AH5	0.5-1	DG-AH5S-0.5-1	1/8/2019	<0.34	<3.4	<0.67	<0.67	<3.4	<0.34	<1.7	<0.34	<0.67	<0.34	<0.34	<0.34	<0.34	<0.67	<0.67	<0.67	<0.34	<0.67	<0.67	<0.34	<0.34	<0.34	<0.87	<0.047
DG-AH5	3.5-4	DG-AH5S-3.5-4	1/8/2019	<0.32	<3.2	<0.63	<0.63	<3.2	<0.32	<1.6	<0.32	<0.63	<0.32	<0.32	<0.32	<0.32	<0.63	<0.63	<0.63	<0.32	<0.63	<0.63	<0.32	<0.32	<0.32	<0.82	<0.044
DG-AH5	8-8.5	DG-AH5S-8-8.5	1/8/2019	<0.36	<3.6	<0.71	<0.71	<3.6	<0.36	<1.8	<0.36	<0.71	<0.36	<0.36	<0.36	<0.36	<0.71	<0.71	<0.71	<0.36	<0.71	<0.71	<0.36	<0.36	<0.36	<0.93	<0.050
DG-AH9	0.5-1	DG-AH9S-0.5-1	1/30/2019	<0.40	<4.0	<0.79	<0.79	<4.0	<0.40	<2.0	<0.40	<0.79	<0.40	<0.40	<0.40	<0.40	<0.79	<0.79	<0.79	<0.40	<0.79	<0.79	<0.40	<0.40	<0.40	<1.0	<0.055
DG-AH9	3.5-4	DG-AH9S-3.5-4	1/30/2019	<0.41	<4.1	<0.82	<0.82	**18**	<0.41	<2.0	<0.41	<0.82	<0.41	<0.41	<0.41	<0.41	<0.82	<0.82	<0.82	<0.41	<0.82	<0.82	<0.41	<0.41	<0.41	<1.1	<0.057
DG-AI11	0.5-1	DG-AI11S-0.5-1	1/21/2019	<0.73	<7.3	<1.5	<1.5	<7.3	<0.73	<3.6	**1.3**	<1.5	<0.73	<0.73	<0.73	<0.73	<1.5	<1.5	<1.5	<0.73	<1.5	<1.5	<0.73	<0.73	<0.73	<1.9	<0.10
DG-AI11 (D)	0.5-1	DG-AI11 (D)S-0.5-1	1/21/2019	<0.31	<3.1	<0.62	<0.62	<3.1	<0.31	<1.6	<0.31	<0.62	<0.31	<0.31	<0.31	<0.31	<0.62	<0.62	<0.62	<0.31	<0.62	<0.62	<0.31	<0.31	<0.31	<0.81	<0.043
DG-AI11	3.5-4	DG-AI11S-3.5-4	1/21/2019	<41	<160	<41	<41	<410	<41	<160	<41	<100	<41	<41	<41	<41	<82	<82	<82	<41	<41	<82	<41	<41	<41	<82	**46**
DG-AI11	9.5-10	DG-AI11S-9.5-10	1/21/2019	<0.55	<5.5	<1.1	<1.1	<5.5	<0.55	<2.7	<0.55	<1.1	<0.55	<0.55	<0.55	**0.77**	<1.1	**2.1**	<1.1	<0.55	<1.1	<1.1	<0.55	<0.55	<0.55	<1.4	**0.46**
DG-AI15	0.5-1	DG-AI15S-0.5-1	1/24/2019	<0.33	<3.3	<0.66	<0.66	<3.3	<0.33	<1.6	<0.33	<0.66	<0.33	<0.33	<0.33	<0.33	<0.66	<0.66	<0.66	<0.33	<0.66	<0.66	<0.33	<0.33	<0.33	<0.85	<0.046
DG-AI15	3.5-4	DG-AI15S-3.5-4	1/24/2019	<0.35	<3.5	<0.71	<0.71	<3.5	<0.35	<1.8	<0.35	<0.71	<0.35	<0.35	<0.35	<0.35	**2.2**	<0.71	<0.71	<0.35	<0.71	<0.71	<0.35	<0.35	<0.35	<0.92	<0.049
DG-AI15 (D)	3.5-4	DG-AI15 (D)S-3.5-4	1/24/2019	<0.35	<3.5	<0.70	<0.70	<3.5	<0.35	<1.8	<0.35	<0.70	<0.35	<0.35	<0.35	<0.35	**2.4**	<0.70	<0.70	<0.35	<0.70	<0.70	<0.35	<0.35	<0.35	<0.91	<0.049
DG-AI3	0.5-1	DG-AI3S-0.5-1	12/19/2018	<0.47	<4.7	<0.95	<0.95	<4.7	<0.47	<2.4	<0.47	<0.95	<0.47	<0.47	<0.47	<0.47	<0.95	<0.95	<0.95	<0.47	<0.95	<0.95	<0.47	<0.47	<0.47	<1.2	<0.066
DG-AI3	3.5-4	DG-AI3S-3.5-4	12/19/2018	<0.37	<3.7	<0.75	<0.75	<3.7	<0.37	<1.9	<0.37	<0.75	<0.37	<0.37	<0.37	<0.37	<0.75	<0.75	<0.75	<0.37	<0.75	<0.75	<0.37	<0.37	**0.4**	<0.97	<0.052
DG-AI3 (D)	3.5-4	DG-AI3 (D)S-3.5-4	12/19/2018	<0.40	<4.0	<0.81	<0.81	<4.0	<0.40	<2.0	<0.40	<0.81	<0.40	<0.40	<0.40	<0.40	<0.81	<0.81	<0.81	<0.40	<0.81	<0.81	<0.40	<0.40	**1.4**	<1.0	**0.13**
DG-AI7	0.5-1	DG-AI7S-0.5-1	1/9/2019	<0.38	<3.8	<0.76	<0.76	<3.8	<0.38	<1.9	**0.72**	<0.76	<0.38	<0.38	<0.38	<0.38	<0.76	<0.76	<0.76	<0.38	<0.76	<0.76	<0.38	**0.65**	<0.38	<0.98	<0.053
DG-AI7	3.5-4	DG-AI7S-3.5-4	1/9/2019	<0.35	<3.5	<0.69	<0.69	<3.5	<0.35	<1.7	<0.35	<0.69	<0.35	<0.35	<0.35	<0.35	<0.69	<0.69	<0.69	<0.35	<0.69	<0.69	<0.35	<0.35	<0.35	<0.90	<0.048
DG-AI7	8-8.5	DG-AI7S-8-8.5	1/9/2019	<0.50	<5.0	<0.99	<0.99	<5.0	<0.50	<2.5	<0.50	<0.99	<0.50	<0.50	<0.50	<0.50	<0.99	<0.99	<0.99	<0.50	<0.99	<0.99	<0.50	<0.50	<0.50	<1.3	<0.070

Table 5: Volatile Organic Compounds and Total Petroleum Hydrocarbons as Gasoline Concentrations in Soil
UPC OU-2
Brisbane, California

Sample Location	Depth Range (ft bgs)	Sample Name	Collection Date	1,1,1-Trichloroethane	1,1,2-Trichloro-1,2,2-trifluoroethane	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	2-Butanone	4-Isopropyltoluene	4-Methyl-2-pentanone	Benzene	Carbon disulfide	Chloroform	cis-1,2-Dichloroethene	Ethylbenzene	Isopropylbenzene	Methyl-tert-butyl ether (MTBE)	Naphthalene	n-Butylbenzene	n-Propylbenzene	sec-Butylbenzene	tert-Butylbenzene	Tetrachloroethene (PCE)	Toluene	Trichloroethene (TCE)	Xylenes, Total	TPH-Gasoline (C4-C12)
Direct Exposure Human Health Risk Level Residential Soil Exposure ESL [1]				1.7E+06	--	--	--	--	--	--	3.3E+02	--	3.2E+02	1.9E+04	5.9E+03	--	4.7E+04	3.8E+03	--	--	--	--	5.9E+02	1.1E+06	9.5E+02	5.8E+05	4.3E+05
Leaching to Groundwater Levels Non-drinking Water ESL [2]				7.0E+03	--	--	--	--	--	--	2.5E+01	--	2.3E+01	1.6E+03	4.3E+02	--	2.5E+03	1.2E+03	--	--	--	--	8.0E+01	1.0E+04	8.5E+01	1.0E+04	4.9E+03
EPA RSL for Resident Soil [3]				8.1E+06	6.7E+06	3.0E+05	2.7E+05	2.7E+07	--	3.3E+07	1.2E+03	7.7E+05	3.2E+02	1.6E+05	5.8E+03	1.9E+06	4.7E+04	3.8E+03	3.9E+06	3.8E+06	7.8E+06	7.8E+06	2.4E+04	4.9E+06	9.4E+02	5.8E+05	--
Units				µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	mg/kg
DG-AJ13	0.5-1	DG-AJ13S-0.5-1	1/29/2019	<0.50	<5.0	<1.0	<1.0	<5.0	<0.50	<2.5	<0.50	<1.0	<0.50	<0.50	<0.50	<0.50	<1.0	<1.0	<1.0	<0.50	<1.0	<1.0	<0.50	<0.50	<0.50	<1.3	<0.070
DG-AJ13	3.5-4	DG-AJ13S-3.5-4	1/29/2019	<0.35	<3.5	<0.69	<0.69	<3.5	<0.35	<1.7	<0.35	<0.69	<0.35	<0.35	<0.35	<0.35	<0.69	<0.69	<0.69	<0.35	<0.69	<0.69	<0.35	<0.35	<0.35	<0.90	<0.049
DG-AJ17	0.5-1	DG-AJ17S-0.5-1	1/24/2019	<0.35	<3.5	<0.69	<0.69	<3.5	<0.35	<1.7	<0.35	<0.69	<0.35	<0.35	<0.35	<0.35	<0.69	<0.69	<0.69	<0.35	<0.69	<0.69	<0.35	<0.35	<0.35	<0.90	<0.049
DG-AJ17	3.5-4	DG-AJ17S-3.5-4	1/24/2019	<0.36	<3.6	<0.73	<0.73	<3.6	<0.36	<1.8	<0.36	<0.73	<0.36	<0.36	<0.36	<0.36	<0.73	<0.73	<0.73	<0.36	<0.73	<0.73	<0.36	<0.36	<0.36	<0.94	<0.051
DG-AJ17	9.5-10	DG-AJ17S-9.5-10	1/24/2019	<0.33	<3.3	<0.66	<0.66	<3.3	<0.33	<1.7	<0.33	<0.66	<0.33	<0.33	<0.33	<0.33	<0.66	<0.66	<0.66	<0.33	<0.66	<0.66	<0.33	<0.33	<0.33	<0.86	<0.046
DG-AJ5	0.5-1	DG-AJ5S-0.5-1	1/8/2019	<0.37	<3.7	<0.75	<0.75	<3.7	<0.37	<1.9	<0.37	<0.75	<0.37	<0.37	<0.37	<0.37	<0.75	<0.75	<0.75	<0.37	<0.75	<0.75	<0.37	<0.37	<0.37	<0.97	<0.052
DG-AJ5	3.5-4	DG-AJ5S-3.5-4	1/8/2019	<0.33	<3.3	<0.66	<0.66	**8.6**	<0.33	<1.7	<0.33	<0.66	<0.33	<0.33	<0.33	<0.33	<0.66	<0.66	<0.66	<0.33	<0.66	<0.66	<0.33	<0.33	<0.33	<0.86	<0.046
DG-AJ9	0.5-1	DG-AJ9S-0.5-1	1/30/2019	<0.39	<3.9	<0.79	<0.79	<3.9	<0.39	<2.0	<0.39	<0.79	<0.39	<0.39	<0.39	<0.39	<0.79	<0.79	<0.79	<0.39	<0.79	<0.79	<0.39	<0.39	<0.39	<1.0	<0.055
DG-AJ9	3.5-4	DG-AJ9S-3.5-4	1/30/2019	<0.40	<4.0	<0.80	<0.80	**12**	<0.40	<2.0	<0.40	<0.80	<0.40	<0.40	<0.40	<0.40	<0.80	<0.80	<0.80	<0.40	<0.80	<0.80	<0.40	<0.40	<0.40	<1.0	<0.056
DG-AK11	0.5-1	DG-AK11S-0.5-1	1/22/2019	<0.44	<4.4	<0.88	<0.88	<4.4	**0.82**	<2.2	<0.44	<0.88	<0.44	<0.44	<0.44	**2**	<0.88	**1.1**	**0.9**	**0.66**	<0.88	<0.88	<0.44	<0.44	<0.44	**1.3**	**0.75**
DG-AK11	3.5-4	DG-AK11S-3.5-4	1/22/2019	<150	<590	<150	<150	<1,500	<150	<590	<150	<370	<150	<150	<150	<150	<300	<300	<300	<150	<150	<300	<150	<150	<150	<300	**100**
DG-AK15	0.5-1	DG-AK15S-0.5-1	1/23/2019	<0.43	<4.3	<0.87	<0.87	<4.3	<0.43	<2.2	<0.43	<0.87	<0.43	<0.43	<0.43	<0.43	<0.87	<0.87	<0.87	<0.43	<0.87	<0.87	**3.9**	<0.43	<0.43	<1.1	<0.061
DG-AK15	3.5-4	DG-AK15S-3.5-4	1/23/2019	<0.39	<3.9	<0.79	<0.79	<3.9	<0.39	<2.0	<0.39	<0.79	<0.39	<0.39	<0.39	<0.39	<0.79	<0.79	<0.79	<0.39	<0.79	<0.79	**11**	<0.39	<0.39	<1.0	<0.055
DG-AK3	0.5-1	DG-AK3S-0.5-1	12/19/2018	<0.32	<3.2	<0.65	<0.65	<3.2	<0.32	<1.6	<0.32	<0.65	<0.32	<0.32	<0.32	<0.32	<0.65	<0.65	<0.65	<0.32	<0.65	<0.65	<0.32	<0.32	<0.32	<0.84	<0.045
DG-AK3	3.5-4	DG-AK3S-3.5-4	12/19/2018	<0.42	<4.2	<0.83	<0.83	<4.2	<0.42	<2.1	<0.42	<0.83	<0.42	<0.42	<0.42	<0.42	<0.83	<0.83	<0.83	<0.42	<0.83	<0.83	<0.42	<0.42	<0.42	<1.1	<0.058
DG-AK7	0.5-1	DG-AK7S-0.5-1	1/9/2019	<0.38	<3.8	<0.77	<0.77	<3.8	<0.38	<1.9	<0.38	<0.77	<0.38	<0.38	<0.38	<0.38	<0.77	<0.77	<0.77	<0.38	<0.77	<0.77	<0.38	<0.38	<0.38	<1.0	<0.054
DG-AK7	3.5-4	DG-AK7S-3.5-4	1/9/2019	<0.49	<4.9	<0.97	<0.97	**20**	<0.49	<2.4	<0.49	<0.97	<0.49	<0.49	<0.49	<0.49	<0.97	<0.97	<0.97	<0.49	<0.97	<0.97	<0.49	<0.49	<0.49	<1.3	<0.068
DG-AK7 (D)	3.5-4	DG-AK7 (D)S-3.5-4	1/9/2019	<0.44	<4.4	<0.88	<0.88	**22**	<0.44	<2.2	<0.44	<0.88	<0.44	<0.44	<0.44	<0.44	<0.88	<0.88	<0.88	<0.44	<0.88	<0.88	<0.44	<0.44	<0.44	<1.1	<0.062
DG-AL13	0.5-1	DG-AL13S-0.5-1	1/29/2019	<0.35	<3.5	<0.71	<0.71	<3.5	<0.35	<1.8	<0.35	<0.71	<0.35	<0.35	<0.35	<0.35	<0.71	<0.71	<0.71	<0.35	<0.71	<0.71	<0.35	<0.35	<0.35	<0.92	<0.049
DG-AL13	3.5-4	DG-AL13S-3.5-4	1/29/2019	<0.34	<3.4	<0.68	<0.68	<3.4	<0.34	<1.7	<0.34	<0.68	<0.34	<0.34	<0.34	<0.34	<0.68	<0.68	<0.68	<0.34	<0.68	<0.68	<0.34	<0.34	<0.34	<0.88	<0.048
DG-AL5	0.5-1	DG-AL5S-0.5-1	1/30/2019	<0.39	<3.9	<0.78	<0.78	<3.9	<0.39	<2.0	<0.39	<0.78	<0.39	<0.39	<0.39	<0.39	<0.78	<0.78	<0.78	<0.39	<0.78	<0.78	<0.39	<0.39	<0.39	<1.0	<0.055
DG-AL5	3.5-4	DG-AL5S-3.5-4	1/30/2019	<0.33	<3.3	<0.65	<0.65	<3.3	<0.33	<1.6	<0.33	<0.65	<0.33	<0.33	<0.33	<0.33	<0.65	<0.65	<0.65	<0.33	<0.65	<0.65	<0.33	<0.33	<0.33	<0.85	<0.046
DG-AL5 (D)	3.5-4	DG-AL5 (D)S-3.5-4	1/30/2019	<0.30	<3.0	<0.59	<0.59	**5.4**	<0.30	<1.5	<0.30	<0.59	<0.30	<0.30	<0.30	<0.30	<0.59	<0.59	<0.59	<0.30	<0.59	<0.59	<0.30	**0.71**	<0.30	<0.77	<0.041
DG-AL9	0.5-1	DG-AL9S-0.5-1	1/21/2019	<0.42	<4.2	<0.84	<0.84	<4.2	<0.42	<2.1	<0.42	<0.84	<0.42	<0.42	<0.42	<0.42	<0.84	<0.84	<0.84	<0.42	<0.84	<0.84	<0.42	<0.42	<0.42	<1.1	<0.059
DG-AL9	3.5-4	DG-AL9S-3.5-4	1/21/2019	<0.34	<3.4	<0.68	<0.68	<3.4	<0.34	<1.7	<0.34	<0.68	<0.34	<0.34	<0.34	<0.34	<0.68	<0.68	<0.68	<0.34	<0.68	<0.68	<0.34	<0.34	<0.34	<0.89	<0.048
DG-AL9	7-7.5	DG-AL9S-7-7.5	1/21/2019	<0.32	<3.2	<0.64	<0.64	<3.2	<0.32	<1.6	<0.32	<0.64	<0.32	<0.32	<0.32	<0.32	<0.64	<0.64	<0.64	<0.32	<0.64	<0.64	<0.32	<0.32	<0.32	<0.83	<0.045
DG-AL9 (D)	7-7.5	DG-AL9 (D)S-7-7.5	1/21/2019	<0.27	<2.7	<0.54	<0.54	<2.7	<0.27	<1.3	<0.27	<0.54	<0.27	<0.27	<0.27	<0.27	<0.54	<0.54	<0.54	<0.27	<0.54	<0.54	<0.27	<0.27	<0.27	<0.70	<0.038
DG-AM11	0.5-1	DG-AM11S-0.5-1	1/22/2019	<0.37	<3.7	<0.75	<0.75	<3.7	<0.37	<1.9	<0.37	<0.75	<0.37	<0.37	<0.37	<0.37	<0.75	<0.75	<0.75	<0.37	<0.75	<0.75	<0.37	<0.37	<0.37	<0.97	<0.052
DG-AM11	3.5-4	DG-AM11S-3.5-4	1/22/2019	<0.39	<3.9	<0.78	<0.78	<3.9	<0.39	<1.9	**0.45**	<0.78	<0.39	<0.39	<0.39	<0.39	<0.78	<0.78	<0.78	<0.39	<0.78	<0.78	<0.39	<0.39	<0.39	<1.0	<0.054
DG-AM15	0.5-1	DG-AM15S-0.5-1	1/23/2019	<0.47	**7.5**	<0.94	<0.94	<4.7	<0.47	<2.3	<0.47	<0.94	<0.47	<0.47	<0.47	<0.47	<0.94	<0.94	<0.94	<0.47	<0.94	<0.94	<0.47	<0.47	<0.47	<1.2	<0.066
DG-AM15	3.5-4	DG-AM15S-3.5-4	1/23/2019	<0.42	<4.2	<0.85	<0.85	<4.2	<0.42	<2.1	<0.42	<0.85	<0.42	<0.42	<0.42	<0.42	<0.85	<0.85	<0.85	<0.42	<0.85	<0.85	<0.42	<0.42	<0.42	<1.1	<0.059
DG-AM15	9.5-10	DG-AM15S-9.5-10	1/23/2019	<0.43	<4.3	<0.86	<0.86	<4.3	<0.43	<2.1	<0.43	**3.3**	<0.43	<0.43	<0.43	<0.43	<0.86	<0.86	<0.86	<0.43	<0.86	<0.86	<0.43	<0.43	<0.43	<1.1	<0.060
DG-AM15 (D)	9.5-10	DG-AM15 (D)S-9.5-10	1/23/2019	<0.58	<5.8	<1.2	<1.2	<5.8	<0.58	<2.9	<0.58	<1.2	<0.58	<0.58	<0.58	<0.58	<1.2	<1.2	<1.2	<0.58	<1.2	<1.2	<0.58	<0.58	<0.58	<1.5	<0.081
DG-AM3	0.5-1	DG-AM3S-0.5-1	12/19/2018	<0.41	<4.1	<0.82	<0.82	<4.1	<0.41	<2.1	<0.41	<0.82	<0.41	<0.41	<0.41	<0.41	<0.82	<0.82	<0.82	<0.41	<0.82	<0.82	<0.41	<0.41	<0.41	<1.1	<0.057
DG-AM3	3.5-4	DG-AM3S-3.5-4	12/19/2018	<0.34	<3.4	<0.68	<0.68	<3.4	<0.34	<1.7	<0.34	<0.68	<0.34	<0.34	<0.34	<0.34	**0.82**	<0.68	<0.68	<0.34	<0.68	<0.68	<0.34	**0.37**	<0.34	<0.88	**0.058**
DG-AM7	0.5-1	DG-AM7S-0.5-1	1/9/2019	<0.32	<3.2	<0.63	<0.63	<3.2	<0.32	<1.6	<0.32	<0.63	<0.32	<0.32	<0.32	<0.32	<0.63	<0.63	<0.63	<0.32	<0.63	<0.63	<0.32	<0.32	<0.32	<0.82	<0.044
DG-AM7	3.5-4	DG-AM7S-3.5-4	1/9/2019	<0.46	<4.6	<0.92	<0.92	<4.6	<0.46	<2.3	<0.46	<0.92	<0.46	<0.46	<0.46	<0.46	<0.92	<0.92	<0.92	<0.46	<0.92	<0.92	<0.46	<0.46	<0.46	<1.2	<0.064
DG-AM7	7.5-8	DG-AM7S-7.5-8	1/9/2019	<0.42	<4.2	<0.84	<0.84	<4.2	<0.42	<2.1	<0.42	<0.84	<0.42	<0.42	<0.42	<0.42	<0.84	<0.84	<0.84	<0.42	<0.84	<0.84	<0.42	<0.42	<0.42	<1.1	<0.059
DG-AN13	0.5-1	DG-AN13S-0.5-1	1/31/2019	<0.48	<4.8	<0.96	<0.96	<4.8	<0.48	<2.4	<0.48	<0.96	<0.48	<0.48	<0.48	<0.48	<0.96	<0.96	<0.96	<0.48	<0.96	<0.96	<0.48	<0.48	<0.48	<1.3	<0.067
DG-AN13	3.5-4	DG-AN13S-3.5-4	1/31/2019	<0.36	<3.6	<0.72	<0.72	<3.6	<0.36	<1.8	<0.36	<0.72	<0.36	<0.36	<0.36	<0.36	<0.72	<0.72	<0.72	<0.36	<0.72	<0.72	<0.36	<0.36	<0.36	<0.93	<0.050
DG-AN13	9.5-10	DG-AN13S-9.5-10	1/31/2019	<0.50	<5.0	<0.99	<0.99	**46**	<0.50	<2.5	<0.50	**1.4**	<0.50	<0.50	<0.50	<0.50	<0.99	<0.99	**1.2**	<0.50	<0.99	<0.99	<0.50	<0.50	<0.50	<1.3	**0.079**
DG-AN5	0.5-1	DG-AN5S-0.5-1	12/20/2018	<0.35	<3.5	<0.70	<0.70	<3.5	<0.35	<1.8	<0.35	<0.70	<0.35	<0.35	<0.35	<0.35	<0.70	<0.70	<0.70	<0.35	<0.70	<0.70	<0.35	<0.35	<0.35	<0.92	<0.049
DG-AN5	0.5-1	DG-AN5S-0.5-1	2/1/2019	<0.51	<5.1	<1.0	<1.0	<5.1	<0.51	<2.6	<0.51	<1.0	<0.51	<0.51	<0.51	<0.51	<1.0	<1.0	<1.0	<0.51	<1.0	<1.0	<0.51	<0.51	<0.51	<1.3	<0.072
DG-AN5	3.5-4	DG-AN5S-3.5-4	12/20/2018	<0.32	<3.2	<0.65	<0.65	<3.2	<0.32	<1.6	<0.32	<0.65	<0.32	<0.32	<0.32	<0.32	<0.65	<0.65	<0.65	<0.32	<0.65	<0.65	<0.32	<0.32	<0.32	<0.84	<0.045
DG-AN5	3.5-4	DG-AN5S-3.5-4	2/1/2019	<0.35	<3.5	<0.70	<0.70	<3.5	<0.35	<1.8	<0.35	<0.70	<0.35	<0.35	<0.35	<0.35	<0.70	<0.70	<0.70	<0.35	<0.70	<0.70	<0.35	<0.35	<0.35	<0.91	<0.049
DG-AN9	0.5-1	DG-AN9S-0.5-1	1/21/2019	<0.34	<3.4	<0.67	<0.67	<3.4	<0.34	<1.7	<0.34	<0.67	<0.34	<0.34	<0.34	<0.34	<0.67	<0.67	<0.67	<0.34	<0.67	<0.67	<0.34	<0.34	<0.34	<0.88	<0.047

Table 5: Volatile Organic Compounds and Total Petroleum Hydrocarbons as Gasoline Concentrations in Soil
UPC OU-2
Brisbane, California

Sample Location	Depth Range (ft bgs)	Sample Name	Collection Date	1,1,1-Trichloroethane	1,1,2-Trichloro-1,2,2-trifluoroethane	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	2-Butanone	4-Isopropyltoluene	4-Methyl-2-pentanone	Benzene	Carbon disulfide	Chloroform	cis-1,2-Dichloroethene	Ethylbenzene	Isopropylbenzene	Methyl-tert-butyl ether (MTBE)	Naphthalene	n-Butylbenzene	n-Propylbenzene	sec-Butylbenzene	tert-Butylbenzene	Tetrachloroethene (PCE)	Toluene	Trichloroethene (TCE)	Xylenes, Total	TPH-Gasoline (C4-C12)
Direct Exposure Human Health Risk Level Residential Soil Exposure ESL [1]				1.7E+06	--	--	--	--	--	--	3.3E+02	--	3.2E+02	1.9E+04	5.9E+03	--	4.7E+04	3.8E+03	--	--	--	--	5.9E+02	1.1E+06	9.5E+02	5.8E+05	4.3E+05
Leaching to Groundwater Levels Non-drinking Water ESL [2]				7.0E+03	--	--	--	--	--	--	2.5E+01	--	2.3E+01	1.6E+03	4.3E+02	--	2.5E+03	1.2E+03	--	--	--	--	8.0E+01	1.0E+04	8.5E+01	1.0E+04	4.9E+03
EPA RSL for Resident Soil [3]				8.1E+06	6.7E+06	3.0E+05	2.7E+05	2.7E+07	--	3.3E+07	1.2E+03	7.7E+05	3.2E+02	1.6E+05	5.8E+03	1.9E+06	4.7E+04	3.8E+03	3.9E+06	3.8E+06	7.8E+06	7.8E+06	2.4E+04	4.9E+06	9.4E+02	5.8E+05	--
Units				µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	mg/kg
DG-AN9	3.5-4	DG-AN9S-3.5-4	1/21/2019	<0.40	<4.0	<0.79	<0.79	<4.0	<0.40	<2.0	**0.79**	<0.79	<0.40	<0.40	<0.40	<0.40	<0.79	<0.79	<0.79	<0.40	<0.79	<0.79	<0.40	<0.40	<0.40	<1.0	<0.055
DG-AN9	7-7.5	DG-AN9S-7-7.5	1/21/2019	<0.35	<3.5	<0.70	<0.70	<3.5	<0.35	<1.8	<0.35	<0.70	<0.35	<0.35	<0.35	<0.35	<0.70	<0.70	<0.70	<0.35	<0.70	<0.70	<0.35	<0.35	<0.35	<0.91	<0.049
DG-AO11	0.5-1	DG-AO11S-0.5-1	1/22/2019	<0.40	<4.0	<0.79	<0.79	<4.0	<0.40	<2.0	<0.40	<0.79	<0.40	<0.40	<0.40	<0.40	<0.79	<0.79	<0.79	<0.40	<0.79	<0.79	<0.40	<0.40	<0.40	<1.0	<0.055
DG-AO11	3.5-4	DG-AO11S-3.5-4	1/22/2019	<150	<590	<150	<150	<1,500	<150	<590	<150	<370	<150	<150	<150	<150	<300	<300	<300	<150	<150	<300	<150	<150	<150	<300	**270**
DG-AO3	0.5-1	DG-AO3S-0.5-1	12/19/2018	<0.37	<3.7	<0.74	<0.74	<3.7	<0.37	<1.9	<0.37	<0.74	<0.37	<0.37	<0.37	<0.37	<0.74	<0.74	<0.74	<0.37	<0.74	<0.74	<0.37	<0.37	<0.37	<0.96	<0.052
DG-AO3	3.5-4	DG-AO3S-3.5-4	12/19/2018	<0.41	<4.1	<0.83	<0.83	<4.1	<0.41	<2.1	<0.41	<0.83	<0.41	<0.41	<0.41	<0.41	**1.2**	<0.67	<0.83	<0.41	<0.83	<0.83	<0.41	<0.41	<0.41	<1.1	<0.058
DG-AO7	0.5-1	DG-AO7S-0.5-1	1/9/2019	<0.32	<3.2	<0.64	<0.64	<3.2	<0.32	<1.6	<0.32	<0.64	<0.32	<0.32	<0.32	<0.32	<0.64	<0.64	<0.64	<0.32	<0.64	<0.64	<0.32	<0.32	<0.32	<0.84	<0.045
DG-AO7	3.5-4	DG-AO7S-3.5-4	1/9/2019	<0.40	<4.0	<0.80	<0.80	<4.0	<0.40	<2.0	<0.40	<0.80	<0.40	<0.40	<0.40	<0.40	<0.80	<0.80	<0.80	<0.40	<0.80	<0.80	<0.40	<0.40	<0.40	<1.0	<0.056
DG-AP13	0.5-1	DG-AP13S-0.5-1	1/23/2019	<0.33	<3.3	<0.66	<0.66	<3.3	<0.33	<1.7	<0.33	<0.66	<0.33	<0.33	<0.33	<0.33	<0.66	<0.66	<0.66	<0.33	<0.66	<0.66	<0.33	<0.33	<0.33	<0.86	<0.046
DG-AP13 (D)	0.5-1	DG-AP13 (D)S-0.5-1	1/23/2019	<0.38	<3.8	<0.75	<0.75	<3.8	<0.38	<1.9	<0.38	<0.75	<0.38	<0.38	<0.38	<0.38	<0.75	<0.75	<0.75	<0.38	<0.75	<0.75	<0.38	<0.38	<0.38	<0.98	<0.053
DG-AP13	3.5-4	DG-AP13S-3.5-4	1/23/2019	<0.36	<3.6	<0.73	<0.73	<3.6	<0.36	<1.8	<0.36	<0.73	<0.36	<0.36	<0.36	<0.36	<0.73	<0.73	<0.73	<0.36	<0.73	<0.73	<0.36	<0.36	<0.36	<0.94	<0.051
DG-AP13	9.5-10	DG-AP13S-9.5-10	1/23/2019	<0.46	<4.6	<0.91	<0.91	<4.6	<0.46	<2.3	**3.9**	<0.91	<0.46	<0.46	<0.46	<0.46	<0.91	<0.91	<0.91	<0.46	<0.91	<0.91	**0.64**	**1.7**	<0.46	<1.2	<0.064
DG-AP5	0.5-1	DG-AP5S-0.5-1	12/20/2018	<0.46	<4.6	<0.92	<0.92	<4.6	<0.46	<2.3	<0.46	<0.92	<0.46	<0.46	<0.46	<0.46	<0.92	<0.92	<0.92	<0.46	<0.92	<0.92	<0.46	<0.46	<0.46	<1.2	<0.064
DG-AP5	3.5-4	DG-AP5S-3.5-4	12/20/2018	<0.42	<4.2	<0.84	<0.84	<4.2	<0.42	<2.1	<0.42	<0.84	<0.42	<0.42	<0.42	<0.42	<0.84	<0.84	<0.84	<0.42	<0.84	<0.84	<0.42	<0.42	<0.42	<1.1	<0.059
DG-AP5	3.5-4	DG-AP5S-3.5-4	2/1/2019	<0.35	<3.5	<0.71	<0.71	<3.5	<0.35	<1.8	<0.35	<0.71	<0.35	<0.35	<0.35	<0.35	<0.71	<0.71	<0.71	<0.35	<0.71	<0.71	<0.35	<0.35	<0.35	<0.92	<0.049
DG-AP9	0.5-1	DG-AP9S-0.5-1	1/21/2019	<0.34	<3.4	<0.69	<0.69	<3.4	<0.34	<1.7	<0.34	<0.69	<0.34	<0.34	<0.34	<0.34	<0.69	<0.69	<0.69	<0.34	<0.69	<0.69	<0.34	<0.34	<0.34	<0.90	<0.048
DG-AP9	3.5-4	DG-AP9S-3.5-4	1/21/2019	<0.85	<8.5	<1.7	<1.7	<8.5	<0.85	<4.3	**3**	<1.7	<0.85	<0.85	<0.85	<0.85	<1.7	<1.7	<1.7	<0.85	<1.7	<1.7	<0.85	**1.8**	<0.85	<2.2	<0.12
DG-AQ11	0.5-1	DG-AQ11S-0.5-1	1/30/2019	<0.42	<4.2	<0.85	<0.85	<4.2	<0.42	<2.1	<0.42	<0.85	<0.42	<0.42	<0.42	<0.42	<0.85	<0.85	<0.85	<0.42	<0.85	<0.85	<0.42	<0.42	<0.42	<1.1	<0.059
DG-AQ11	3.5-4	DG-AQ11S-3.5-4	1/30/2019	<0.47	<4.7	<0.94	<0.94	<4.7	<0.47	<2.3	<0.47	<0.94	<0.47	<0.47	<0.47	<0.47	<0.94	<0.94	<0.94	<0.47	<0.94	<0.94	<0.47	<0.47	<0.47	<1.2	<0.066
DG-AQ3	0.5-1	DG-AQ3S-0.5-1	12/19/2018	<0.42	<4.2	<0.84	<0.84	<4.2	<0.42	<2.1	<0.42	<0.84	<0.42	<0.42	<0.42	<0.42	<0.84	<0.84	<0.84	<0.42	<0.84	<0.84	<0.42	<0.42	<0.42	<1.1	<0.059
DG-AQ3	3.5-4	DG-AQ3S-3.5-4	12/19/2018	<0.37	<3.7	<0.74	<0.74	<3.7	<0.37	<1.9	<0.37	<0.74	<0.37	<0.37	<0.37	<0.37	<0.74	<0.74	<0.74	<0.37	<0.74	<0.74	<0.37	<0.37	<0.37	<0.97	<0.052
DG-AQ7	0.5-1	DG-AQ7S-0.5-1	1/30/2019	<0.41	<4.1	<0.82	<0.82	<4.1	<0.41	<2.0	<0.41	<0.82	<0.41	<0.41	<0.41	<0.41	<0.82	<0.82	<0.82	<0.41	<0.82	<0.82	<0.41	<0.41	<0.41	<1.1	<0.057
DG-AQ7	3.5-4	DG-AQ7S-3.5-4	1/30/2019	<0.38	<3.8	<0.77	<0.77	<3.8	<0.38	<1.9	<0.38	<0.77	<0.38	<0.38	<0.38	<0.38	<0.77	<0.77	<0.77	<0.38	<0.77	<0.77	<0.38	<0.38	<0.38	<1.0	<0.054
DG-AR13	0.5-1	DG-AR13S-0.5-1	1/23/2019	<0.41	<4.1	<0.83	<0.83	<4.1	<0.41	<2.1	<0.41	<0.83	<0.41	<0.41	<0.41	<0.41	<0.83	<0.83	<0.83	<0.41	<0.83	<0.83	<0.41	<0.41	<0.41	<1.1	<0.058
DG-AR13	3.5-4	DG-AR13S-3.5-4	1/23/2019	<0.38	<3.8	<0.76	<0.76	<3.8	<0.38	<1.9	<0.38	<0.76	<0.38	<0.38	<0.38	<0.38	<0.76	<0.76	<0.76	<0.38	<0.76	<0.76	<0.38	<0.38	<0.38	<0.99	<0.054
DG-AR13	9.5-10	DG-AR13S-9.5-10	1/23/2019	<0.50	<5.0	<0.99	<0.99	<5.0	<0.50	<2.5	**7.1**	<0.99	<0.50	<0.50	<0.50	<0.50	<0.99	<0.99	<0.99	<0.50	<0.99	<0.99	<0.50	**2**	<0.50	<1.3	<0.069
DG-AR5	0.5-1	DG-AR5S-0.5-1	12/20/2018	<0.40	<4.0	<0.80	<0.80	<4.0	<0.40	<2.0	<0.40	<0.80	<0.40	<0.40	<0.40	<0.40	<0.80	<0.80	<0.80	<0.40	<0.80	<0.80	<0.40	<0.40	<0.40	<1.0	<0.056
DG-AR5	3.5-4	DG-AR5S-3.5-4	12/20/2018	<0.37	<3.7	<0.75	<0.75	<3.7	<0.37	<1.9	<0.37	<0.75	<0.37	<0.37	<0.37	<0.37	<0.75	<0.75	<0.75	<0.37	<0.75	<0.75	<0.37	<0.37	<0.37	<0.97	<0.052
DG-AR9	0.5-1	DG-AR9S-0.5-1	1/9/2019	<0.34	<3.4	<0.68	<0.68	<3.4	<0.34	<1.7	<0.34	<0.68	<0.34	<0.34	<0.34	<0.34	<0.68	<0.68	<0.68	<0.34	<0.68	<0.68	<0.34	<0.34	<0.34	<0.89	<0.048
DG-AR9	3.5-4	DG-AR9S-3.5-4	1/9/2019	<0.44	<4.4	<0.88	<0.88	<4.4	<0.44	<2.2	<0.44	<0.88	<0.44	<0.44	<0.44	<0.44	<0.88	<0.88	<0.88	<0.44	<0.88	<0.88	<0.44	<0.44	<0.44	<1.2	<0.062
DG-AR9 (D)	3.5-4	DG-AR9 (D)S-3.5-4	1/9/2019	<0.33	<3.3	<0.67	<0.67	<3.3	<0.33	<1.7	<0.33	<0.67	<0.33	<0.33	<0.33	<0.33	<0.67	<0.67	<0.67	<0.33	<0.67	<0.67	<0.33	<0.33	<0.33	<0.87	<0.047
DG-AS11	0.5-1	DG-AS11S-0.5-1	1/31/2019	<0.41	<4.1	<0.83	<0.83	<4.1	<0.41	<2.1	<0.41	<0.83	<0.41	<0.41	<0.41	<0.41	<0.83	<0.83	<0.83	<0.41	<0.83	<0.83	<0.41	<0.41	<0.41	<1.1	<0.058
DG-AS11	3.5-4	DG-AS11S-3.5-4	1/31/2019	<0.51	<5.1	<1.0	<1.0	<5.1	<0.51	<2.6	<0.51	<1.0	<0.51	<0.51	<0.51	<0.51	<1.0	<1.0	<1.0	<0.51	<1.0	<1.0	<0.51	<0.51	<0.51	<1.3	<0.072
DG-AS11	7.5-8	DG-AS11S-7.5-8	1/31/2019	<0.39	<3.9	<0.78	<0.78	<3.9	<0.39	<1.9	<0.39	<0.78	<0.39	<0.39	<0.39	<0.39	<0.78	<0.78	<0.78	<0.39	<0.78	<0.78	<0.39	<0.39	<0.39	<1.0	<0.054
DG-AS3	0.5-1	DG-AS3S-0.5-1	12/20/2018	<0.45	<4.5	<0.90	<0.90	<4.5	<0.45	<2.3	<0.45	<0.90	<0.45	<0.45	<0.45	<0.45	<0.90	<0.90	<0.90	<0.45	<0.90	<0.90	<0.45	<0.45	<0.45	<1.2	<0.063
DG-AS3 (D)	0.5-1	DG-AS3 (D)S-0.5-1	12/20/2018	<0.39	<3.9	<0.78	<0.78	<3.9	<0.39	<2.0	<0.39	<0.78	<0.39	<0.39	<0.39	<0.39	<0.78	<0.78	<0.78	<0.39	<0.78	<0.78	<0.39	<0.39	<0.39	<1.0	<0.055
DG-AS3	3.5-4	DG-AS3S-3.5-4	12/20/2018	<0.29	<2.9	<0.59	<0.59	<2.9	<0.29	<1.5	<0.29	<0.59	<0.29	<0.29	<0.29	<0.29	<0.59	<0.59	<0.59	<0.29	<0.59	<0.59	<0.29	<0.29	<0.29	<0.76	<0.041
DG-AS3	4.5-5	DG-AS3S-4.5-5	12/20/2018	<0.36	<3.6	<0.72	<0.72	<3.6	<0.36	<1.8	<0.36	<0.72	<0.36	<0.36	<0.36	<0.36	<0.72	<0.72	<0.72	<0.36	<0.72	<0.72	<0.36	<0.36	<0.36	<0.94	<0.050
DG-AS7	0.5-1	DG-AS7S-0.5-1	1/9/2019	<0.45	<4.5	<0.90	<0.90	<4.5	<0.45	<2.3	<0.45	<0.90	<0.45	<0.45	<0.45	<0.45	<0.90	<0.90	<0.90	<0.45	<0.90	<0.90	<0.45	<0.45	<0.45	<1.2	<0.063
DG-AS7	3.5-4	DG-AS7S-3.5-4	1/9/2019	<0.38	<3.8	<0.77	<0.77	<3.8	<0.38	<1.9	<0.38	<0.77	<0.38	<0.38	<0.38	<0.38	<0.77	<0.77	<0.77	<0.38	<0.77	<0.77	<0.38	<0.38	<0.38	<1.0	<0.054
DG-AT12	0.5-1	DG-AT12S-0.5-1	1/23/2019	<0.47	<4.7	<0.95	<0.95	<4.7	<0.47	<2.4	**1**	<0.95	<0.47	<0.47	<0.47	<0.47	<0.95	<0.95	<0.95	<0.47	<0.95	<0.95	<0.47	**1.7**	<0.47	<1.2	**0.18**
DG-AT12	3.5-4	DG-AT12S-3.5-4	1/23/2019	<0.57	<5.7	<1.1	<1.1	<5.7	<0.57	<2.9	<0.57	<1.1	**1.4**	<0.57	<0.57	<0.57	<1.1	<1.1	<1.1	<0.57	<1.1	<1.1	<0.57	<0.57	<0.57	<1.5	<0.080
DG-AT12	9.5-10	DG-AT12S-9.5-10	1/23/2019	<0.45	<4.5	<0.90	<0.90	<4.5	<0.45	<2.2	<0.45	<0.90	<0.45	<0.45	<0.45	<0.45	<0.90	<0.90	<0.90	<0.45	<0.90	<0.90	<0.45	<0.45	<0.45	<1.2	<0.063
DG-AT5	0.5-1	DG-AT5S-0.5-1	12/20/2018	<0.45	<4.5	<0.91	<0.91	<4.5	<0.45	<2.3	<0.45	<0.91	<0.45	<0.45	<0.45	<0.45	<0.91	<0.91	<0.91	<0.45	<0.91	<0.91	<0.45	<0.45	<0.45	<1.2	<0.064
DG-AT5	0.5-1	DG-AT5S-0.5-1	2/4/2019	<0.37	<3.7	<0.75	<0.75	<3.7	<0.37	<1.9	<0.37	<0.75	<0.37	<0.37	<0.37	<0.37	<0.75	<0.75	<0.75	<0.37	<0.75	<0.75	<0.37	<0.37	<0.37	<0.97	<0.052
DG-AT5	3.5-4	DG-AT5S-3.5-4	12/20/2018	<0.44	<4.4	<0.88	<0.88	<4.4	<0.44	<2.2	<0.44	<0.88	<0.44	<0.44	<0.44	<0.44	<0.88	<0.88	<0.88	<0.44	<0.88	<0.88	<0.44	<0.44	<0.44	<1.1	<0.062

Table 5: Volatile Organic Compounds and Total Petroleum Hydrocarbons as Gasoline Concentrations in Soil
UPC OU-2
Brisbane, California

Sample Location	Depth Range (ft bgs)	Sample Name	Collection Date	1,1,1-Trichloroethane	1,1,2-Trichloro-1,2,2-trifluoroethane	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	2-Butanone	4-Isopropyltoluene	4-Methyl-2-pentanone	Benzene	Carbon disulfide	Chloroform	cis-1,2-Dichloroethene	Ethylbenzene	Isopropylbenzene	Methyl-tert-butyl ether (MTBE)	Naphthalene	n-Butylbenzene	n-Propylbenzene	sec-Butylbenzene	tert-Butylbenzene	Tetrachloroethene (PCE)	Toluene	Trichloroethene (TCE)	Xylenes, Total	TPH-Gasoline (C4-C12)
Direct Exposure Human Health Risk Level Residential Soil Exposure ESL [1]				1.7E+06	--	--	--	--	--	--	3.3E+02	--	3.2E+02	1.9E+04	5.9E+03	--	4.7E+04	3.8E+03	--	--	--	--	5.9E+02	1.1E+06	9.5E+02	5.8E+05	4.3E+05
Leaching to Groundwater Levels Non-drinking Water ESL [2]				7.0E+03	--	--	--	--	--	--	2.5E+01	--	2.3E+01	1.6E+03	4.3E+02	--	2.5E+03	1.2E+03	--	--	--	--	8.0E+01	1.0E+04	8.5E+01	1.0E+04	4.9E+03
EPA RSL for Resident Soil [3]				8.1E+06	6.7E+06	3.0E+05	2.7E+05	2.7E+07	--	3.3E+07	1.2E+03	7.7E+05	3.2E+02	1.6E+05	5.8E+03	1.9E+06	4.7E+04	3.8E+03	3.9E+06	3.8E+06	7.8E+06	7.8E+06	2.4E+04	4.9E+06	9.4E+02	5.8E+05	--
Units				µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	mg/kg
DG-AT5	3.5-4	DG-AT5S-3.5-4	2/4/2019	<0.33	<3.3	<0.66	<0.66	<3.3	<0.33	<1.7	<0.33	<0.66	<0.33	<0.33	<0.33	<0.33	<0.66	<0.66	<0.66	<0.33	<0.66	<0.66	<0.33	<0.33	<0.33	<0.86	<0.046
DG-AT9	0.5-1	DG-AT9S-0.5-1	1/30/2019	<0.47	<4.7	<0.94	<0.94	<4.7	<0.47	<2.4	<0.47	<0.94	<0.47	<0.47	<0.47	<0.47	<0.94	<0.94	<0.94	<0.47	<0.94	<0.94	<0.47	<0.47	<0.47	<1.2	<0.066
DG-AT9	3.5-4	DG-AT9S-3.5-4	1/30/2019	<0.39	<3.9	<0.78	<0.78	<3.9	<0.39	<2.0	**1.1**	<0.78	<0.39	<0.39	<0.39	<0.39	<0.78	<0.78	<0.78	<0.39	<0.78	<0.78	<0.39	**0.52**	<0.39	<1.0	<0.055
DG-AU11	0.5-1	DG-AU11S-0.5-1	1/23/2019	<0.37	<3.7	<0.75	<0.75	<3.7	<0.37	<1.9	<0.37	<0.75	<0.37	<0.37	<0.37	<0.37	<0.75	<0.75	<0.75	<0.37	<0.75	<0.75	<0.37	<0.37	<0.37	<0.97	<0.052
DG-AU11	3.5-4	DG-AU11S-3.5-4	1/23/2019	<0.35	<3.5	<0.70	<0.70	**5.3**	<0.35	<1.8	<0.35	<0.70	<0.35	<0.35	<0.35	<0.35	<0.70	<0.70	<0.70	<0.35	<0.70	<0.70	<0.35	<0.35	<0.35	<0.91	<0.049
DG-AU11	9.5-10	DG-AU11S-9.5-10	1/23/2019	<0.44	<4.4	<0.89	<0.89	**5.6**	<0.44	<2.2	**2.3**	<0.89	<0.44	<0.44	<0.44	<0.44	<0.89	<0.89	<0.89	<0.44	<0.89	<0.89	<0.44	**0.62**	<0.44	<1.2	<0.062
DG-AU3	0.5-1	DG-AU3S-0.5-1	12/20/2018	<0.43	<4.3	<0.85	<0.85	<4.3	<0.43	<2.1	<0.43	<0.85	<0.43	<0.43	<0.43	<0.43	<0.85	<0.85	<0.85	<0.43	<0.85	<0.85	<0.43	<0.43	<0.43	<1.1	<0.060
DG-AU3	3.5-4	DG-AU3S-3.5-4	12/20/2018	<0.51	<5.1	<1.0	<1.0	<5.1	<0.51	<2.6	<0.51	<1.0	<0.51	<0.51	<0.51	<0.51	<1.0	<1.0	<1.0	<0.51	<1.0	<1.0	<0.51	<0.51	<0.51	<1.3	<0.072
DG-AU7	0.5-1	DG-AU7S-0.5-1	1/9/2019	<0.43	<4.3	<0.87	<0.87	<4.3	<0.43	<2.2	<0.43	<0.87	<0.43	<0.43	<0.43	<0.43	<0.87	<0.87	<0.87	<0.43	<0.87	<0.87	<0.43	<0.43	<0.43	<1.1	<0.061
DG-AU7 (D)	0.5-1	DG-AU7 (D)S-0.5-1	1/9/2019	<0.40	<4.0	<0.80	<0.80	<4.0	<0.40	<2.0	<0.40	<0.80	<0.40	<0.40	<0.40	<0.40	<0.80	<0.80	<0.80	<0.40	<0.80	<0.80	<0.40	<0.40	<0.40	<1.0	<0.056
DG-AU7	3.5-4	DG-AU7S-3.5-4	1/9/2019	<0.41	<4.1	<0.83	<0.83	<4.1	<0.41	<2.1	<0.41	<0.83	<0.41	<0.41	<0.41	<0.41	<0.83	<0.83	<0.83	<0.41	<0.83	<0.83	<0.41	<0.41	<0.41	<1.1	<0.058
DG-AV5	0.5-1	DG-AV5S-0.5-1	12/20/2018	<0.42	<4.2	<0.83	<0.83	<4.2	<0.42	<2.1	<0.42	<0.83	<0.42	<0.42	<0.42	<0.42	<0.83	<0.83	<0.83	<0.42	<0.83	<0.83	<0.42	<0.42	<0.42	<1.1	<0.058
DG-AV5 (D)	0.5-1	DG-AV5 (D)S-0.5-1	12/20/2018	<0.46	<4.6	<0.91	<0.91	<4.6	<0.46	<2.3	<0.46	<0.91	<0.46	<0.46	<0.46	<0.46	<0.91	<0.91	<0.91	<0.46	<0.91	<0.91	<0.46	<0.46	<0.46	<1.2	<0.064
DG-AV5	0.5-1	DG-AV5S-0.5-1	2/1/2019	<0.38	<3.8	<0.76	<0.76	<3.8	<0.38	<1.9	<0.38	<0.76	<0.38	<0.38	<0.38	<0.38	<0.76	<0.76	<0.76	<0.38	<0.76	<0.76	<0.38	<0.38	<0.38	<0.98	<0.053
DG-AV5 (D)	0.5-1	DG-AV5 (D)S-0.5-1	2/1/2019	<0.37	<3.7	<0.74	<0.74	<3.7	<0.37	<1.8	<0.37	<0.74	<0.37	<0.37	<0.37	<0.37	<0.74	<0.74	<0.74	<0.37	<0.74	<0.74	<0.37	<0.37	<0.37	<0.96	<0.052
DG-AV5	3.5-4	DG-AV5S-3.5-4	12/20/2018	<0.40	<4.0	<0.80	<0.80	<4.0	<0.40	<2.0	<0.40	<0.80	<0.40	<0.40	<0.40	<0.40	<0.80	<0.80	<0.80	<0.40	<0.80	<0.80	<0.40	**0.7**	<0.40	<1.0	<0.051
DG-AV5	3.5-4	DG-AV5S-3.5-4	2/1/2019	<0.63	<6.3	<1.3	<1.3	<6.3	<0.63	<3.1	**0.71**	<1.3	<0.63	<0.63	<0.63	<0.63	<1.3	<1.3	<1.3	<0.63	<1.3	<1.3	<0.63	**1.3**	<0.63	<1.6	<0.088
DG-AV5	7.5-8	DG-AV5S-7.5-8	12/20/2018	<0.37	<3.7	<0.74	<0.74	<3.7	<0.37	<1.8	<0.37	<0.74	<0.37	<0.37	<0.37	<0.37	<0.74	<0.74	<0.74	<0.37	<0.74	<0.74	<0.37	<0.37	<0.37	<0.96	<0.052
DG-AV5	7.5-8	DG-AV5S-7.5-8	2/1/2019	<0.31	<3.1	<0.62	<0.62	<3.1	<0.31	<1.5	<0.31	<0.62	<0.31	<0.31	<0.31	<0.31	<0.62	<0.62	<0.62	<0.31	<0.62	<0.62	<0.31	<0.31	<0.31	<0.80	<0.043
DG-AV9	0.5-1	DG-AV9S-0.5-1	2/1/2019	<0.85	<8.5	<1.7	<1.7	<8.5	<0.85	<4.2	<0.85	<1.7	<0.85	<0.85	<0.85	<0.85	<1.7	<1.7	<1.7	<0.85	<1.7	<1.7	<0.85	<0.85	<0.85	<2.2	<0.12
DG-AV9	3.5-4	DG-AV9S-3.5-4	2/1/2019	<0.60	<6.0	<1.2	<1.2	<6.0	<0.60	<3.0	<0.60	<1.2	<0.60	<0.60	<0.60	<0.60	<1.2	<1.2	<1.2	<0.60	<1.2	<1.2	<0.60	<0.60	<0.60	<1.5	<0.083
DG-AV9	8.5-9	DG-AV9S-8.5-9	2/1/2019	<0.44	<4.4	<0.88	<0.88	<4.4	<0.44	<2.2	<0.44	<0.88	<0.44	<0.44	<0.44	<0.44	<0.88	<0.88	<0.88	<0.44	<0.88	<0.88	<0.44	<0.44	<0.44	<1.1	<0.062
DG-AW11	0.5-1	DG-AW11S-0.5-1	1/23/2019	<0.40	<4.0	<0.80	<0.80	**32**	<0.40	<2.0	<0.40	**1.7**	<0.40	<0.40	<0.40	<0.40	<0.80	<0.80	<0.80	<0.40	<0.80	<0.80	<0.40	<0.40	<0.40	<1.0	<0.056
DG-AW11	3.5-4	DG-AW11S-3.5-4	1/23/2019	<0.43	<4.3	<0.86	<0.86	**77**	<0.43	<2.2	<0.43	<0.86	<0.43	<0.43	<0.43	<0.43	<0.86	<0.86	<0.86	<0.43	<0.86	<0.86	<0.43	<0.43	<0.43	<1.1	<0.060
DG-AW11	7.5-8	DG-AW11S-7.5-8	1/23/2019	<0.41	<4.1	<0.83	<0.83	**75**	<0.41	<2.1	<0.41	**2**	<0.41	<0.41	<0.41	<0.41	<0.83	<0.83	<0.83	<0.41	<0.83	<0.83	<0.41	<0.41	<0.41	<1.1	<0.058
DG-AW3	0.5-1	DG-AW3S-0.5-1	1/31/2019	<0.51	<5.1	<1.0	<1.0	<5.1	<0.51	<2.6	<0.51	<1.0	<0.51	<0.51	<0.51	<0.51	<1.0	<1.0	<1.0	<0.51	<1.0	<1.0	<0.51	<0.51	<0.51	<1.3	<0.072
DG-AW3	3.5-4	DG-AW3S-3.5-4	1/31/2019	<0.38	<3.8	<0.75	<0.75	<3.8	<0.38	<1.9	<0.38	<0.75	<0.38	<0.38	<0.38	<0.38	<0.75	<0.75	<0.75	<0.38	<0.75	<0.75	<0.38	<0.38	<0.38	<0.98	<0.053
DG-AW7	0.5-1	DG-AW7S-0.5-1	1/11/2019	<0.40	<4.0	<0.79	<0.79	<4.0	<0.40	<2.0	**0.47**	<0.79	<0.40	<0.40	<0.40	<0.40	<0.79	<0.79	<0.79	<0.40	<0.79	<0.79	<0.40	<0.40	<0.40	<1.0	<0.055
DG-AW7	3.5-4	DG-AW7S-3.5-4	1/11/2019	<0.44	<4.4	<0.88	<0.88	<4.4	<0.44	<2.2	<0.44	<0.88	<0.44	<0.44	<0.44	<0.44	<0.88	<0.88	<0.88	<0.44	<0.88	<0.88	<0.44	<0.44	<0.44	<1.1	<0.062
DG-AX5	0.5-1	DG-AX5S-0.5-1	12/20/2018	<0.54	<5.4	<1.1	<1.1	<5.4	<0.54	<2.7	<0.54	<1.1	<0.54	<0.54	<0.54	<0.54	<1.1	<1.1	<1.1	<0.54	<1.1	<1.1	<0.54	<0.54	<0.54	<1.4	<0.076
DG-AX5	3.5-4	DG-AX5S-3.5-4	12/20/2018	<0.43	<4.3	<0.87	<0.87	<4.3	<0.43	<2.2	<0.43	<0.87	<0.43	<0.43	<0.43	<0.43	<0.87	**2.1**	<0.87	<0.43	<0.87	<0.87	<0.43	<0.43	<0.43	<1.1	<0.061
DG-AX9	0.5-1	DG-AX9S-0.5-1	1/23/2019	<0.34	<3.4	<0.68	<0.68	**10**	<0.34	<1.7	<0.34	<0.68	<0.34	<0.34	<0.34	<0.34	<0.68	<0.68	<0.68	<0.34	<0.68	<0.68	<0.34	<0.34	<0.34	<0.89	<0.048
DG-AX9	3.5-4	DG-AX9S-3.5-4	1/23/2019	<0.43	<4.3	<0.85	<0.85	**7.5**	<0.43	<2.1	<0.43	<0.85	<0.43	<0.43	<0.43	<0.43	<0.85	<0.85	<0.85	<0.43	<0.85	<0.85	<0.43	<0.43	<0.43	<1.1	<0.060
DG-AX9	9.5-10	DG-AX9S-9.5-10	1/23/2019	<0.47	<4.7	<0.93	<0.93	<4.7	<0.47	<2.3	<0.47	<0.93	<0.47	<0.47	<0.47	<0.47	<0.93	<0.93	<0.93	<0.47	<0.93	<0.93	<0.47	<0.47	<0.47	<1.2	<0.065
DG-AY3	0.5-1	DG-AY3S-0.5-1	1/31/2019	<0.44	<4.4	<0.88	<0.88	<4.4	<0.44	<2.2	<0.44	<0.88	<0.44	<0.44	<0.44	<0.44	<0.88	<0.88	<0.88	<0.44	<0.88	<0.88	<0.44	<0.44	<0.44	<1.1	<0.062
DG-AY3	3.5-4	DG-AY3S-3.5-4	1/31/2019	<0.36	<3.6	<0.72	<0.72	<3.6	<0.36	<1.8	<0.36	<0.72	<0.36	<0.36	<0.36	<0.36	<0.72	<0.72	<0.72	<0.36	<0.72	<0.72	<0.36	<0.36	<0.36	<0.94	<0.051
DG-N1	0.5-1	DG-N1S-0.5-1	12/18/2018	<0.44	<4.4	<0.89	<0.89	<4.4	<0.44	<2.2	<0.44	<0.89	<0.44	<0.44	<0.44	<0.44	<0.89	<0.89	<0.89	<0.44	<0.89	<0.89	<0.44	<0.44	<0.44	<1.2	<0.062
DG-N1	3.5-4	DG-N1S-3.5-4	12/18/2018	<0.47	<4.7	<0.94	<0.94	<4.7	<0.47	<2.3	<0.47	<0.94	<0.47	<0.47	<0.47	<0.47	<0.94	<0.94	<0.94	<0.47	<0.94	<0.94	<0.47	<0.47	<0.47	<1.2	<0.066
DG-N13	0.5-1	DG-N13S-0.5-1	1/10/2019	<0.38	<3.8	<0.76	<0.76	<3.8	<0.38	<1.9	<0.38	<0.76	<0.38	<0.38	<0.38	<0.38	<0.76	<0.76	<0.76	<0.38	<0.76	<0.76	<0.38	<0.38	<0.38	<0.99	<0.053
DG-N13 (D)	0.5-1	DG-N13 (D)S-0.5-1	1/10/2019	<0.62	<6.2	<1.2	<1.2	<6.2	<0.62	<3.1	<0.62	<1.2	<0.62	<0.62	<0.62	<0.62	<1.2	<1.2	<1.2	<0.62	<1.2	<1.2	<0.62	<0.62	<0.62	<1.6	<0.086
DG-N13	3.5-4	DG-N13S-3.5-4	1/10/2019	<0.65	<6.5	<1.3	<1.3	<6.5	<0.65	<3.2	<0.65	<1.3	<0.65	<0.65	<0.65	<0.65	<1.3	<1.3	<1.3	<0.65	<1.3	<1.3	<0.65	<0.65	<0.65	<1.7	<0.091
DG-N13	7.5-8	DG-N13S-7.5-8	1/10/2019	<0.59	<5.9	<1.2	<1.2	<5.9	<0.59	<3.0	<0.59	<1.2	<0.59	<0.59	<0.59	<0.59	<1.2	<1.2	<1.2	<0.59	<1.2	<1.2	<0.59	<0.59	<0.59	<1.5	<0.083
DG-N4	4.5-5	DG-N4S-4.5-5	12/19/2018	<35	<140	<35	<35	<350	<35	<140	<35	<87	<35	<35	<35	<35	<70	**84**	<70	**35**	<35	<70	<35	<35	<35	<70	**39**
DG-N4	8.5-9	DG-N4S-8.5-9	12/19/2018	<0.29	<2.9	<0.57	<0.57	<2.9	<0.29	<1.4	<0.29	<0.57	<0.29	<0.29	<0.29	<0.29	<0.57	<0.57	<0.57	<0.29	<0.57	<0.57	<0.29	<0.29	<0.29	<0.74	**0.7**
DG-N5	0.5-1	DG-N5S-0.5-1	1/8/2019	<0.67	<6.7	<1.3	<1.3	<6.7	<0.67	<3.4	<0.67	<1.3	<0.67	<0.67	<0.67	<0.67	<1.3	<1.3	<1.3	<0.67	<1.3	<1.3	<0.67	<0.67	<0.67	<1.7	<0.094
DG-N5 (D)	0.5-1	DG-N5 (D)S-0.5-1	1/8/2019	<0.32	<3.2	<0.64	<0.64	<3.2	<0.32	<1.6	<0.32	<0.64	<0.32	<0.32	<0.32	<0.32	<0.64	<0.64	<0.64	<0.32	<0.64	<0.64	<0.32	<0.32	<0.32	<0.84	<0.045

Table 5: Volatile Organic Compounds and Total Petroleum Hydrocarbons as Gasoline Concentrations in Soil
UPC OU-2
Brisbane, California

Sample Location	Depth Range (ft bgs)	Sample Name	Collection Date	1,1,1-Trichloroethane	1,1,2-Trichloro-1,2,2-trifluoroethane	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	2-Butanone	4-Isopropyltoluene	4-Methyl-2-pentanone	Benzene	Carbon disulfide	Chloroform	cis-1,2-Dichloroethene	Ethylbenzene	Isopropylbenzene	Methyl-tert-butyl ether (MTBE)	Naphthalene	n-Butylbenzene	n-Propylbenzene	sec-Butylbenzene	tert-Butylbenzene	Tetrachloroethene (PCE)	Toluene	Trichloroethene (TCE)	Xylenes, Total	TPH-Gasoline (C4-C12)
Direct Exposure Human Health Risk Level Residential Soil Exposure ESL [1]				1.7E+06	--	--	--	--	--	--	3.3E+02	--	3.2E+02	1.9E+04	5.9E+03	--	4.7E+04	3.8E+03	--	--	--	--	5.9E+02	1.1E+06	9.5E+02	5.8E+05	4.3E+05
Leaching to Groundwater Levels Non-drinking Water ESL [2]				7.0E+03	--	--	--	--	--	--	2.5E+01	--	2.3E+01	1.6E+03	4.3E+02	--	2.5E+03	1.2E+03	--	--	--	--	8.0E+01	1.0E+04	8.5E+01	1.0E+04	4.9E+03
EPA RSL for Resident Soil [3]				8.1E+06	6.7E+06	3.0E+05	2.7E+05	2.7E+07	--	3.3E+07	1.2E+03	7.7E+05	3.2E+02	1.6E+05	5.8E+03	1.9E+06	4.7E+04	3.8E+03	3.9E+06	3.8E+06	7.8E+06	7.8E+06	2.4E+04	4.9E+06	9.4E+02	5.8E+05	--
Units				µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	mg/kg
DG-N5 (D)	0.5-1	DG-N5 (D)S-0.5-1	1/24/2019	<0.37	<3.7	<0.73	<0.73	<3.7	<0.37	<1.8	<0.37	<0.73	<0.37	<0.37	<0.37	<0.37	<0.73	<0.73	<0.73	<0.37	<0.73	<0.73	<0.37	<0.37	<0.37	<0.95	**0.47**
DG-N5	3.5-4	DG-N5S-3.5-4	1/8/2019	<0.29	<2.9	<0.59	<0.59	<2.9	<0.29	<1.5	<0.29	<0.59	<0.29	<0.29	<0.29	<0.29	<0.59	<0.59	<0.59	<0.29	<0.59	<0.59	<0.29	<0.29	<0.29	<0.77	<0.041
DG-N9	0.5-1	DG-N9S-0.5-1	1/10/2019	<0.38	<3.8	<0.76	<0.76	<3.8	<0.38	<1.9	<0.38	<0.76	<0.38	<0.38	<0.38	<0.38	<0.76	<0.76	<0.76	<0.38	<0.76	<0.76	<0.38	<0.38	<0.38	<0.99	<0.053
DG-N9	3.5-4	DG-N9S-3.5-4	1/10/2019	<0.35	<3.5	<0.71	<0.71	<3.5	<0.35	<1.8	<0.35	<0.71	<0.35	<0.35	<0.35	<0.35	<0.71	<0.71	<0.71	<0.35	<0.71	<0.71	<0.35	<0.35	<0.35	<0.92	<0.050
DG-O11	0.5-1	DG-O11S-0.5-1	1/10/2019	<0.54	<5.4	<1.1	<1.1	<5.4	<0.54	<2.7	<0.54	<1.1	<0.54	<0.54	<0.54	<0.54	<1.1	<1.1	<1.1	<0.54	<1.1	<1.1	<0.54	<0.54	<0.54	<1.4	<0.075
DG-O11	3.5-4	DG-O11S-3.5-4	1/10/2019	<0.39	<3.9	<0.78	<0.78	<3.9	<0.39	<2.0	<0.39	<0.78	<0.39	<0.39	<0.39	<0.39	<0.78	<0.78	<0.78	<0.39	<0.78	<0.78	<0.39	<0.39	<0.39	<1.0	<0.055
DG-O15	0.5-1	DG-O15S-0.5-1	1/10/2019	<0.72	<7.2	<1.4	<1.4	<7.2	<0.72	<3.6	<0.72	<1.4	<0.72	<0.72	<0.72	<0.72	<1.4	<1.4	<1.4	<0.72	<1.4	<1.4	<0.72	<0.72	<0.72	<1.9	<0.10
DG-O15	3.5-4	DG-O15S-3.5-4	1/10/2019	<0.33	<3.3	<0.66	<0.66	**10**	<0.33	<1.7	<0.33	<0.66	<0.33	<0.33	<0.33	<0.33	<0.66	<0.66	<0.66	<0.33	<0.66	<0.66	<0.33	<0.33	<0.33	<0.86	<0.046
DG-O15 (D)	3.5-4	DG-O15 (D)S-3.5-4	1/10/2019	<0.34	<3.4	<0.69	<0.69	<3.4	<0.34	<1.7	<0.34	<0.69	<0.34	<0.34	<0.34	<0.34	<0.69	<0.69	<0.69	<0.34	<0.69	<0.69	<0.34	<0.34	<0.34	<0.90	<0.048
DG-O15	7.5-8	DG-O15S-7.5-8	1/10/2019	<0.32	<3.2	<0.65	<0.65	<3.2	<0.32	<1.6	<0.32	<0.65	<0.32	<0.32	<0.32	<0.32	<0.65	<0.65	<0.65	<0.32	<0.65	<0.65	<0.32	<0.32	<0.32	<0.84	<0.045
DG-O3	0.5-1	DG-O3S-0.5-1	12/18/2018	<0.43	<4.3	<0.87	<0.87	<4.3	<0.43	<2.2	<0.43	<0.87	<0.43	<0.43	<0.43	<0.43	<0.87	<0.87	<0.87	<0.43	<0.87	<0.87	<0.43	<0.43	<0.43	<1.1	<0.061
DG-O3	3.5-4	DG-O3S-3.5-4	12/18/2018	<0.44	<4.4	<0.88	<0.88	<4.4	<0.44	<2.2	<0.44	<0.88	<0.44	<0.44	<0.44	<0.44	<0.88	<0.88	<0.88	<0.44	<0.88	<0.88	<0.44	<0.44	<0.44	<1.1	<0.062
DG-O4	4.5-5	DG-O4S-4.5-5	12/19/2018	<210	<830	<210	<210	<2,100	<210	<830	<210	<520	<210	<210	<210	<210	<410	<410	<410	<210	<210	<410	<210	<210	<210	<410	**210**
DG-O4	7.5-8	DG-O4S-7.5-8	2/4/2019	<0.31	<3.1	<0.62	<0.62	<3.1	<0.31	<1.6	<0.31	<0.62	<0.31	<0.31	<0.31	<0.31	<0.62	<0.62	<0.62	<0.31	<0.62	<0.62	<0.31	<0.31	<0.31	<0.81	**0.31**
DG-O4	9.5-10	DG-O4S-9.5-10	12/19/2018	<0.30	<3.0	<0.60	<0.60	<3.0	<0.30	<1.5	<0.30	**1.5**	<0.30	<0.30	<0.30	<0.30	<0.60	<0.60	<0.60	<0.30	<0.60	<0.60	<0.30	<0.30	<0.30	<0.78	**0.94**
DG-O7	0.5-1	DG-O7S-0.5-1	1/8/2019	<0.54	<5.4	<1.1	<1.1	<5.4	<0.54	<2.7	<0.54	<1.1	<0.54	<0.54	<0.54	<0.54	<1.1	<1.1	<1.1	<0.54	<1.1	<1.1	<0.54	<0.54	<0.54	<1.4	<0.075
DG-O7	3.5-4	DG-O7S-3.5-4	1/8/2019	<0.32	<3.2	<0.64	<0.64	<3.2	<0.32	<1.6	<0.32	<0.64	<0.32	<0.32	<0.32	<0.32	<0.64	<0.64	<0.64	<0.32	<0.64	<0.64	<0.32	<0.32	<0.32	<0.83	<0.045
DG-P1	0.5-1	DG-P1S-0.5-1	12/18/2018	<0.42	<4.2	<0.83	<0.83	<4.2	<0.42	<2.1	<0.42	<0.83	<0.42	<0.42	<0.42	<0.42	<0.83	<0.83	<0.83	<0.42	<0.83	<0.83	<0.42	<0.42	<0.42	<1.1	<0.058
DG-P1 (D)	0.5-1	DG-P1 (D)S-0.5-1	12/18/2018	<0.36	<3.6	<0.72	<0.72	<3.6	<0.36	<1.8	<0.36	<0.72	<0.36	<0.36	<0.36	<0.36	<0.72	<0.72	<0.72	<0.36	<0.72	<0.72	<0.36	<0.36	<0.36	<0.94	<0.051
DG-P1	3.5-4	DG-P1S-3.5-4	12/18/2018	<0.42	<4.2	<0.84	<0.84	<4.2	<0.42	<2.1	<0.42	<0.84	<0.42	<0.42	<0.42	<0.42	<0.84	<0.84	<0.84	<0.42	<0.84	<0.84	<0.42	<0.42	<0.42	<1.1	<0.059
DG-P13	0.5-1	DG-P13S-0.5-1	1/10/2019	<0.45	<4.5	<0.91	<0.91	<4.5	<0.45	<2.3	<0.45	<0.91	<0.45	<0.45	<0.45	<0.45	<0.91	<0.91	<0.91	<0.45	<0.91	<0.91	<0.45	<0.45	<0.45	<1.2	<0.064
DG-P13	3.5-4	DG-P13S-3.5-4	1/10/2019	<0.30	<3.0	<0.60	<0.60	<3.0	<0.30	<1.5	<0.30	<0.60	<0.30	<0.30	<0.30	<0.30	<0.60	<0.60	<0.60	<0.30	<0.60	<0.60	<0.30	<0.30	<0.30	<0.78	<0.042
DG-P13 (D)	3.5-4	DG-P13 (D)S-3.5-4	1/10/2019	<0.30	<3.0	<0.59	<0.59	<3.0	<0.30	<1.5	<0.30	<0.59	<0.30	<0.30	<0.30	<0.30	<0.59	<0.59	<0.59	<0.30	<0.59	<0.59	<0.30	<0.30	<0.30	<0.77	<0.042
DG-P4	4.5-5	DG-P4S-4.5-5	12/19/2018	<270	<1,100	<270	<270	<2,700	<270	<1,100	<270	<680	<270	<270	<270	<270	<540	<540	<540	<270	<270	<540	<270	<270	<270	<540	**260**
DG-P4	7.5-8	DG-P4S-7.5-8	12/19/2018	<37	<150	<37	<37	<370	<37	<150	<37	<91	<37	<37	<37	<37	<73	<73	<73	<37	<37	<73	<37	<37	<37	<73	**20**
DG-P5	0.5-1	DG-P5S-0.5-1	1/8/2019	<0.36	<3.6	<0.71	<0.71	<3.6	<0.36	<1.8	<0.36	<0.71	<0.36	<0.36	<0.36	<0.36	<0.71	<0.71	<0.71	<0.36	<0.71	<0.71	<0.36	<0.36	<0.36	<0.93	<0.050
DG-P5	3.5-4	DG-P5S-3.5-4	1/8/2019	<0.41	<4.1	<0.81	<0.81	<4.1	<0.41	<2.0	<0.41	<0.81	<0.41	<0.41	<0.41	<0.41	<0.81	<0.81	<0.81	<0.41	<0.81	<0.81	<0.41	<0.41	<0.41	<1.1	<0.057
DG-P9	0.5-1	DG-P9S-0.5-1	1/10/2019	<0.32	<3.2	<0.63	<0.63	<3.2	<0.32	<1.6	<0.32	<0.63	<0.32	<0.32	<0.32	<0.32	<0.63	<0.63	<0.63	<0.32	<0.63	<0.63	<0.32	<0.32	<0.32	<0.82	<0.044
DG-P9	3.5-4	DG-P9S-3.5-4	1/10/2019	<0.34	<3.4	<0.69	<0.69	<3.4	<0.34	<1.7	<0.34	<0.69	<0.34	<0.34	<0.34	<0.34	<0.69	<0.69	<0.69	<0.34	<0.69	<0.69	<0.34	<0.34	<0.34	<0.89	<0.048
DG-Q11	0.5-1	DG-Q11S-0.5-1	1/10/2019	<0.39	<3.9	<0.79	<0.79	<3.9	<0.39	<2.0	<0.39	<0.79	<0.39	<0.39	<0.39	<0.39	<0.79	<0.79	<0.79	<0.39	<0.79	<0.79	<0.39	<0.39	<0.39	<1.0	<0.055
DG-Q11 (D)	0.5-1	DG-Q11 (D)S-0.5-1	1/10/2019	<0.38	<3.8	<0.77	<0.77	<3.8	<0.38	<1.9	<0.38	<0.77	<0.38	<0.38	<0.38	<0.38	<0.77	<0.77	<0.77	<0.38	<0.77	<0.77	<0.38	<0.38	<0.38	<1.0	<0.054
DG-Q11	3.5-4	DG-Q11S-3.5-4	1/10/2019	<0.36	<3.6	<0.72	<0.72	<3.6	<0.36	<1.8	<0.36	<0.72	<0.36	<0.36	<0.36	<0.36	<0.72	<0.72	<0.72	<0.36	<0.72	<0.72	<0.36	<0.36	<0.36	<0.94	<0.050
DG-Q15	0.5-1	DG-Q15S-0.5-1	1/11/2019	<0.48	<4.8	<0.97	<0.97	<4.8	<0.48	<2.4	**0.54**	<0.97	<0.48	<0.48	<0.48	<0.48	<0.97	<0.97	<0.97	<0.48	<0.97	<0.97	<0.48	<0.48	<0.48	<1.3	<0.068
DG-Q15 (D)	0.5-1	DG-Q15 (D)S-0.5-1	1/11/2019	<0.48	<4.8	<0.97	<0.97	<4.8	<0.48	<2.4	**1.9**	<0.97	<0.48	<0.48	<0.48	<0.48	<0.97	<0.97	<0.97	<0.48	<0.97	<0.97	<0.48	**1**	<0.48	<1.3	<0.068
DG-Q15	3.5-4	DG-Q15S-3.5-4	1/11/2019	<0.35	<3.5	<0.70	<0.70	<3.5	<0.35	<1.7	<0.35	<0.70	<0.35	<0.35	<0.35	<0.35	<0.70	<0.70	<0.70	<0.35	<0.70	<0.70	<0.35	<0.35	<0.35	<0.91	<0.049
DG-Q15	7.5-8	DG-Q15S-7.5-8	1/11/2019	<0.30	<3.0	<0.60	<0.60	<3.0	<0.30	<1.5	**0.79**	<0.60	<0.30	<0.30	<0.30	<0.30	<0.60	<0.60	<0.60	<0.30	<0.60	<0.60	<0.30	**1.5**	<0.30	<0.78	<0.042
DG-Q3	0.5-1	DG-Q3S-0.5-1	12/18/2018	<0.37	<3.7	<0.74	<0.74	<3.7	<0.37	<1.8	<0.37	<0.74	<0.37	<0.37	<0.37	<0.37	<0.74	<0.74	<0.74	<0.37	<0.74	<0.74	<0.37	<0.37	<0.37	<0.96	<0.052
DG-Q3	3.5-4	DG-Q3S-3.5-4	12/18/2018	<0.35	<3.5	<0.69	<0.69	<3.5	<0.35	<1.7	<0.35	<0.69	<0.35	<0.35	<0.35	<0.35	<0.69	<0.69	<0.69	<0.35	<0.69	<0.69	<0.35	<0.35	<0.35	<0.90	<0.048
DG-Q7	0.5-1	DG-Q7S-0.5-1	1/8/2019	<0.39	<3.9	<0.78	<0.78	<3.9	<0.39	<2.0	<0.39	<0.78	<0.39	<0.39	<0.39	<0.39	<0.78	<0.78	<0.78	<0.39	<0.78	<0.78	<0.39	<0.39	<0.39	<1.0	<0.055
DG-Q7	3.5-4	DG-Q7S-3.5-4	1/8/2019	<0.37	<3.7	<0.75	<0.75	<3.7	<0.37	<1.9	<0.37	<0.75	<0.37	<0.37	<0.37	<0.37	<0.75	<0.75	<0.75	<0.37	<0.75	<0.75	<0.37	<0.37	<0.37	<0.97	<0.052
DG-Q7 (D)	3.5-4	DG-Q7 (D)S-3.5-4	1/8/2019	<0.36	<3.6	<0.72	<0.72	<3.6	<0.36	<1.8	<0.36	<0.72	<0.36	<0.36	<0.36	<0.36	<0.72	<0.72	<0.72	<0.36	<0.72	<0.72	<0.36	<0.36	<0.36	<0.93	<0.050
DG-R1	0.5-1	DG-R1S-0.5-1	12/17/2018	<0.36	<3.6	<0.72	<0.72	<3.6	<0.36	<1.8	<0.36	<0.72	<0.36	<0.36	<0.36	<0.36	<0.72	<0.72	<0.72	<0.36	<0.72	<0.72	<0.36	<0.36	<0.36	<0.93	<0.050
DG-R1	3.5-4	DG-R1S-3.5-4	12/17/2018	<0.46	<4.6	<0.92	<0.92	<4.6	<0.46	<2.3	<0.46	<0.92	<0.46	<0.46	<0.46	<0.46	<0.92	<0.92	<0.92	<0.46	<0.92	<0.92	<0.46	<0.46	<0.46	<1.2	<0.064
DG-R13	0.5-1	DG-R13S-0.5-1	1/28/2019	<88	<350	**310**	**350**	<880	<88	<350	**2300**	<220	<88	<88	**210**	<88	<180	**830**	<180	<88	<88	<180	<88	**4200**	<88	**4300**	**30**
DG-R13	3.5-4	DG-R13S-3.5-4	1/28/2019	<0.43	<4.3	<0.86	<0.86	<4.3	<0.43	<2.2	**1.3**	<0.86	<0.43	<0.43	<0.43	<0.43	<0.86	<0.86	<0.86	<0.43	<0.86	<0.86	<0.43	**0.67**	<0.43	<1.1	<0.060
DG-R15	3.5-4	DG-R15S-3.5-4	12/21/2018	<160	<650	**11000**	**6000**	<1,600	**2000**	<650	<160	<410	<160	<160	<160	**970**	<320	**2900**	**1700**	**1600**	**1600**	<320	<160	<160	<160	**2200**	**1300**

Table 5: Volatile Organic Compounds and Total Petroleum Hydrocarbons as Gasoline Concentrations in Soil
UPC OU-2
Brisbane, California

Sample Location	Depth Range (ft bgs)	Sample Name	Collection Date	1,1,1-Trichloroethane	1,1,2-Trichloro-1,2,2-trifluoroethane	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	2-Butanone	4-Isopropyltoluene	4-Methyl-2-pentanone	Benzene	Carbon disulfide	Chloroform	cis-1,2-Dichloroethene	Ethylbenzene	Isopropylbenzene	Methyl-tert-butyl ether (MTBE)	Naphthalene	n-Butylbenzene	n-Propylbenzene	sec-Butylbenzene	tert-Butylbenzene	Tetrachloroethene (PCE)	Toluene	Trichloroethene (TCE)	Xylenes, Total	TPH-Gasoline (C4-C12)
Direct Exposure Human Health Risk Level Residential Soil Exposure ESL [1]				1.7E+06	--	--	--	--	--	--	3.3E+02	--	3.2E+02	1.9E+04	5.9E+03	--	4.7E+04	3.8E+03	--	--	--	--	5.9E+02	1.1E+06	9.5E+02	5.8E+05	4.3E+05
Leaching to Groundwater Levels Non-drinking Water ESL [2]				7.0E+03	--	--	--	--	--	--	2.5E+01	--	2.3E+01	1.6E+03	4.3E+02	--	2.5E+03	1.2E+03	--	--	--	--	8.0E+01	1.0E+04	8.5E+01	1.0E+04	4.9E+03
EPA RSL for Resident Soil [3]				8.1E+06	6.7E+06	3.0E+05	2.7E+05	2.7E+07	--	3.3E+07	1.2E+03	7.7E+05	3.2E+02	1.6E+05	5.8E+03	1.9E+06	4.7E+04	3.8E+03	3.9E+06	3.8E+06	7.8E+06	7.8E+06	2.4E+04	4.9E+06	9.4E+02	5.8E+05	--
Units				µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	mg/kg
DG-R15	3.5-4	DG-R15S-3.5-4	2/5/2019	<0.34	<3.4	<0.69	<0.69	<3.4	<0.34	<1.7	<0.34	<0.69	<0.34	<0.34	<0.34	<0.34	<0.69	<0.69	<0.69	<0.34	<0.69	<0.69	<0.34	<0.34	<0.34	<0.90	<0.048
DG-R5	0.5-1	DG-R5S-0.5-1	1/29/2019	<0.45	<4.5	<0.90	<0.90	<4.5	<0.45	<2.2	<0.45	<0.90	<0.45	<0.45	<0.45	<0.45	<0.90	<0.90	<0.90	<0.45	<0.90	<0.90	<0.45	<0.45	<0.45	<1.2	<0.063
DG-R5	3.5-4	DG-R5S-3.5-4	1/29/2019	<0.38	<3.8	<0.76	<0.76	<3.8	<0.38	<1.9	<0.38	<0.76	<0.38	<0.38	<0.38	<0.38	<0.76	<0.76	<0.76	<0.38	<0.76	<0.76	<0.38	<0.38	<0.38	<0.99	<0.054
DG-R5 (D)	3.5-4	DG-R5 (D)S-3.5-4	1/29/2019	<0.37	<3.7	<0.73	<0.73	<3.7	<0.37	<1.8	<0.37	<0.73	<0.37	<0.37	<0.37	<0.37	<0.73	<0.73	<0.73	<0.37	<0.73	<0.73	<0.37	<0.37	<0.37	<0.95	<0.051
DG-R9	0.5-1	DG-R9S-0.5-1	1/22/2019	<0.50	<5.0	<1.0	<1.0	<5.0	<0.50	<2.5	<0.50	<1.0	<0.50	<0.50	<0.50	<0.50	<1.0	<1.0	<1.0	<0.50	<1.0	<1.0	<0.50	<0.50	<0.50	<1.3	<0.070
DG-R9	3.5-4	DG-R9S-3.5-4	1/22/2019	<0.43	<4.3	<0.85	<0.85	<4.3	<0.43	<2.1	<0.43	<0.85	<0.43	<0.43	<0.43	<0.43	<0.85	<0.85	<0.85	<0.43	<0.85	<0.85	<0.43	<0.43	<0.43	<1.1	<0.060
DG-S11	0.5-1	DG-S11S-0.5-1	1/10/2019	<0.41	<4.1	<0.81	<0.81	<4.1	<0.41	<2.0	<0.41	<0.81	<0.41	<0.41	<0.41	<0.41	<0.81	<0.81	<0.81	<0.41	<0.81	<0.81	<0.41	<0.41	<0.41	<1.1	<0.057
DG-S11	3.5-4	DG-S11S-3.5-4	1/10/2019	<0.47	<4.7	<0.95	<0.95	<4.7	<0.47	<2.4	<0.47	<0.95	<0.47	<0.47	<0.47	<0.47	<0.95	<0.95	<0.95	<0.47	<0.95	<0.95	**1.2**	<0.47	<0.47	<1.2	<0.066
DG-S15	0.5-1	DG-S15S-0.5-1	1/11/2019	<0.39	<3.9	<0.78	<0.78	<3.9	<0.39	<2.0	<0.39	<0.78	<0.39	<0.39	<0.39	<0.39	<0.78	<0.78	<0.78	<0.39	<0.78	<0.78	**0.67**	<0.39	<0.39	<1.0	<0.055
DG-S15	3.5-4	DG-S15S-3.5-4	1/11/2019	<0.32	<3.2	<0.64	<0.64	<3.2	<0.32	<1.6	<0.32	<0.64	<0.32	<0.32	<0.32	<0.32	<0.64	<0.64	<0.64	<0.32	<0.64	<0.64	**6.2**	<0.32	**3.5**	<0.83	<0.044
DG-S15 (D)	3.5-4	DG-S15 (D)S-3.5-4	1/11/2019	<0.35	<3.5	<0.71	<0.71	<3.5	<0.35	<1.8	<0.35	<0.71	<0.35	<0.35	<0.35	<0.35	<0.71	<0.71	<0.71	<0.35	<0.71	<0.71	**3.3**	<0.35	**2.7**	<0.92	<0.049
DG-S15	6-6.5	DG-S15S-6-6.5	1/11/2019	<0.39	<3.9	<0.78	<0.78	<3.9	<0.39	<1.9	<0.39	<0.78	<0.39	<0.39	<0.39	<0.39	<0.78	<0.78	<0.78	<0.39	<0.78	<0.78	<0.39	<0.39	**0.43**	<1.0	**3.2**
DG-S3	0.5-1	DG-S3S-0.5-1	12/18/2018	<0.40	<4.0	<0.79	<0.79	<4.0	<0.40	<2.0	<0.40	<0.79	<0.40	<0.40	<0.40	<0.40	<0.79	<0.79	<0.79	<0.40	<0.79	<0.79	<0.40	<0.40	<0.40	<1.0	<0.056
DG-S3	3.5-4	DG-S3S-3.5-4	12/18/2018	<0.44	<4.4	<0.87	<0.87	<4.4	<0.44	<2.2	<0.44	<0.87	<0.44	<0.44	<0.44	<0.44	<0.87	<0.87	<0.87	<0.44	<0.87	<0.87	<0.44	<0.44	<0.44	<1.1	<0.068
DG-S7	0.5-1	DG-S7S-0.5-1	1/8/2019	<0.36	<3.6	<0.73	<0.73	<3.6	<0.36	<1.8	<0.36	<0.73	<0.36	<0.36	<0.36	<0.36	<0.73	<0.73	<0.73	<0.36	<0.73	<0.73	<0.36	<0.36	<0.36	<0.95	<0.051
DG-S7	3.5-4	DG-S7S-3.5-4	1/8/2019	<0.35	<3.5	<0.70	<0.70	<3.5	<0.35	<1.8	<0.35	<0.70	<0.35	<0.35	<0.35	<0.35	<0.70	<0.70	<0.70	<0.35	<0.70	<0.70	<0.35	<0.35	<0.35	<0.92	<0.049
DG-S7	3.5-4	DG-S7S-3.5-4	2/4/2019	<0.42	<4.2	<0.84	<0.84	<4.2	<0.42	<2.1	<0.42	<0.84	<0.42	<0.42	<0.42	<0.42	<0.84	<0.84	<0.84	<0.42	<0.84	<0.84	<0.42	<0.42	<0.42	<1.1	<0.059
DG-S9	4.5-5	DG-S9S-4.5-5	12/20/2018	<0.26	<2.6	<0.53	<0.53	**22**	<0.26	<1.3	<0.26	<0.53	<0.26	<0.26	<0.26	<0.26	<0.53	<0.53	<0.53	<0.26	<0.53	<0.53	<0.26	<0.26	<0.26	<0.68	**0.061**
DG-S9	4.5-5	DG-S9S-4.5-5	2/4/2019	<0.40	<4.0	<0.80	<0.80	**22**	<0.40	<2.0	<0.40	<0.80	<0.40	<0.40	<0.40	<0.40	<0.80	<0.80	<0.80	<0.40	<0.80	<0.80	<0.40	**0.45**	<0.40	<1.0	<0.056
DG-S9	7-7.5	DG-S9S-7-7.5	2/4/2019	<0.31	<3.1	<0.63	<0.63	<3.1	<0.31	<1.6	<0.31	<0.63	<0.31	<0.31	<0.31	<0.31	<0.63	<0.63	<0.63	<0.31	<0.63	<0.63	<0.31	**0.49**	<0.31	<0.82	**0.16**
DG-S9	7.5-8	DG-S9S-7.5-8	12/20/2018	<0.18	<1.8	<0.36	<0.36	**10**	<0.18	<0.90	<0.18	<0.36	<0.18	<0.18	<0.18	<0.18	<0.36	<0.36	<0.36	<0.18	<0.36	<0.36	<0.18	<0.18	<0.18	<0.47	**0.37**
DG-T1	0.5-1	DG-T1S-0.5-1	12/17/2018	<0.44	<4.4	<0.89	<0.89	<4.4	<0.44	<2.2	<0.44	<0.89	<0.44	<0.44	<0.44	<0.44	<0.89	<0.89	<0.89	<0.44	<0.89	<0.89	<0.44	<0.44	<0.44	<1.2	<0.062
DG-T1	3.5-4	DG-T1S-3.5-4	12/17/2018	<0.53	<5.3	<1.1	<1.1	<5.3	<0.53	<2.7	<0.53	<1.1	<0.53	<0.53	<0.53	<0.53	<1.1	<1.1	<1.1	<0.53	<1.1	<1.1	<0.53	<0.53	<0.53	<1.4	<0.075
DG-T1 (D)	3.5-4	DG-T1 (D)S-3.5-4	12/17/2018	<0.95	<9.5	<1.9	<1.9	<9.5	<0.95	<4.8	<0.95	<1.9	<0.95	<0.95	<0.95	<0.95	<1.9	<1.9	<1.9	<0.95	<1.9	<1.9	<0.95	<0.95	<0.95	<2.5	<0.13
DG-T13	0.5-1	DG-T13S-0.5-1	1/10/2019	<0.33	<3.3	<0.66	<0.66	<3.3	<0.33	<1.7	<0.33	<0.66	<0.33	<0.33	<0.33	<0.33	<0.66	<0.66	<0.66	<0.33	<0.66	<0.66	<0.33	<0.33	<0.33	<0.86	<0.046
DG-T13 (D)	0.5-1	DG-T13 (D)S-0.5-1	1/10/2019	<0.39	<3.9	<0.78	<0.78	<3.9	<0.39	<1.9	<0.39	<0.78	<0.39	<0.39	<0.39	<0.39	<0.78	<0.78	<0.78	<0.39	<0.78	<0.78	<0.39	<0.39	<0.39	<1.0	<0.055
DG-T13	3.5-4	DG-T13S-3.5-4	1/10/2019	<0.34	<3.4	<0.68	<0.68	<3.4	<0.34	<1.7	<0.34	<0.68	<0.34	<0.34	<0.34	<0.34	<0.68	<0.68	<0.68	<0.34	<0.68	<0.68	<0.34	<0.34	<0.34	<0.88	<0.047
DG-T17	0.5-1	DG-T17S-0.5-1	1/28/2019	<49	<200	**450**	**99**	<490	**720**	<200	**450**	<120	<49	<49	**280**	**62**	<98	**260**	<98	**56**	<49	<98	<49	**1600**	<49	**1700**	**28**
DG-T17	3.5-4	DG-T17S-3.5-4	1/28/2019	<0.42	<4.2	<0.84	<0.84	<4.2	<0.42	<2.1	<0.42	<0.84	<0.42	<0.42	<0.42	<0.42	<0.84	<0.84	<0.84	<0.42	<0.84	<0.84	<0.42	<0.42	<0.42	<1.1	<0.059
DG-T17	7-7.5	DG-T17S-7-7.5	1/28/2019	<0.50	<5.0	<1.0	<1.0	**19**	<0.50	<2.5	<0.50	<1.0	<0.50	<0.50	<0.50	<0.50	<1.0	<1.0	<1.0	<0.50	<1.0	<1.0	<0.50	<0.50	<0.50	<1.3	<0.067
DG-T17 (D)	7-7.5	DG-T17 (D)S-7-7.5	1/28/2019	<0.52	<5.2	<1.0	<1.0	**18**	<0.52	<2.6	<0.52	<1.0	<0.52	<0.52	<0.52	<0.52	<1.0	<1.0	<1.0	<0.52	<1.0	<1.0	<0.52	<0.52	<0.52	<1.3	**0.19**
DG-T5	0.5-1	DG-T5S-0.5-1	1/8/2019	<0.44	<4.4	<0.87	<0.87	<4.4	<0.44	<2.2	<0.44	<0.87	<0.44	<0.44	<0.44	<0.44	<0.87	<0.75	<0.87	<0.44	<0.87	<0.87	<0.44	<0.44	<0.44	<1.1	<0.061
DG-T5	3.5-4	DG-T5S-3.5-4	1/8/2019	<0.33	<3.3	<0.66	<0.66	<3.3	<0.33	<1.7	<0.33	<0.66	<0.33	<0.33	<0.33	<0.33	<0.66	<0.66	<0.66	<0.33	<0.66	<0.66	<0.33	<0.33	<0.33	<0.86	<0.046
DG-T9	0.5-1	DG-T9S-0.5-1	1/10/2019	<0.46	<4.6	<0.92	<0.92	<4.6	<0.46	<2.3	<0.46	<0.92	<0.46	<0.46	<0.46	<0.46	<0.92	<0.92	<0.92	<0.46	<0.92	<0.92	<0.46	<0.46	<0.46	<1.2	<0.064
DG-T9	3.5-4	DG-T9S-3.5-4	1/10/2019	<0.39	<3.9	<0.77	<0.77	<3.9	<0.39	<1.9	<0.39	<0.77	<0.39	<0.39	<0.39	<0.39	<0.77	<0.77	<0.77	<0.39	<0.77	<0.77	<0.39	<0.39	<0.39	<1.0	<0.054
DG-U11	0.5-1	DG-U11S-0.5-1	1/10/2019	<0.39	<3.9	<0.77	<0.77	<3.9	<0.39	<1.9	<0.39	<0.77	<0.39	<0.39	<0.39	<0.39	<0.77	**3**	<0.77	<0.39	<0.77	<0.77	<0.39	<0.39	<0.39	<1.0	**4.1**
DG-U11	3.5-4	DG-U11S-3.5-4	1/10/2019	<0.48	<4.8	<0.96	<0.96	<4.8	<0.48	<2.4	<0.48	<0.96	<0.48	<0.48	<0.48	<0.48	<0.96	<0.96	<0.96	<0.48	<0.96	<0.96	<0.48	<0.48	<0.48	<1.2	<0.067
DG-U13	7.5-8	DG-U13S-7.5-8	12/21/2018	<0.21	<2.1	<0.43	<0.43	<2.1	<0.21	<1.1	<0.21	<0.43	<0.21	**0.27**	<0.21	<0.21	<0.43	<0.43	<0.43	<0.21	<0.43	<0.43	<0.21	<0.21	<0.21	<0.56	**0.45**
DG-U13	7.5-8	DG-U13S-7.5-8	2/1/2019	<0.36	<3.6	<0.71	<0.71	<3.6	**0.7**	<1.8	<0.36	**1.4**	<0.36	**0.75**	<0.36	<0.36	<0.71	<0.71	<0.71	<0.36	<0.71	<0.71	<0.36	<0.36	<0.36	<0.93	**0.74**
DG-U15	3.5-4	DG-U15S-3.5-4	1/28/2019	<0.40	<4.0	<0.79	<0.79	<4.0	<0.40	<2.0	**0.45**	<0.79	<0.40	<0.40	<0.40	<0.40	<0.79	<0.79	<0.79	<0.40	<0.79	<0.79	<0.40	<0.40	<0.40	<1.0	<0.055
DG-U15	8.5-9	DG-U15S-8.5-9	1/28/2019	<0.44	<4.4	<0.88	<0.88	<4.4	<0.44	<2.2	<0.44	**1.2**	<0.44	<0.44	<0.44	<0.44	<0.88	<0.88	<0.88	<0.44	<0.88	<0.88	<0.44	<0.44	<0.44	<1.1	**1**
DG-U17	0.5-1	DG-U17S-0.5-1	1/28/2019	<0.71	<7.1	<1.4	<1.4	<7.1	<0.71	<3.5	<0.71	<1.4	<0.71	<0.71	<0.71	<0.71	<1.4	<1.4	<1.4	<0.71	<1.4	<1.4	<0.71	<0.71	<0.71	<1.8	<0.099
DG-U3	0.5-1	DG-U3S-0.5-1	12/18/2018	<0.43	<4.3	<0.85	<0.85	<4.3	<0.43	<2.1	<0.43	<0.85	<0.43	<0.43	<0.43	<0.43	<0.85	<0.85	<0.85	<0.43	<0.85	<0.85	<0.43	<0.43	<0.43	<1.1	<0.060
DG-U3	3.5-4	DG-U3S-3.5-4	12/18/2018	<0.55	<5.5	<1.1	<1.1	<5.5	<0.55	<2.8	<0.55	<1.1	<0.55	<0.55	<0.55	<0.55	<1.1	<1.1	<1.1	<0.55	<1.1	<1.1	<0.55	<0.55	**2.3**	<1.4	<0.077
DG-U3 (D)	3.5-4	DG-U3 (D)S-3.5-4	12/18/2018	<0.36	<3.6	<0.73	<0.73	<3.6	<0.36	<1.8	<0.36	<0.73	<0.36	<0.36	<0.36	<0.36	<0.73	<0.73	<0.73	<0.36	<0.73	<0.73	<0.36	<0.36	**2.1**	<0.94	**0.18**
DG-U7	0.5-1	DG-U7S-0.5-1	1/8/2019	<0.36	<3.6	<0.71	<0.71	<3.6	<0.36	<1.8	<0.36	<0.71	<0.36	<0.36	<0.36	<0.36	<0.71	<0.71	<0.71	<0.36	<0.71	<0.71	<0.36	<0.36	<0.36	<0.93	<0.050

Table 5: Volatile Organic Compounds and Total Petroleum Hydrocarbons as Gasoline Concentrations in Soil
UPC OU-2
Brisbane, California

Sample Location	Depth Range (ft bgs)	Sample Name	Collection Date	1,1,1-Trichloroethane	1,1,2-Trichloro-1,2,2-trifluoroethane	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	2-Butanone	4-Isopropyltoluene	4-Methyl-2-pentanone	Benzene	Carbon disulfide	Chloroform	cis-1,2-Dichloroethene	Ethylbenzene	Isopropylbenzene	Methyl-tert-butyl ether (MTBE)	Naphthalene	n-Butylbenzene	n-Propylbenzene	sec-Butylbenzene	tert-Butylbenzene	Tetrachloroethene (PCE)	Toluene	Trichloroethene (TCE)	Xylenes, Total	TPH-Gasoline (C4-C12)
Direct Exposure Human Health Risk Level Residential Soil Exposure ESL [1]				1.7E+06	--	--	--	--	--	--	3.3E+02	--	3.2E+02	1.9E+04	5.9E+03	--	4.7E+04	3.8E+03	--	--	--	--	5.9E+02	1.1E+06	9.5E+02	5.8E+05	4.3E+05
Leaching to Groundwater Levels Non-drinking Water ESL [2]				7.0E+03	--	--	--	--	--	--	2.5E+01	--	2.3E+01	1.6E+03	4.3E+02	--	2.5E+03	1.2E+03	--	--	--	--	8.0E+01	1.0E+04	8.5E+01	1.0E+04	4.9E+03
EPA RSL for Resident Soil [3]				8.1E+06	6.7E+06	3.0E+05	2.7E+05	2.7E+07	--	3.3E+07	1.2E+03	7.7E+05	3.2E+02	1.6E+05	5.8E+03	1.9E+06	4.7E+04	3.8E+03	3.9E+06	3.8E+06	7.8E+06	7.8E+06	2.4E+04	4.9E+06	9.4E+02	5.8E+05	--
Units				µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	mg/kg
DG-U7	3.5-4	DG-U7S-3.5-4	1/8/2019	<0.36	<3.6	<0.71	<0.71	**15**	<0.36	<1.8	<0.36	<1.1	<0.36	<0.36	<0.36	<0.36	<0.71	<0.71	<0.71	<0.36	<0.71	<0.71	<0.36	<0.36	<0.36	<0.93	<0.050
DG-U7	3.5-4	DG-U7S-3.5-4	2/4/2019	<0.39	<3.9	<0.78	<0.78	**11**	<0.39	<2.0	<0.39	<0.78	<0.39	<0.39	<0.39	<0.39	<0.78	<0.78	<0.78	<0.39	<0.78	<0.78	<0.39	<0.39	<0.39	<1.0	<0.055
DG-V1	0.5-1	DG-V1S-0.5-1	12/17/2018	<0.37	<3.7	<0.75	<0.75	<3.7	<0.37	<1.9	<0.37	<0.75	<0.37	<0.37	<0.37	<0.37	<0.75	<0.75	<0.75	<0.37	<0.75	<0.75	<0.37	<0.37	<0.37	<0.97	<0.052
DG-V1	3.5-4	DG-V1S-3.5-4	12/17/2018	<0.56	<5.6	<1.1	<1.1	<5.6	<0.56	<2.8	<0.56	<1.1	<0.56	<0.56	<0.56	<0.56	<1.1	<1.1	<1.1	<0.56	<1.1	<1.1	<0.56	<0.56	<0.56	<1.5	<0.078
DG-V13	0.5-1	DG-V13S-0.5-1	1/10/2019	<1.0	<10	<2.0	<2.0	<10	<1.0	<5.0	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0	<2.0	<1.0	<2.0	<2.0	<1.0	<1.0	<1.0	<2.6	<0.14
DG-V13	3.5-4	DG-V13S-3.5-4	1/10/2019	<0.44	<4.4	<0.89	<0.89	<4.4	<0.44	<2.2	<0.44	<0.89	<0.44	<0.44	<0.44	<0.44	<0.89	<0.89	<0.89	<0.44	<0.89	<0.89	<0.44	<0.44	<0.44	<1.2	<0.062
DG-V13	7.5-8	DG-V13S-7.5-8	1/10/2019	<0.39	<3.9	<0.78	<0.78	<3.9	<0.39	<2.0	<0.39	<0.78	<0.39	<0.39	<0.39	<0.39	<0.78	<0.78	<0.78	<0.39	<0.78	<0.78	<0.39	<0.39	<0.39	<1.0	<0.055
DG-V17	0.5-1	DG-V17S-0.5-1	1/28/2019	<0.40	<4.0	<0.81	<0.81	<4.0	<0.40	<2.0	<0.40	<0.81	<0.40	<0.40	<0.40	<0.40	<0.81	<0.81	<0.81	<0.40	<0.81	<0.81	<0.40	<0.40	<0.40	<1.1	<0.057
DG-V17	3.5-4	DG-V17S-3.5-4	1/28/2019	<0.34	<3.4	<0.68	<0.68	<3.4	<0.34	<1.7	**0.35**	<0.68	<0.34	<0.34	<0.34	<0.34	<0.68	<0.68	<0.68	<0.34	<0.68	<0.68	<0.34	**0.58**	<0.34	<0.88	<0.047
DG-V17 (D)	3.5-4	DG-V17 (D)S-3.5-4	1/28/2019	<0.37	<3.7	<0.74	<0.74	<3.7	<0.37	<1.8	<0.37	<0.74	<0.37	<0.37	<0.37	<0.37	<0.74	<0.74	<0.74	<0.37	<0.74	<0.74	<0.37	<0.37	<0.37	<0.96	<0.052
DG-V17	9.5-10	DG-V17S-9.5-10	1/28/2019	<0.53	<5.3	<1.1	<1.1	**25**	<0.53	<2.6	<0.53	<1.1	<0.53	<0.53	<0.53	<0.53	<1.1	<1.1	<1.1	<0.53	<1.1	<1.1	<0.53	<0.53	<0.53	<1.4	<0.074
DG-V5	0.5-1	DG-V5S-0.5-1	1/8/2019	<0.43	<4.3	<0.86	<0.86	<4.3	<0.43	<2.2	<0.43	<0.86	<0.43	<0.43	<0.43	<0.43	<0.86	<0.86	<0.86	<0.43	<0.86	<0.86	<0.43	<0.43	<0.43	<1.1	<0.060
DG-V5	3.5-4	DG-V5S-3.5-4	1/8/2019	<0.34	<3.4	<0.69	<0.69	<3.4	<0.34	<1.7	**2.2**	<0.69	<0.34	<0.34	<0.34	<0.34	<0.69	<0.69	<0.69	<0.34	<0.69	<0.69	<0.34	**1.1**	<0.34	<0.90	<0.048
DG-V5	7.5-8	DG-V5S-7.5-8	1/8/2019	<0.34	<3.4	<0.69	<0.69	<3.4	<0.34	<1.7	<0.34	<0.69	<0.34	<0.34	<0.34	<0.34	<0.69	<0.69	<0.69	<0.34	<0.69	<0.69	<0.34	<0.34	<0.34	<0.90	<0.048
DG-V9	0.5-1	DG-V9S-0.5-1	1/10/2019	<0.37	<3.7	<0.74	<0.74	<3.7	<0.37	<1.8	<0.37	<0.74	<0.37	<0.37	<0.37	<0.37	<0.74	<0.74	<0.74	<0.37	<0.74	<0.74	<0.37	<0.37	<0.37	<0.96	<0.052
DG-V9	3.5-4	DG-V9S-3.5-4	1/10/2019	<0.39	<3.9	<0.78	<0.78	<3.9	<0.39	<1.9	<0.39	<0.78	<0.39	<0.39	<0.39	<0.39	<0.78	<0.78	<0.78	<0.39	<0.78	<0.78	<0.39	<0.39	<0.39	<1.0	<0.054
DG-V9	7.5-8	DG-V9S-7.5-8	1/10/2019	<0.36	<3.6	<0.71	<0.71	<3.6	<0.36	<1.8	<0.36	<0.71	<0.36	<0.36	<0.36	<0.36	<0.71	<0.71	<0.71	<0.36	<0.71	<0.71	<0.36	<0.36	<0.36	<0.93	<0.050
DG-W11	0.5-1	DG-W11S-0.5-1	1/29/2019	<0.37	<3.7	<0.74	<0.74	<3.7	<0.37	<1.8	<0.37	<0.74	<0.37	<0.37	<0.37	<0.37	<0.74	<0.74	<0.74	<0.37	<0.74	<0.74	<0.37	<0.37	<0.37	<0.96	<0.051
DG-W11	3.5-4	DG-W11S-3.5-4	1/29/2019	<0.38	<3.8	<0.77	<0.77	<3.8	<0.38	<1.9	<0.38	<0.77	<0.38	<0.38	<0.38	<0.38	<0.77	<0.77	<0.77	<0.38	<0.77	<0.77	<0.38	<0.38	<0.38	<1.0	<0.054
DG-W11 (D)	3.5-4	DG-W11 (D)S-3.5-4	1/29/2019	<0.39	<3.9	<0.78	<0.78	<3.9	<0.39	<1.9	<0.39	<0.78	<0.39	<0.39	<0.39	<0.39	<0.78	<0.78	<0.78	<0.39	<0.78	<0.78	<0.39	<0.39	<0.39	<1.0	<0.055
DG-W15	0.5-1	DG-W15S-0.5-1	1/28/2019	<0.46	<4.6	<0.93	<0.93	<4.6	<0.46	<2.3	<0.46	<0.93	<0.46	<0.46	<0.46	<0.46	<0.93	<0.93	<0.93	<0.46	<0.93	<0.93	<0.46	**0.53**	<0.46	<1.2	<0.065
DG-W15 (D)	0.5-1	DG-W15 (D)S-0.5-1	1/28/2019	<0.41	<4.1	<0.83	<0.83	<4.1	<0.41	<2.1	<0.41	<0.83	<0.41	<0.41	<0.41	<0.41	<0.83	<0.83	<0.83	<0.41	<0.83	<0.83	<0.41	<0.41	<0.41	<1.1	<0.058
DG-W15	3.5-4	DG-W15S-3.5-4	1/28/2019	<0.70	<7.0	<1.4	<1.4	<7.0	<0.70	<3.5	<0.70	<1.4	<0.70	<0.70	<0.70	<0.70	<1.4	<1.4	<1.4	<0.70	<1.4	<1.4	<0.70	**3**	<0.70	<1.8	**0.24**
DG-W3	0.5-1	DG-W3S-0.5-1	12/18/2018	<0.44	<4.4	<0.87	<0.87	<4.4	<0.44	<2.2	<0.44	<0.87	<0.44	<0.44	<0.44	<0.44	<0.87	<0.87	<0.87	<0.44	<0.87	<0.87	<0.44	<0.44	<0.44	<1.1	<0.061
DG-W3	3.5-4	DG-W3S-3.5-4	12/18/2018	<0.61	<6.1	<1.2	<1.2	<6.1	<0.61	<3.0	<0.61	<1.2	<0.61	<0.61	<0.61	<0.61	<1.2	<1.2	<1.2	<0.61	<1.2	<1.2	<0.61	<0.61	<0.61	<1.6	<0.085
DG-W7	0.5-1	DG-W7S-0.5-1	1/29/2019	<0.36	<3.6	<0.72	<0.72	<3.6	<0.36	<1.8	<0.36	<0.72	<0.36	<0.36	<0.36	<0.36	<0.72	<0.72	<0.72	<0.36	<0.72	<0.72	<0.36	**0.4**	<0.36	<0.94	<0.050
DG-W7	3.5-4	DG-W7S-3.5-4	1/29/2019	<0.43	<4.3	<0.87	<0.87	<4.3	<0.43	<2.2	**0.46**	<0.87	<0.43	<0.43	<0.43	<0.43	<0.87	<0.87	<0.87	<0.43	<0.87	<0.87	<0.43	<0.43	<0.43	<1.1	<0.061
DG-X1	0.5-1	DG-X1S-0.5-1	12/17/2018	<0.43	<4.3	<0.86	<0.86	<4.3	<0.43	<2.1	<0.43	<0.86	<0.43	<0.43	<0.43	<0.43	<0.86	<0.86	<0.86	<0.43	<0.86	<0.86	<0.43	<0.43	<0.43	<1.1	<0.060
DG-X1 (D)	0.5-1	DG-X1 (D)S-0.5-1	12/17/2018	<0.40	<4.0	<0.80	<0.80	<4.0	<0.40	<2.0	<0.40	<0.80	<0.40	<0.40	<0.40	<0.40	<0.80	<0.80	<0.80	<0.40	<0.80	<0.80	<0.40	<0.40	<0.40	<1.0	<0.056
DG-X1	3.5-4	DG-X1S-3.5-4	12/17/2018	<0.48	<4.8	<0.97	<0.97	<4.8	<0.48	<2.4	<0.48	<0.97	<0.48	<0.48	<0.48	<0.48	<0.97	<0.97	<0.97	<0.48	<0.97	<0.97	<0.48	<0.48	<0.48	<1.3	<0.068
DG-X13	0.5-1	DG-X13S-0.5-1	1/22/2019	<0.53	<5.3	<1.1	<1.1	<5.3	<0.53	<2.6	<0.53	<1.1	<0.53	<0.53	<0.53	<0.53	<1.1	<1.1	<1.1	<0.53	<1.1	<1.1	<0.53	<0.53	<0.53	<1.4	<0.074
DG-X13	3.5-4	DG-X13S-3.5-4	1/22/2019	<0.39	<3.9	<0.78	<0.78	<3.9	<0.39	<2.0	<0.39	<0.78	<0.39	<0.39	<0.39	<0.39	<0.78	<0.78	<0.78	<0.39	<0.78	<0.78	<0.39	<0.39	<0.39	<1.0	<0.055
DG-X13 (D)	3.5-4	DG-X13 (D)S-3.5-4	1/22/2019	<0.34	<3.4	<0.68	<0.68	<3.4	<0.34	<1.7	<0.34	<0.68	<0.34	<0.34	<0.34	<0.34	<0.68	<0.68	<0.68	<0.34	<0.68	<0.68	<0.34	<0.34	<0.34	<0.88	<0.047
DG-X17	0.5-1	DG-X17S-0.5-1	1/28/2019	<0.49	<4.9	<0.97	<0.97	<4.9	<0.49	<2.4	<0.49	<0.97	<0.49	<0.49	<0.49	<0.49	<0.97	<0.97	<0.97	<0.49	<0.97	<0.97	<0.49	<0.49	<0.49	<1.3	<0.068
DG-X17	3.5-4	DG-X17S-3.5-4	1/28/2019	<0.39	<3.9	<0.78	<0.78	<3.9	<0.39	<1.9	<0.39	<0.78	<0.39	<0.39	<0.39	<0.39	<0.78	<0.78	<0.78	<0.39	<0.78	<0.78	<0.39	<0.39	<0.39	<1.0	<0.054
DG-X5	0.5-1	DG-X5S-0.5-1	1/8/2019	<0.37	<3.7	<0.74	<0.74	**20**	<0.37	<1.9	<0.37	<0.74	<0.37	<0.37	<0.37	<0.37	<0.74	<0.74	<0.74	<0.37	<0.74	<0.74	<0.37	<0.37	<0.37	<0.97	<0.052
DG-X5	3.5-4	DG-X5S-3.5-4	1/8/2019	<0.29	<2.9	<0.57	<0.57	<2.9	<0.29	<1.4	<0.29	<0.57	<0.29	<0.29	<0.29	<0.29	<0.57	<0.57	<0.57	<0.29	<0.57	<0.57	<0.29	<0.29	<0.29	<0.74	<0.040
DG-X9	0.5-1	DG-X9S-0.5-1	1/10/2019	<0.42	<4.2	<0.84	<0.84	<4.2	<0.42	<2.1	<0.42	<0.84	<0.42	<0.42	<0.42	<0.42	<0.84	<0.84	<0.84	<0.42	<0.84	<0.84	<0.42	<0.42	<0.42	<1.1	<0.059
DG-X9	3.5-4	DG-X9S-3.5-4	1/10/2019	<0.39	<3.9	<0.79	<0.79	<4.9	<0.39	<2.0	<0.39	<0.79	<0.39	<0.39	<0.39	<0.39	<0.79	<0.79	<0.79	<0.39	<0.79	<0.79	<0.39	<0.39	<0.39	<1.0	<0.055
DG-Y11	0.5-1	DG-Y11S-0.5-1	1/21/2019	<0.37	<3.7	<0.75	<0.75	<3.7	<0.37	<1.9	<0.37	<0.75	<0.37	<0.37	<0.37	<0.37	<0.75	<0.75	<0.75	<0.37	<0.75	<0.75	<0.37	<0.37	<0.37	<0.97	<0.052
DG-Y11	3.5-4	DG-Y11S-3.5-4	1/21/2019	<0.37	<3.7	<0.74	<0.74	<3.7	<0.37	<1.8	<0.37	<0.74	<0.37	<0.37	<0.37	<0.37	<0.74	<0.74	<0.74	<0.37	<0.74	<0.74	<0.37	<0.37	<0.37	<0.96	<0.052
DG-Y15	0.5-1	DG-Y15S-0.5-1	1/31/2019	<0.44	<4.4	<0.89	<0.89	<4.4	<0.44	<2.2	<0.44	<0.89	<0.44	<0.44	<0.44	<0.44	<0.89	<0.89	<0.89	<0.44	<0.89	<0.89	**0.45**	<0.44	<0.44	<1.2	<0.062
DG-Y15	3.5-4	DG-Y15S-3.5-4	1/31/2019	<0.44	<4.4	<0.88	<0.88	<4.4	<0.44	<2.2	<0.44	<0.88	<0.44	<0.44	<0.44	<0.44	<0.88	<0.88	<0.88	<0.44	<0.88	<0.88	**1.2**	<0.44	<0.44	<1.1	<0.062
DG-Y15 (D)	3.5-4	DG-Y15 (D)S-3.5-4	1/31/2019	<0.36	<3.6	<0.73	<0.73	<3.6	<0.36	<1.8	<0.36	<0.73	<0.36	<0.36	<0.36	<0.36	<0.73	<0.73	<0.73	<0.36	<0.73	<0.73	**1.1**	<0.36	<0.36	<0.94	<0.051
DG-Y15	7.5-8	DG-Y15S-7.5-8	1/31/2019	**120**	<400	<100	<100	<1,000	<100	<400	<100	<250	<100	**540**	<100	<100	<200	<200	<200	<100	<100	<200	<100	<100	**100**	<200	**210**
DG-Y19	0.5-1	DG-Y19S-0.5-1	1/28/2019	<0.45	<4.5	<0.90	<0.90	<4.5	<0.45	<2.3	<0.45	<0.90	<0.45	<0.45	<0.45	<0.45	<0.90	<0.90	<0.90	<0.45	<0.90	<0.90	<0.45	<0.45	<0.45	<1.2	<0.060

Table 5: Volatile Organic Compounds and Total Petroleum Hydrocarbons as Gasoline Concentrations in Soil
UPC OU-2
Brisbane, California

Sample Location	Depth Range (ft bgs)	Sample Name	Collection Date	1,1,1-Trichloroethane	1,1,2-Trichloro-1,2,2-trifluoroethane	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	2-Butanone	4-Isopropyltoluene	4-Methyl-2-pentanone	Benzene	Carbon disulfide	Chloroform	cis-1,2-Dichloroethene	Ethylbenzene	Isopropylbenzene	Methyl-tert-butyl ether (MTBE)	Naphthalene	n-Butylbenzene	n-Propylbenzene	sec-Butylbenzene	tert-Butylbenzene	Tetrachloroethene (PCE)	Toluene	Trichloroethene (TCE)	Xylenes, Total	TPH-Gasoline (C4-C12)
Direct Exposure Human Health Risk Level Residential Soil Exposure ESL [1]				1.7E+06	--	--	--	--	--	--	3.3E+02	--	3.2E+02	1.9E+04	5.9E+03	--	4.7E+04	3.8E+03	--	--	--	--	5.9E+02	1.1E+06	9.5E+02	5.8E+05	4.3E+05
Leaching to Groundwater Levels Non-drinking Water ESL [2]				7.0E+03	--	--	--	--	--	--	2.5E+01	--	2.3E+01	1.6E+03	4.3E+02	--	2.5E+03	1.2E+03	--	--	--	--	8.0E+01	1.0E+04	8.5E+01	1.0E+04	4.9E+03
EPA RSL for Resident Soil [3]				8.1E+06	6.7E+06	3.0E+05	2.7E+05	2.7E+07	--	3.3E+07	1.2E+03	7.7E+05	3.2E+02	1.6E+05	5.8E+03	1.9E+06	4.7E+04	3.8E+03	3.9E+06	3.8E+06	7.8E+06	7.8E+06	2.4E+04	4.9E+06	9.4E+02	5.8E+05	--
Units				µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	mg/kg
DG-Y19	3.5-4	DG-Y19S-3.5-4	1/28/2019	<0.36	<3.6	<0.73	<0.73	<3.6	<0.36	<1.8	<0.36	<0.73	<0.36	<0.36	<0.36	<0.36	<0.73	<0.73	<0.73	<0.36	<0.73	<0.73	<0.36	<0.36	<0.36	<0.95	<0.047
DG-Y19	7.5-8	DG-Y19S-7.5-8	1/28/2019	<0.36	<3.6	<0.73	<0.73	<3.6	<0.36	<1.8	<0.36	<0.73	<0.36	<0.36	<0.36	<0.36	<0.73	<0.73	<0.73	<0.36	<0.73	<0.73	<0.36	<0.36	<0.36	<0.95	<0.051
DG-Y3	0.5-1	DG-Y3S-0.5-1	12/18/2018	<0.44	<4.4	<0.88	<0.88	<4.4	<0.44	<2.2	<0.44	<0.88	<0.44	<0.44	<0.44	<0.44	<0.88	<0.88	<0.88	<0.44	<0.88	<0.88	<0.44	<0.44	<0.44	<1.1	<0.061
DG-Y3	3.5-4	DG-Y3S-3.5-4	12/18/2018	<0.48	<4.8	<0.97	<0.97	<4.8	<0.48	<2.4	<0.48	<0.97	<0.48	<0.48	<0.48	<0.48	<0.97	<0.97	<0.97	<0.48	<0.97	<0.97	<0.48	<0.48	<0.48	<1.3	<0.068
DG-Y7	0.5-1	DG-Y7S-0.5-1	1/9/2019	<0.37	<3.7	<0.74	<0.74	<3.7	<0.37	<1.9	<0.37	<0.74	<0.37	<0.37	<0.37	<0.37	<0.74	<0.74	<0.74	<0.37	<0.74	<0.74	<0.37	<0.37	<0.37	<0.97	<0.052
DG-Y7	3.5-4	DG-Y7S-3.5-4	1/9/2019	<0.41	<4.1	<0.82	<0.82	<4.1	<0.41	<2.1	<0.41	<0.82	<0.41	<0.41	<0.41	<0.41	<0.82	<0.82	<0.82	<0.41	<0.82	<0.82	<0.41	<0.41	<0.41	<1.1	<0.058
DG-Z13	0.5-1	DG-Z13S-0.5-1	1/28/2019	<0.51	<5.1	<1.0	<1.0	**16**	<0.51	<2.6	**0.6**	<1.0	<0.51	<0.51	**0.91**	<0.51	<1.0	**5.1**	<1.0	<0.51	<1.0	<1.0	<0.51	**2.7**	<0.51	**12**	**0.1**
DG-Z13	3.5-4	DG-Z13S-3.5-4	1/28/2019	<0.35	<3.5	<0.70	<0.70	<3.5	<0.35	<1.7	<0.35	<0.70	<0.35	<0.35	<0.35	<0.35	<0.70	<0.70	<0.70	<0.35	<0.70	<0.70	<0.35	<0.35	<0.35	<0.91	<0.049
DG-Z17	0.5-1	DG-Z17S-0.5-1	1/28/2019	<0.47	<4.7	<0.94	<0.94	<4.7	<0.47	<2.3	<0.47	<0.94	<0.47	<0.47	<0.47	<0.47	<0.94	<0.97	<0.94	<0.47	<0.94	<0.94	<0.47	<0.47	<0.47	<1.2	<0.066
DG-Z17 (D)	0.5-1	DG-Z17 (D)S-0.5-1	1/28/2019	<0.45	<4.5	<0.89	<0.89	<4.5	<0.45	<2.2	<0.45	<0.89	<0.45	<0.45	<0.45	<0.45	<0.89	<0.89	<0.89	<0.45	<0.89	<0.89	<0.45	**0.8**	<0.45	<1.2	<0.063
DG-Z17	3.5-4	DG-Z17S-3.5-4	1/28/2019	<0.43	<4.3	<0.85	<0.85	<4.3	<0.43	<2.1	<0.43	<0.85	<0.43	<0.43	<0.43	<0.43	<0.85	<0.85	<0.85	<0.43	<0.85	<0.85	**2.2**	<0.43	<0.43	<1.1	<0.060
DG-Z17	7.5-8	DG-Z17S-7.5-8	1/28/2019	<43	<170	<43	<43	<430	<43	<170	<43	<110	<43	<43	<43	<43	<86	<86	<86	<43	<43	<86	<43	<43	<43	<86	**39**
DG-Z5	0.5-1	DG-Z5S-0.5-1	1/8/2019	<0.37	<3.7	<0.74	<0.74	<3.7	<0.37	<1.8	<0.37	<0.74	<0.37	<0.37	<0.37	<0.37	<0.74	<0.74	<0.74	<0.37	<0.74	<0.74	<0.37	<0.37	<0.37	<0.96	<0.051
DG-Z5	3.5-4	DG-Z5S-3.5-4	1/8/2019	<0.34	<3.4	<0.69	<0.69	<3.4	<0.34	<1.7	<0.34	<0.69	<0.34	<0.34	<0.34	<0.34	<0.69	<0.69	<0.69	<0.34	<0.69	<0.69	<0.34	<0.34	<0.34	<0.90	<0.048
DG-Z9	0.5-1	DG-Z9S-0.5-1	1/9/2019	<0.44	<4.4	<0.88	<0.88	<4.4	<0.44	<2.2	<0.44	<0.88	<0.44	<0.44	<0.44	<0.44	<0.88	<0.88	<0.88	<0.44	<0.88	<0.88	<0.44	<0.44	<0.44	<1.1	<0.061
DG-Z9 (D)	0.5-1	DG-Z9 (D)S-0.5-1	1/9/2019	<0.52	<5.2	<1.0	<1.0	<5.2	<0.52	<2.6	<0.52	<1.0	<0.52	<0.52	<0.52	<0.52	<1.0	<1.0	<1.0	<0.52	<1.0	<1.0	<0.52	<0.52	<0.52	<1.4	<0.073
DG-Z9	3.5-4	DG-Z9S-3.5-4	1/9/2019	<0.42	<4.2	<0.85	<0.85	<4.2	<0.42	<2.1	<0.42	<0.85	<0.42	<0.42	<0.42	<0.42	<0.85	<0.85	<0.85	<0.42	<0.85	<0.85	<0.42	<0.42	<0.42	<1.1	<0.059

Notes:
1. San Francisco Bay RWQCB, 2019. Summary of Soil ESLs, Jan. 2019 (Rev. 1) - Direct Exposure Human Health Risk Levels (Table S-1) Res: Shallow Soil Exposure.
2. San Francisco Bay RWQCB, 2019. Summary of Soil ESLs, Jan. 2019 (Rev. 1) - Leaching to Groundwater Levels (Table S-3) Non-drinking Water.
3. EPA, 2018. Regional Screening Levels - Generic Tables (November 2018). Screening level for "Resident Soil."
4. The RWQCB ESL is used as comparison criteria when available. If RWQCB ESLs are not available, EPA RSL was selected for use as comparison criteria.
5. VOCs and TPH-g were analyzed by USEPA Method 8260B.
6. Only analytes with detections are included in this table.
7. Non-detect results are presented with "<" followed by the MDL.
8. Results in bold font indicate a detection above the MDL.
9. Gray shading indicates a detection above the comparison criteria.

Abbreviations and Symbols:
"--" - Not Available
"<" - Non-detect result
µg/kg - microgram per kilogram
mg/kg - milligram per kilogram
(D) - Duplicate sample
ft bgs - Feet below ground surface
TPH-g - total petroleum hydrocarbons as gasoline
USEPA - United States Environmental Protection Agency
VOC - Volatile Organic Compound
ESL - Environmental Screening Level
RWQCB - Regional Water Quality Control Board
RSL - Regional Screening Level

Table 6: Goundwater Elevations in A-Fill Water-Bearing Zone, December 2018

UPC OU-2

Brisbane, California

Well Name	Screened Interval (ft bgs)	Date	Top of Casing Elevation (ft MSL)[1,2]	Depth to Groundwater (ft bgs)	Groundwater Elevation (ft MSL)[1,2]
KMW-4A	2-11	12/18/2018	10.46	4.66	5.80
KMW-7A	2-11	12/18/2018	13.66	7.92	5.74
LF-3A	4-10	12/18/2018	10.95	5.02	5.93
LF-4A	4-14	12/18/2018	8.32	2.32	6.00
LF-5A	2.5-8	12/18/2018	8.49	2.78	5.71
LF-7A	4-8	12/18/2018	10.65	5.45	5.20
LF-8A	5-10	12/18/2018	9.36	4.03	5.33
MK-1A	3-13	12/18/2018	10.47	4.70	5.77
MK-2A	3-13	12/18/2018	12.81	4.49	8.32
MK-7A	3-10	12/18/2018	10.50	5.36	5.14
MK-8A	5-10	12/18/2018	16.58	10.55	6.03
MW-9A	3-13	12/18/2018	11.26	5.62	5.64
MW-10A	3-13	12/18/2018	9.59	4.89	4.70
MW-11AR	3-13	12/18/2018	14.19	9.61	4.58
MW-13A	3-13	12/18/2018	7.81	3.89	3.92
MW-15A	3-13	12/18/2018	8.67	3.77	4.90
MW-17A	3-13	12/18/2018	8.45	2.56	5.89

Notes:

1. Source: Levine-Fricke, 1990. *Supplemental Remedial Investigation Data Study Report* , The Bayshore Railyard, Brisbane, California. 18 July.

2. Elevations were measured during well installation and may have changed since the time of measurement.

-- = Not Calculated/Not Applicable

ft = feet

MSL = Mean Sea Level

Table 7: Dissolved Metals Concentrations in Groundwater, A-Fill Water-Bearing Zone

UPC OU-2

Brisbane, California

Sample Location	Sample Name	Collection Date	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Chromium, Hexavalent	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
Aquatic Habitat Goal Saltwater Ecotox ESL [1]			5.0E+02	3.6E+01	-	-	9.3E+00	1.0E+03	5.0E+01	-	3.1E+00	8.1E+00	2.5E-02	-	8.2E+00	5.0E-01	1.9E-01	2.1E+02	-	8.1E+01
		Units	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
DG-AA11	DG-AA11W	1/30/2019	**4.3**	**3.5**	**110**	**0.65**	<0.21	**1.4**	<3.7	<0.68	<3.7	<2.2	<0.10	<2.9	<1.0	<4.6	<2.0	<3.5	**0.99**	<7.4
DG-AA15	DG-AA15W	1/25/2019	<4.1	<2.9	**66**	<0.59	<0.21	**1.6**	<3.7	<0.68	<3.7	<2.2	<0.10	<2.9	<1.0	<4.6	<2.0	<3.5	<0.87	<7.4
DG-AA19	DG-AA19W	1/25/2019	<4.1	**17**	**1700**	<0.59	<0.21	**1.3**	<3.7	<0.68	<3.7	<2.2	<0.10	<2.9	<1.0	<4.6	<2.0	<3.5	<0.87	<7.4
DG-AA3	DG-AA3W	12/18/2018	<4.1	**27**	**310**	<0.59	<0.21	**1.3**	<3.7	**12**	**7.2**	**9.7**	<0.10	**4.9**	**14**	<4.6	<2.0	<3.5	**1.5**	<7.4
DG-AA7	DG-AA7W	1/11/2019	<4.1	**11**	**180**	<0.59	<0.21	<0.70	<3.7	**1.7**	**8.4**	**4.7**	<0.10	**4.9**	**2.1**	<4.6	<2.0	**5.5**	<0.87	**65**
DG-AB13	DG-AB13W	1/25/2019	<4.1	**4.2**	**280**	<0.59	<0.21	**0.91**	<3.7	**0.83**	<3.7	<2.2	<0.10	<2.9	**3.1**	<4.6	<2.0	<3.5	**0.89**	**9.8**
DG-AB13 (D)	DG-AB13 (D)W	1/25/2019	<4.1	**5.3**	**290**	<0.59	<0.21	<0.70	<3.7	<0.68	<3.7	<2.2	<0.10	<2.9	<1.0	<4.6	<2.0	<3.5	<0.87	**8.6**
DG-AB17	DG-AB17W	1/25/2019	<4.1	<2.9	**110**	<0.59	<0.21	<0.70	<3.7	<0.68	<3.7	<2.2	<0.10	<2.9	<1.0	<4.6	<2.0	<3.5	<0.87	<7.4
DG-AB5	DG-AB5W	1/31/2019	<4.1	**39**	**69**	**1.2**	**0.88**	**1.2**	<3.7	**5.1**	**5.7**	**8.4**	<0.10	**5.3**	**3.8**	<4.6	<2.0	<3.5	<0.87	<7.4
DG-AB5 (D)	DG-AB5 (D)W	1/31/2019	<4.1	**49**	**70**	<0.59	<0.21	<0.70	<3.7	**4.2**	**6.5**	**8.2**	<0.10	**5.6**	**2.4**	<4.6	<2.0	<3.5	<0.87	<7.4
DG-AC15	DG-AC15W	2/1/2019	<4.1	**64**	**1900**	<0.59	<0.21	<0.70	<3.7	**1.4**	**3.7**	**9.3**	<0.10	<2.9	**1.3**	<4.6	<2.0	<3.5	<0.87	<7.4
DG-AC3	DG-AC3W	12/19/2018	<4.1	**50**	**160**	<0.59	**0.21**	**3.0**	<3.7	**16**	**6.0**	**11**	<0.10	**5**	**17**	<4.6	<2.0	<3.5	**1.7**	**13**
DG-AC7	DG-AC7W	1/11/2019	**8.0**	**5.5**	**150**	<0.59	**0.32**	**1.3**	<3.7	**1.4**	**23**	<2.2	<0.10	**12**	**2.4**	<4.6	<2.0	**4.6**	<0.87	**43**
DG-AC7 (D)	DG-AC7 (D)W	1/11/2019	**5.9**	<2.9	**150**	<0.59	**0.38**	**1.1**	<3.7	**1.9**	**21**	**7.6**	<0.10	**11**	**2.6**	<4.6	<2.0	<3.5	**0.99**	**39**
DG-AD13	DG-AD13W	2/1/2019	<4.1	**13**	**770**	<0.59	<0.21	**1.7**	**48**	**2.5**	<3.7	**8.8**	<0.10	**5.3**	**24**	<4.6	<2.0	<14	**20**	<7.4
DG-AD13 (D)	DG-AD13 (D)W	2/1/2019	<4.1	**12**	**890**	<0.59	<0.21	**1.9**	**47**	**2.8**	**6.0**	**15**	<0.10	**5.9**	**29**	<4.6	<2.0	**7.8**	**20**	**11**
DG-AD17	DG-AD17W	1/25/2019	<4.1	**13**	**310**	<0.59	<0.21	<0.70	<3.7	**3.3**	<3.7	<2.2	<0.10	**12**	**7.2**	<4.6	<2.0	<3.5	<0.87	<7.4
DG-AD5	DG-AD5W	1/7/2019	**20**	**120**	**210**	<0.59	**0.43**	**0.96**	<3.7	**1.9**	**26**	**17**	<0.10	**13**	**1.2**	<4.6	<2.0	<3.5	<0.87	**11**
DG-AD9	DG-AD9W	1/11/2019	<4.1	**5.3**	**240**	<0.59	**0.42**	**1.2**	<3.7	**3.4**	**6.5**	**25**	<0.10	**6.1**	**16**	<4.6	**2.5**	<3.5	<0.87	**210**
DG-AE11	DG-AE11W	1/22/2019	<4.1	**27**	**1200**	<0.59	<0.21	**0.77**	<3.7	<0.68	<3.7	<2.2	<0.10	**5.3**	**7.6**	<4.6	<2.0	**6.0**	<0.87	<7.4
DG-AE3	DG-AE3W	12/19/2018	<4.1	**120**	**220**	**0.75**	**0.27**	**4.7**	<3.7	**12**	<3.7	**9.6**	<0.10	**3.2**	**12**	<4.6	<2.0	<3.5	**2.0**	**8.2**
DG-AE7	DG-AE7W	1/11/2019	<4.1	**10**	**190**	<0.59	<0.21	**0.75**	<3.7	**2.0**	**4.5**	**6.6**	<0.10	**4.3**	**3.9**	<4.6	<2.0	**6.0**	<0.87	**18**
DG-AF5	DG-AF5W	1/7/2019	<4.1	**130**	**240**	<0.59	**1.4**	**0.99**	<3.7	**8.4**	**14**	**14**	**0.11**	**9.3**	**11**	<4.6	<2.0	<3.5	<0.87	**130**
DG-AG11	DG-AG11W	1/22/2019	<4.1	**28**	**1900**	<0.59	<0.21	**1.1**	<3.7	<0.68	<3.7	<2.2	<0.10	<2.9	**1.8**	<4.6	<2.0	<3.5	<0.87	<7.4
DG-AG15	DG-AG15W	1/24/2019	<4.1	**7.5**	**220**	<0.59	<0.21	**2.3**	<3.7	**4.2**	<3.7	<2.2	**0.15**	<2.9	**4.9**	<4.6	<2.0	<3.5	**3.1**	<7.4
DG-AG3	DG-AG3W	12/19/2018	<4.1	**86**	**150**	**0.74**	<0.21	**7.6**	<3.7	**13**	<3.7	<2.2	<0.10	**17**	**19**	<4.6	<2.0	**6.9**	**3.1**	**25**
DG-AG7	DG-AG7W	1/31/2019	<4.1	**9.9**	**230**	**0.64**	**0.41**	**1.4**	<3.7	**3.5**	**3.8**	**9.6**	<0.10	**7.2**	**3.1**	<4.6	<2.0	<3.5	<0.87	**27**
DG-AH13	DG-AH13W	1/29/2019	<4.1	**4.7**	**110**	<0.59	<0.21	**2.0**	<3.7	**3.7**	**4.7**	<2.2	<0.10	<2.9	<1.0	<4.6	<2.0	<3.5	**4.2**	<7.4
DG-AH5	DG-AH5W	1/7/2019	**11**	**18**	**140**	**0.67**	<0.21	**1.5**	<3.7	**4.1**	**44**	**8.9**	<0.10	**24**	**4**	<4.6	<2.0	<3.5	**2.7**	<7.4
DG-AI15	DG-AI15W	1/25/2019	<4.1	**16**	**250**	<0.59	<0.21	<0.70	<3.7	<0.68	<3.7	<2.2	<0.10	<2.9	**6.9**	<4.6	<2.0	<3.5	<0.87	**7.4**
DG-AI3	DG-AI3W	12/19/2018	<4.1	**110**	**220**	<0.59	<0.21	**3.4**	<3.7	**13**	**4.2**	**10**	<0.10	**4**	**12**	<4.6	<2.0	<3.5	**2.5**	**8.6**
DG-AI3 (D)	DG-AI3 (D)W	12/19/2018	<4.1	**110**	**230**	<0.59	<0.21	**3.4**	<3.7	**14**	**4.6**	**11**	<0.10	**3.7**	**13**	<4.6	<2.0	<3.5	**2.6**	**12**
DG-AI7	DG-AI7W	1/11/2019	<4.1	**8.9**	**200**	**0.68**	**1.0**	**2.2**	<3.7	**2.5**	<3.7	**9.9**	<0.10	**4.1**	**2.6**	<4.6	<2.0	<3.5	<0.87	**15**
DG-AJ13	DG-AJ13W	1/29/2019	<4.1	**9.8**	**1300**	<0.59	<0.21	**1.2**	<3.7	**0.87**	<3.7	<2.2	<0.10	**3.5**	**1.2**	<4.6	<2.0	<3.5	**1.1**	**41**
DG-AJ5	DG-AJ5W	1/7/2019	**21**	**180**	**940**	**4.7**	**4.1**	**380**	<3.7	**77**	**450**	**320**	**0.14**	**14**	**420**	<4.6	**2.0**	<3.5	**280**	**540**
DG-AK11	DG-AK11W	1/29/2019	<4.1	**12**	**1700**	<0.59	<0.21	**1.4**	<3.7	<0.68	<3.7	<2.2	<0.10	**8.6**	<1.0	<4.6	<2.0	<3.5	<0.87	<7.4
DG-AK15	DG-AK15W	1/24/2019	<4.1	**9.2**	**290**	<0.59	<0.21	**3.0**	<3.7	**5.8**	**5.5**	<2.2	<0.10	**7.0**	**2.0**	<4.6	<2.0	<3.5	**2.4**	<7.4
DG-AK3	DG-AK3W	12/19/2018	<4.1	**110**	**250**	<0.59	**0.23**	**3.1**	<3.7	**12**	**32**	**11**	**0.22**	**6.8**	**17**	<4.6	<2.0	<3.5	**2.8**	<7.4
DG-AK7	DG-AK7W	1/11/2019	<4.1	**7.9**	**200**	<0.59	**0.23**	**1.3**	<3.7	**3.2**	**3.7**	**11**	<0.10	**4.9**	**5.2**	<4.6	<2.0	<3.5	<0.87	**45**

Table 7: Dissolved Metals Concentrations in Groundwater, A-Fill Water-Bearing Zone

UPC OU-2

Brisbane, California

Sample Location	Sample Name	Collection Date	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Chromium, Hexavalent	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
Aquatic Habitat Goal Saltwater Ecotox ESL [1]			5.0E+02	3.6E+01	-	-	9.3E+00	1.0E+03	5.0E+01	-	3.1E+00	8.1E+00	2.5E-02	-	8.2E+00	5.0E-01	1.9E-01	2.1E+02	-	8.1E+01
		Units	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
DG-AK7 (D)	DG-AK7 (D)W	1/11/2019	<4.1	**8.0**	**200**	<0.59	<0.21	**0.73**	<3.7	**2.9**	<3.7	**11**	<0.10	**4.1**	**4.0**	<4.6	<2.0	<3.5	<0.87	**43**
DG-AL13	DG-AL13W	1/29/2019	**5.7**	**18**	**870**	<0.59	<0.21	**1.4**	<3.7	**1.3**	**6.6**	<2.2	<0.10	**4.0**	**1.8**	<4.6	<2.0	<3.5	<0.87	**56**
DG-AL5	DG-AL5W	1/31/2019	<4.1	**160**	**170**	**0.61**	<0.21	**1.7**	<3.7	**6.0**	**11**	**11**	<0.10	**9.7**	**8.3**	<4.6	<2.0	<3.5	**1.5**	**14**
DG-AL9	DG-AL9W	1/22/2019	<4.1	**9.7**	**140**	<0.59	<0.21	**1.0**	<3.7	**1.7**	<3.7	<2.2	<0.10	<2.9	**2.0**	<4.6	<2.0	**13**	<0.87	**21**
DG-AM15	DG-AM15W	1/24/2019	<4.1	**2.9**	**34**	<0.59	<0.21	**1.5**	<3.7	<0.68	**3.9**	<2.2	<0.10	**4.4**	**1.1**	<4.6	<2.0	<3.5	**2.3**	<7.4
DG-AM3	DG-AM3W	12/19/2018	<4.1	**110**	**390**	<0.59	<0.21	**3.1**	<3.7	**11**	**4.6**	<2.2	<0.10	**5.3**	**15**	<4.6	<2.0	**7.3**	**2.3**	**20**
DG-AM7	DG-AM7W	1/11/2019	<4.1	**15**	**280**	**0.61**	**0.47**	**1.7**	<3.7	**4.3**	**5.7**	**8.8**	<0.10	**4.9**	**4.7**	<4.6	**2.4**	<3.5	<0.87	**23**
DG-AN13	DG-AN13W	2/1/2019	<4.1	**4.1**	**82**	<0.59	<0.21	<0.70	<3.7	**1.3**	**9.4**	**29**	<0.10	<2.9	<1.0	<4.6	<2.0	<3.5	<0.87	<7.4
DG-AN5	DG-AN5W	12/20/2018	<4.1	**200**	**160**	<0.59	<0.21	**2.2**	<3.7	**6.4**	<3.7	<2.2	<0.10	**4.6**	**6.6**	<4.6	<2.0	**5.6**	**1.7**	**21**
DG-AN9	DG-AN9W	1/21/2019	<4.1	**7.1**	**110**	<0.59	**0.21**	**1.2**	<3.7	**3.4**	**6.1**	**2.7**	<0.10	**4.0**	**3.4**	<4.6	<2.0	**8.9**	<0.87	**55**
DG-AO3	DG-AO3W	12/19/2018	<4.1	**110**	**150**	<0.59	<0.21	**4.1**	<3.7	**9.6**	<3.7	**12**	<0.10	**2.9**	**10**	<4.6	<2.0	<3.5	**2.3**	**24**
DG-AO7	DG-AO7W	1/11/2019	**5.3**	**13**	**290**	**0.64**	**1.4**	**1.3**	<3.7	**6.1**	**7.5**	**13**	<0.10	**8.4**	**7.6**	<4.6	**2.8**	<3.5	**1.1**	**57**
DG-AP5	DG-AP5W	12/20/2018	<4.1	**89**	**100**	<0.59	<0.21	**3.0**	<3.7	**7.4**	**5.5**	<2.2	<0.10	**4.4**	**8.0**	<4.6	<2.0	**7.6**	**1.9**	**11**
DG-AP9	DG-AP9W	1/21/2019	**4.7**	**3.9**	**140**	<0.59	**0.74**	**1.5**	<3.7	**4.2**	**17**	<2.2	<0.10	**4.4**	**4.8**	<4.6	<2.0	<3.5	<0.87	**78**
DG-AQ11	DG-AQ11W	1/31/2019	<4.1	**4.1**	**570**	**0.59**	<0.21	<0.70	<3.7	**1.8**	<3.7	**9.1**	<0.10	<2.9	<1.0	<4.6	<2.0	<3.5	<0.87	**12**
DG-AQ3	DG-AQ3W	12/19/2018	<4.1	**110**	**270**	<0.59	<0.21	**2.7**	<3.7	**12**	<3.7	**9.3**	<0.10	**3.5**	**11**	<4.6	<2.0	<3.5	**1.9**	**10**
DG-AQ7	DG-AQ7W	1/31/2019	<4.1	**34**	**82**	<0.59	**0.21**	**1.8**	<3.7	**6.5**	**12**	**16**	**0.19**	<2.9	**8.6**	<4.6	<2.0	<3.5	<0.87	**51**
DG-AR5	DG-AR5W	12/20/2018	<4.1	**70**	**190**	<0.59	<0.21	**2.9**	<3.7	**9.0**	**9.7**	<2.2	<0.10	**3.2**	**7.8**	**4.9**	<2.0	**8.1**	**1.8**	<7.4
DG-AR9	DG-AR9W	1/11/2019	<4.1	**12**	**120**	<0.59	<0.21	**0.74**	<3.7	**5.2**	**15**	**7.8**	<0.10	**7.4**	**5.5**	<4.6	**2.1**	<3.5	<0.87	**59**
DG-AR9 (D)	DG-AR9 (D)W	1/11/2019	<4.1	**11**	**140**	<0.59	<0.21	**0.72**	<3.7	**5.5**	**15**	**6.8**	<0.10	**7.4**	**5.7**	<4.6	**2.4**	<3.5	**0.88**	**59**
DG-AS11	DG-AS11W	1/31/2019	<4.1	<2.9	**250**	**0.6**	**0.41**	<0.70	<3.7	**1.2**	**21**	**16**	<0.10	<2.9	**4.6**	<4.6	<2.0	<3.5	<0.87	**220**
DG-AS3	DG-AS3W	12/20/2018	<4.1	**52**	**210**	<0.59	<0.21	**1.8**	<3.7	**5.8**	<3.7	<2.2	<0.10	**3.2**	**6.4**	<4.6	<2.0	**6.5**	**1.5**	<7.4
DG-AS3 (D)	DG-AS3 (D)W	12/20/2018	<4.1	**53**	**210**	<0.59	<0.21	**1.7**	<3.7	**5.9**	<3.7	<2.2	<0.10	**3.1**	**6.0**	**5.2**	<2.0	**5.0**	**1.3**	<7.4
DG-AS7	DG-AS7W	1/11/2019	<4.1	**8.6**	**210**	<0.59	**0.32**	**1.3**	<3.7	**3.2**	**21**	**14**	<0.10	**6.0**	**6.3**	<4.6	<2.0	**3.5**	<0.87	**150**
DG-AT5	DG-AT5W	12/20/2018	<4.1	**19**	**190**	<0.59	**0.3**	**1.1**	<3.7	**4.8**	**32**	<2.2	<0.10	**4.2**	**4.5**	<4.6	<2.0	<3.5	**2.3**	**60**
DG-AT9	DG-AT9W	1/31/2019	<4.1	<2.9	**500**	<0.59	**0.22**	<0.70	<3.7	**3.5**	**8.5**	**17**	<0.10	<2.9	**6.8**	<4.6	<2.0	<3.5	<0.87	**380**
DG-AU3	DG-AU3W	12/20/2018	**9.0**	**100**	**120**	<0.59	<0.21	<0.70	<3.7	**2.4**	**7.7**	<2.2	<0.10	**15**	**2.8**	<4.6	<2.0	<3.5	**3.6**	**14**
DG-AU7	DG-AU7W	1/11/2019	<4.1	**61**	**98**	<0.59	<0.21	**1.1**	<3.7	**3.6**	**16**	**3.7**	<0.10	**3.5**	**3.6**	**5.0**	<2.0	**6.2**	<0.87	**52**
DG-AU7 (D)	DG-AU7 (D)W	1/11/2019	<4.1	**57**	**95**	<0.59	<0.21	**1.1**	<3.7	**4.2**	**12**	**11**	<0.10	**3**	**4.5**	<4.6	<2.0	<3.5	<0.87	**45**
DG-AV5	DG-AV5W	12/20/2018	**50**	**4300**	**62**	<0.59	**0.25**	**6.1**	<3.7	**6.5**	**8.6**	**7.8**	<0.10	**6.2**	**11**	<4.6	<2.0	**43**	**4.7**	**15**
DG-AV9	DG-AV9W	2/1/2019	<4.1	**4.0**	**110**	<0.59	**1.2**	**0.88**	<3.7	**2.9**	**15**	**28**	<0.10	<2.9	**12**	<4.6	<2.0	<3.5	<0.87	**430**
DG-AW11	DG-AW11W	1/24/2019	<4.1	<2.9	**36**	<0.59	<0.21	**1.2**	<3.7	<0.68	**4.6**	<2.2	<0.10	**5.1**	**1.1**	<4.6	<2.0	<3.5	**2.6**	<7.4
DG-AW11 (D)	DG-AW11 (D)W	1/24/2019	<4.1	**4.5**	**70**	<0.59	<0.21	**1.8**	<3.7	<0.68	<3.7	<2.2	<0.10	<2.9	<1.0	<4.6	<2.0	<3.5	<0.87	<7.4
DG-AW3	DG-AW3W	1/31/2019	<4.1	**67**	**180**	<0.59	<0.21	**1.4**	<3.7	**7.9**	**6.0**	**9.9**	<0.10	**5.0**	**7.9**	<4.6	<2.0	<3.5	**1.9**	<7.4
DG-AX5	DG-AX5W	12/20/2018	<4.1	**14**	**110**	<0.59	<0.21	**1.5**	<3.7	**2.1**	<3.7	<2.2	<0.10	**8.9**	**2.2**	**5.7**	<2.0	**6.8**	**2.3**	<7.4
DG-AY3	DG-AY3W	2/1/2019	<4.1	**38**	**85**	<0.59	<0.21	**5.3**	**5.8**	**4.3**	**13**	**11**	<0.10	**5.2**	**3.1**	<4.6	<2.0	<3.5	**2.1**	<7.4
DG-N1	DG-N1W	12/18/2018	<4.1	**12**	**51**	<0.59	<0.21	**0.85**	<3.7	**5.0**	**5.1**	**7.5**	<0.10	**4.6**	**8.4**	<4.6	<2.0	<3.5	**1.0**	<7.4
DG-N13	DG-N13W	1/11/2019	**4.9**	**3.3**	**38**	<0.59	<0.21	**0.98**	<3.7	**0.93**	**5.7**	<2.2	<0.10	**5.8**	**1.7**	<4.6	<2.0	**3.6**	<0.87	<7.4
DG-N13 (D)	DG-N13 (D)W	1/11/2019	<4.1	**5.6**	**37**	<0.59	<0.21	**1.7**	<3.7	**1.2**	**6.3**	<2.2	<0.10	**5.3**	**1.5**	<4.6	<2.0	<3.5	<0.87	<7.4

Table 7: Dissolved Metals Concentrations in Groundwater, A-Fill Water-Bearing Zone

UPC OU-2

Brisbane, California

Sample Location	Sample Name	Collection Date	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Chromium, Hexavalent	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
Aquatic Habitat Goal Saltwater Ecotox ESL [1]			5.0E+02	3.6E+01	-	-	9.3E+00	1.0E+03	5.0E+01	-	3.1E+00	8.1E+00	2.5E-02	-	8.2E+00	5.0E-01	1.9E-01	2.1E+02	-	8.1E+01
		Units	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
DG-N5	DG-N5W	1/10/2019	**4.4**	**63**	**220**	<0.59	**0.56**	**0.78**	<3.7	**3.2**	**13**	<2.2	<0.10	**19**	**2.8**	<4.6	<2.0	<3.5	**1.1**	**20**
DG-N9	DG-N9W	1/14/2019	<4.1	**42**	**67**	<0.59	<0.21	**1.0**	<3.7	**0.87**	**4.9**	<2.2	<0.10	<2.9	**1.6**	**7.2**	<2.0	<3.5	**1.1**	<7.4
DG-O11	DG-O11W	1/14/2019	<4.1	**11**	**34**	<0.59	<0.21	**2.0**	<3.7	<0.68	<3.7	<2.2	<0.10	<2.9	**1.2**	<4.6	<2.0	<3.5	**6.2**	<7.4
DG-O15	DG-O15W	1/11/2019	<4.1	**68**	**110**	<0.59	<0.21	**0.85**	<3.7	**2.9**	**4.4**	<2.2	**0.14**	**6.9**	**10**	<4.6	<2.0	<3.5	**3.1**	<7.4
DG-O3	DG-O3W	12/18/2018	<4.1	**36**	**40**	<0.59	<0.21	**0.93**	<3.7	**1.6**	<3.7	**6.8**	<0.10	**7.1**	**2.1**	<4.6	<2.0	<3.5	**1.5**	<7.4
DG-O7	DG-O7W	1/10/2019	<4.1	**9.0**	**75**	<0.59	<0.21	**1.9**	<3.7	**1.0**	**3.8**	<2.2	<0.10	**3.7**	**1.1**	<4.6	<2.0	**9.6**	**1.2**	<7.4
DG-P13	DG-P13W	1/11/2019	**6.6**	**3.8**	**42**	<0.59	<0.21	<0.70	<3.7	<0.68	**5.8**	<2.2	<0.10	**6.1**	<1.0	<4.6	<2.0	<3.5	**3.5**	<7.4
DG-P5	DG-P5W	1/10/2019	<4.1	**56**	**180**	<0.59	<0.21	**0.81**	<3.7	**1.6**	**5.4**	<2.2	<0.10	**10**	<1.0	<4.6	<2.0	**8.1**	<0.87	<7.4
DG-Q11	DG-Q11W	1/15/2019	**4.6**	**12**	**48**	<0.59	<0.21	**1.4**	<3.7	**0.9**	<3.7	<2.2	<0.10	**4.8**	<1.0	<4.6	<2.0	**8.1**	<0.87	<7.4
DG-Q11 (D)	DG-Q11 (D)W	1/15/2019	<4.1	**12**	**44**	<0.59	<0.21	**1.6**	<3.7	**0.77**	<3.7	<2.2	<0.10	**4.9**	<1.0	<4.6	<2.0	**5.8**	**1.0**	<7.4
DG-Q15	DG-Q15W	1/11/2019	<4.1	**12**	**88**	<0.59	<0.21	**1.6**	<3.7	**17**	**7.1**	<2.2	<0.10	**5.7**	**23**	<4.6	<2.0	<3.5	**3.3**	<7.4
DG-Q7	DG-Q7W	1/10/2019	<4.1	**7.4**	**980**	<0.59	<0.21	**1.1**	<3.7	<0.68	<3.7	**3.2**	<0.10	<2.9	<1.0	<4.6	<2.0	**4.4**	<0.87	**27**
DG-Q7 (D)	DG-Q7 (D)W	1/10/2019	<4.1	**4.0**	**1000**	<0.59	<0.21	**1.0**	<3.7	<0.68	<3.7	<2.2	<0.10	**2.9**	**1.1**	<4.6	<2.0	<3.5	<0.87	**28**
DG-R1	DG-R1W	12/17/2018	<4.1	**26**	**56**	<0.59	**0.23**	**0.81**	<3.7	**4.6**	**6.5**	**6.5**	<0.10	<2.9	**4.1**	<4.6	<2.0	<3.5	**1.0**	<7.4
DG-R13	DG-R13W	1/29/2019	**5.5**	**6.9**	**24**	<0.59	<0.21	**1.0**	<3.7	<0.68	<3.7	<2.2	<0.10	**4.4**	<1.0	<4.6	<2.0	<3.5	**0.91**	<7.4
DG-R5	DG-R5W	1/30/2019	**5.7**	**57**	**140**	<0.59	<0.21	<0.70	<3.7	**2.6**	<3.7	<2.2	<0.10	**14**	**1.7**	<4.6	<2.0	<3.5	<0.87	**14**
DG-R9	DG-R9W	1/25/2019	<4.1	**65**	**62**	<0.59	**0.25**	**1.7**	<3.7	<0.68	<3.7	<2.2	**0.12**	**43**	**2.9**	<4.6	<2.0	<3.5	<0.87	<7.4
DG-S11	DG-S11W	1/15/2019	**6.5**	**5.5**	**50**	**0.83**	**0.72**	<0.70	<3.7	**3.0**	<3.7	**9.0**	<0.10	**12**	**2.7**	<4.6	<2.0	<3.5	**2.2**	<7.4
DG-S15	DG-S15W	1/11/2019	<4.1	**7.6**	**38**	<0.59	<0.21	<0.70	<3.7	**0.73**	**4.9**	<2.2	<0.10	**5.3**	<1.0	<4.6	<2.0	<3.5	**1.3**	<7.4
DG-S15 (D)	DG-S15 (D)W	1/11/2019	<4.1	**3.3**	**38**	<0.59	<0.21	<0.70	<3.7	**1.0**	**4.2**	<2.2	<0.10	**5.5**	<1.0	<4.6	<2.0	<3.5	**1.9**	<7.4
DG-S3	DG-S3W	12/18/2018	<4.1	**24**	**110**	<0.59	<0.21	**0.79**	<3.7	**1.6**	<3.7	**12**	<0.10	**8.7**	**1.4**	<4.6	<2.0	<3.5	**2.0**	<7.4
DG-S7	DG-S7W	1/10/2019	<4.1	**8.4**	**660**	<0.59	<0.21	<0.70	<3.7	<0.68	**4.6**	<2.2	<0.10	**12**	**1.5**	<4.6	<2.0	<3.5	<0.87	<7.4
DG-T1	DG-T1W	12/17/2018	<4.1	**9.5**	**48**	**1.1**	**0.9**	**2.0**	<3.7	**7.5**	**4.8**	**6.7**	<0.10	**4.1**	**7.1**	<4.6	<2.0	<3.5	**1.6**	<7.4
DG-T13	DG-T13W	1/15/2019	<4.1	**8.4**	**92**	<0.59	<0.21	**1.0**	<3.7	<0.68	<3.7	<2.2	<0.10	**17**	<1.0	<4.6	<2.0	**4.4**	<0.87	<7.4
DG-T5	DG-T5W	1/7/2019	**9.2**	**120**	**310**	<0.59	<0.21	<0.70	<3.7	**1.5**	**8.0**	**14**	<0.10	**9.2**	<1.0	<4.6	<2.0	<3.5	**3.7**	**9.6**
DG-T9	DG-T9W	1/14/2019	<4.1	**16**	**690**	<0.59	<0.21	<0.70	<3.7	<0.68	<3.7	<2.2	<0.10	**5.7**	<1.0	**5.6**	<2.0	<3.5	<0.87	**13**
DG-U11	DG-U11W	1/15/2019	<4.1	**31**	**87**	<0.59	<0.21	**0.86**	<3.7	**0.68**	<3.7	<2.2	<0.10	**3.4**	<1.0	<4.6	<2.0	**6.4**	**1.3**	<7.4
DG-U15	DG-U15W	1/28/2019	<4.1	**3.8**	**49**	<0.59	<0.21	<0.70	<3.7	<0.68	<3.7	<2.2	**0.23**	**3.8**	**1.7**	<4.6	<2.0	<3.5	<0.87	<7.4
DG-U3	DG-U3W	12/18/2018	<4.1	**36**	**14**	<0.59	<0.21	<0.70	<3.7	<0.68	<3.7	**5.4**	<0.10	**11**	**1.4**	<4.6	<2.0	<3.5	<0.87	<7.4
DG-U3 (D)	DG-U3 (D)W	12/18/2018	<4.1	**38**	**15**	<0.59	<0.21	<0.70	<3.7	<0.68	<3.7	**4.3**	<0.10	**11**	**1.2**	<4.6	<2.0	<3.5	<0.87	<7.4
DG-U7	DG-U7W	1/10/2019	<4.1	**17**	**1000**	<0.59	<0.21	**0.73**	<3.7	<0.68	<3.7	<2.2	<0.10	**4.0**	<1.0	<4.6	<2.0	<3.5	<0.87	<7.4
DG-V1	DG-V1W	12/17/2018	<4.1	**12**	**49**	**0.61**	**0.41**	**1.4**	<3.7	**6.7**	<3.7	**7.4**	<0.10	<2.9	**6.4**	<4.6	<2.0	**3.7**	<0.87	<7.4
DG-V13	DG-V13W	1/15/2019	<4.1	**4.4**	**47**	<0.59	<0.21	**0.88**	<3.7	<0.68	**8.2**	<2.2	<0.10	<2.9	**1.7**	<4.6	<2.0	<3.5	**1.5**	**7.8**
DG-V17	DG-V17W	1/28/2019	**5.5**	<2.9	**61**	<0.59	<0.21	<0.70	<3.7	<0.68	<3.7	<2.2	<0.10	**5.8**	<1.0	**6.9**	<2.0	<3.5	<0.87	<7.4
DG-V5	DG-V5W	1/7/2019	**12**	**610**	**120**	<0.59	<0.21	<0.70	<3.7	<0.68	**6.1**	**9.2**	<0.10	**3.7**	<1.0	<4.6	<2.0	<3.5	**7.2**	**17**
DG-V9	DG-V9W	1/14/2019	<4.1	**3.8**	**330**	<0.59	**1.2**	**0.92**	<3.7	**6.3**	**7.6**	<2.2	<0.10	<2.9	**9.4**	**5.2**	<2.0	**4.3**	<0.87	**310**
DG-W15	DG-W15W	1/29/2019	<4.1	**4.2**	**48**	<0.59	<0.21	<0.70	<3.7	<0.68	<3.7	<2.2	<0.10	**7.7**	<1.0	<4.6	<2.0	<3.5	<0.87	<7.4
DG-W3	DG-W3W	12/18/2018	<4.1	**16**	**42**	<0.59	<0.21	<0.70	<3.7	**4.5**	**5.6**	**7.8**	<0.10	**3.1**	**4.0**	<4.6	<2.0	<3.5	<0.87	<7.4
DG-W7	DG-W7W	1/30/2019	<4.1	**4.3**	**210**	<0.59	<0.21	**0.89**	<3.7	**2.8**	<3.7	<2.2	<0.10	<2.9	**5.6**	<4.6	<2.0	<3.5	<0.87	**170**

Table 7: Dissolved Metals Concentrations in Groundwater, A-Fill Water-Bearing Zone

UPC OU-2

Brisbane, California

Sample Location	Sample Name	Collection Date	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Chromium, Hexavalent	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
Aquatic Habitat Goal Saltwater Ecotox ESL [1]			5.0E+02	3.6E+01	-	-	9.3E+00	1.0E+03	5.0E+01	-	3.1E+00	8.1E+00	2.5E-02	-	8.2E+00	5.0E-01	1.9E-01	2.1E+02	-	8.1E+01
		Units	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
DG-X1	DG-X1W	12/17/2018	<4.1	**11**	**59**	**0.59**	**0.72**	**1.7**	<3.7	**8.9**	**4.5**	**7.4**	<0.10	**5.3**	**9.2**	<4.6	<2.0	<3.5	**1.5**	<7.4
DG-X13	DG-X13W	1/25/2019	<4.1	<2.9	**110**	<0.59	<0.21	**1.1**	<3.7	<0.68	<3.7	<2.2	<0.10	**3.6**	<1.0	<4.6	<2.0	<3.5	<0.87	<7.4
DG-X17	DG-X17W	1/28/2019	**6.0**	**3.8**	**52**	<0.59	<0.21	<0.70	<3.7	<0.68	**4.7**	<2.2	<0.10	**3.5**	<1.0	<4.6	<2.0	<3.5	**1.5**	<7.4
DG-X5	DG-X5W	1/7/2019	**12**	**65**	**260**	<0.59	<0.21	**1.6**	<3.7	**0.96**	**12**	**28**	<0.10	**11**	**1.3**	<4.6	<2.0	<3.5	**2.7**	**17**
DG-X9	DG-X9W	1/14/2019	<4.1	<2.9	**310**	<0.59	<0.21	**0.75**	<3.7	<0.68	<3.7	<2.2	**0.28**	<2.9	**1.4**	<4.6	<2.0	<3.5	<0.87	**18**
DG-Y11	DG-Y11W	1/22/2019	<4.1	**4.1**	**910**	<0.59	<0.21	**2.3**	<3.7	**4.5**	**6.8**	<2.2	<0.10	<2.9	**100**	<4.6	<2.0	<3.5	**2.2**	**57**
DG-Y15	DG-Y15W	2/1/2019	<4.1	<2.9	**48**	<0.59	<0.21	<0.70	<3.7	<0.68	<3.7	**7.4**	<0.10	<2.9	<1.0	<4.6	<2.0	<3.5	<0.87	<7.4
DG-Y19	DG-Y19W	1/28/2019	<4.1	**20**	**390**	<0.59	<0.21	**3.9**	<3.7	<0.68	**20**	**59**	<0.10	<2.9	**2.0**	<4.6	<2.0	<3.5	**3.7**	**27**
DG-Y3	DG-Y3W	12/18/2018	<4.1	**24**	**79**	<0.59	<0.21	<0.70	<3.7	**9.4**	<3.7	**9.5**	<0.10	<2.9	**7.0**	<4.6	<2.0	<3.5	<0.87	**8.7**
DG-Y7	DG-Y7W	1/11/2019	<4.1	**4.1**	**170**	<0.59	<0.21	<0.70	<3.7	**0.9**	**6.1**	<2.2	<0.10	<2.9	**2.0**	<4.6	<2.0	**9.5**	<0.87	**75**
DG-Z17	DG-Z17W	1/28/2019	<4.1	<2.9	**96**	**0.82**	**0.45**	**1.0**	<3.7	**0.68**	<3.7	**8.8**	<0.10	**2.9**	**1.3**	<4.6	<2.0	<3.5	**1.5**	<7.4
DG-Z5	DG-Z5W	1/7/2019	<4.1	**22**	**120**	<0.59	<0.21	**1.4**	<3.7	**5.9**	<3.7	**9.2**	<0.10	**7.6**	**3.7**	<4.6	<2.0	<3.5	<0.87	<7.4
DG-Z9	DG-Z9W	1/15/2019	<4.1	**4.2**	**390**	<0.59	**0.47**	**2.1**	<3.7	**5.9**	**4.9**	**5.5**	<0.10	**13**	**7.5**	<4.6	<2.0	**19**	<0.87	**170**
KMW-4A	KMW-4AW	12/18/2018	<2.7	**43**	**110**	<0.33	<1.3	<1.5	<3.7	**12**	<1.5	**9.2**	<0.10	<2.3	**12**	<7.1	<1.2	<3.5	<0.70	<9.6
KMW-7A	KMW-7AW	12/19/2018	<2.7	**41**	**170**	<0.33	<1.3	<1.5	<3.7	**8.7**	<1.5	<2.3	<0.10	<2.3	**11**	<7.1	<1.2	<3.5	<0.70	<9.6
LF-3A	LF-3AW	12/18/2018	<2.7	<2.6	**47**	<0.33	<1.3	<1.5	<3.7	<1.2	<1.5	**12**	<0.10	<2.3	<0.80	<7.1	<1.2	<3.5	<0.70	<9.6
LF-3A (D)	LF-3A (D)W	12/18/2018	<2.7	<2.6	**48**	<0.33	<1.3	<1.5	<3.7	<1.2	<1.5	**14**	<0.10	<2.3	<0.80	<7.1	<1.2	<3.5	<0.70	<9.6
LF-4A	LF-4AW	12/18/2018	<2.7	**390**	**2400**	<0.33	<1.3	<1.5	**12**	<1.2	**74**	**30**	<0.10	<2.3	**48**	<7.1	<1.2	<3.5	<0.70	<9.6
LF-5A	LF-5AW	12/19/2018	<2.7	<2.6	**720**	<0.33	<1.3	<1.5	<3.7	<1.2	<1.5	<2.3	<0.10	<2.3	<0.80	<7.1	<1.2	<3.5	<0.70	<9.6
LF-7A	LF-7AW	12/19/2018	<2.7	<2.6	**580**	<0.33	<1.3	<1.5	<3.7	<1.2	<1.5	<2.3	<0.10	<2.3	<0.80	<7.1	<1.2	<3.5	<0.70	**55**
LF-8A	LF-8AW	12/19/2018	<2.7	**13**	**1800**	<0.33	<1.3	<1.5	**14**	<1.2	<1.5	**9.4**	<0.10	<2.3	<0.80	<7.1	<1.2	<3.5	<0.70	<9.6
MK-2A	MK-2AW	12/18/2018	<2.7	<2.6	**1400**	<0.33	<1.3	<1.5	<3.7	**380**	<1.5	**120**	<0.10	<2.3	**230**	<28	<4.8	<14	**32**	<9.6
MK-7A	MK-7AW	12/19/2018	<2.7	<2.6	**320**	<0.33	<1.3	<1.5	<3.7	**2.1**	**25**	<2.3	<0.10	<2.3	<0.80	<7.1	<1.2	<3.5	<0.70	**88**
MK-8A	MK-8AW	12/19/2018	<2.7	<2.6	**52**	<0.33	<1.3	<1.5	<3.7	<1.2	**23**	<2.3	<0.10	<2.3	**19**	<7.1	<1.2	<3.5	<0.70	**670**
MW-10A	MW-10AW	12/19/2018	<2.7	**64**	**93**	<0.33	<1.3	<1.5	<3.7	**4.3**	<1.5	<2.3	<0.10	<2.3	<0.80	<7.1	<1.2	<3.5	<0.70	<9.6
MW-11AR	MW-11ARW	12/18/2018	<2.7	**26**	**65**	<0.33	<1.3	<1.5	<3.7	**4.8**	<1.5	**7.8**	<0.10	<2.3	<0.80	<7.1	<1.2	<3.5	<0.70	<9.6
MW-13A	MW-13AW	12/18/2018	<2.7	<2.6	**96**	<0.33	<1.3	<1.5	<3.7	**3.3**	<1.5	**8.8**	<0.10	<2.3	<0.80	<7.1	<1.2	<3.5	<0.70	<9.6
MW-15A	MW-15AW	12/18/2018	<2.7	<2.6	**550**	<0.33	<1.3	<1.5	<3.7	<1.2	<1.5	**16**	<0.10	<2.3	**42**	<7.1	<1.2	<3.5	<0.70	<9.6
MW-17A	MW-17AW	12/18/2018	<2.7	<2.6	**97**	<0.33	<1.3	<1.5	<3.7	<1.2	<1.5	**8.5**	<0.10	<2.3	<0.80	<7.1	<1.2	<3.5	<0.70	<9.6
MW-17A (D)	MW-17A (D)W	12/18/2018	<2.7	<2.6	**100**	<0.33	<1.3	<1.5	<3.7	<1.2	<1.5	**11**	<0.10	<2.3	<0.80	<7.1	<1.2	<3.5	<0.70	<9.6
MW-9A	MW-9AW	12/18/2018	<2.7	<2.6	**93**	<0.33	<1.3	<1.5	<3.7	<1.2	<1.5	**13**	<0.10	<2.3	<0.80	<7.1	<1.2	<3.5	<0.70	<9.6

Table 7: Dissolved Metals Concentrations in Groundwater,
A-Fill Water-Bearing Zone
UPC OU-2
Brisbane, California

Notes:

1. San Francisco Bay RWQCB, 2019. Summary of Groundwater ESLs, Jan. 2019 (Rev. 1) - Aquatic Habitat Goal Levels (Table GW-2): Saltwater Ecotox.
2. Metals were analyzed by USEPA Methods 6010B, 7196, and 7471A.
3. Non-detect results are presented with "<" followed by the MDL.
4. Results in bold font indicate a detection above the MDL.
5. Gray shading indicates a detection above the comparison criteria.

Abbreviations and Symbols:

"<" - Non-detect result
µg/L - microgram per liter
(D) - Duplicate sample
MDL - Method Detection Limit
R - Result rejected during data validation
RWQCB - Regional Water Quality Control Board
USEPA - United States Environmental Protection Agency

Table 8: Polynuclear Aromatic Hydrocarbons in Groundwater, A-Fill Water-Bearing Zone

UPC OU-2

Brisbane, California

Sample Location	Sample Date	Collection Date	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenzo(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Naphthalene	Nitrobenzene	Phenanthrene	Pyrene
Aquatic Habitat Goal Levels Saltwater Ecotox ESL [1]			1.5E+01	1.5E+01	1.5E+01	1.5E+01	1.5E+01	1.5E+01	1.5E+01	1.5E+01	1.5E+01	8.0E+00	1.5E+01	1.5E+01	1.5E+01	--	4.6E+00	1.5E+01
Units			µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
DG-AA11	DG-AA11W	1/30/2019	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	**4.3**	<1.1	**1.9**	**3.9**	**3.5**	<1.1
DG-AA15	DG-AA15W	1/25/2019	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	**0.16**	<0.10	**0.13**
DG-AA19	DG-AA19W	1/25/2019	<0.52	<0.52	<0.52	<0.52	<0.52	<0.52	<0.52	<0.52	<0.52	<0.52	<0.52	<0.52	**1.7**	**2.8**	**2.4**	<0.52
DG-AA3	DG-AA3W	12/18/2018	<0.10	<0.10	<0.10	**0.11**	**0.16**	**0.10**	<0.10	**0.11**	<0.10	**0.19**	<0.10	<0.10	<0.10	<0.10	**0.19**	**0.27**
DG-AA7	DG-AA7W	1/11/2019	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
DG-AB13	DG-AB13W	1/25/2019	<0.10	**0.21**	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	**0.17**	<0.10	<0.10	**0.23**	**0.40**	**0.21**
DG-AB13 (D)	DG-AB13 (D)W	1/25/2019	<0.10	**0.14**	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	**0.14**	**0.12**	**0.12**
DG-AB17	DG-AB17W	1/25/2019	**0.18**	**0.22**	<0.11	<0.11	<0.11	<0.11	<0.11	**0.12**	<0.11	**0.5**	**0.14**	<0.11	**0.25**	**4.4**	**0.32**	**0.53**
DG-AB5	DG-AB5W	1/31/2019	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
DG-AB5 (D)	DG-AB5 (D)W	1/31/2019	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
DG-AC15	DG-AC15W	2/1/2019	**0.24**	**0.55**	**0.77**	**1.5**	**1.3**	**1.5**	**0.38**	**1.1**	<0.20	**3.7**	**1.3**	**1.2**	**8.2**	**0.56**	**1.5**	**4.3**
DG-AC3	DG-AC3W	12/19/2018	<0.10	<0.10	**0.16**	**0.36**	**0.38**	**0.5**	**0.11**	**0.23**	<0.10	**0.46**	<0.10	**0.4**	<0.10	<0.10	**0.16**	**0.7**
DG-AC7	DG-AC7W	1/11/2019	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
DG-AC7 (D)	DG-AC7 (D)W	1/11/2019	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
DG-AD13	DG-AD13W	2/1/2019	<1.0	**1.2**	<1.0	<1.0	<1.0	<1.0	<1.0	**1.3**	<1.0	<1.0	**3.6**	<1.0	**17**	**1.5**	**5.6**	**2.3**
DG-AD13 (D)	DG-AD13 (D)W	2/1/2019	<0.50	**0.8**	<0.50	<0.50	<0.50	<0.50	<0.50	**0.97**	<0.50	<0.50	**2.5**	<0.50	**27**	**1.3**	**3.8**	**1.4**
DG-AD17	DG-AD17W	1/25/2019	<0.11	**0.56**	**0.16**	<0.11	**0.14**	<0.11	<0.11	**0.21**	<0.11	**1.6**	**1.3**	<0.11	**1.2**	**5.3**	**1.6**	**0.79**
DG-AD5	DG-AD5W	1/7/2019	<0.099	**0.14**	**0.5**	**1.3**	**1.3**	**1.4**	**0.32**	**0.70**	<0.099	**2.9**	<0.099	**1.0**	**0.13**	<0.099	**0.15**	**2.7**
DG-AD9	DG-AD9W	1/11/2019	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
DG-AE11	DG-AE11W	1/22/2019	<1.0	**2.2**	<1.0	<1.0	<1.0	<1.0	<1.0	**1.5**	<1.0	**1.0**	**5.5**	<1.0	**4.3**	**3.0**	**10**	**4.2**
DG-AE3	DG-AE3W	12/19/2018	<0.10	<0.10	**0.12**	**0.19**	**0.22**	**0.24**	<0.10	**0.15**	<0.10	**0.31**	<0.10	**0.19**	<0.10	<0.10	**0.18**	**0.39**
DG-AE7	DG-AE7W	1/11/2019	<0.11	<0.11	**0.22**	**0.25**	**0.30**	**0.26**	**0.14**	**0.18**	<0.11	**0.47**	<0.11	**0.22**	<0.11	<0.11	**0.14**	**0.42**
DG-AF5	DG-AF5W	1/7/2019	<0.10	**0.13**	**0.29**	**0.45**	**0.49**	**0.47**	**0.19**	**0.36**	<0.10	**0.69**	<0.10	**0.38**	**0.11**	<0.10	**0.36**	**0.89**
DG-AG11	DG-AG11W	1/22/2019	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	<2.1	**2.7**	**5.6**	<2.1	<2.1	**2.3**	**10**	**5.2**
DG-AG15	DG-AG15W	1/24/2019	<2.9	<2.9	<2.9	<2.9	<2.9	<2.9	<2.9	<2.9	<2.9	<2.9	<2.9	<2.9	<2.9	<2.9	<2.9	<2.9
DG-AG3	DG-AG3W	12/19/2018	<0.51	<0.51	<0.51	<0.51	<0.51	<0.51	<0.51	<0.51	<0.51	<0.51	<0.51	<0.51	<0.51	<0.51	<0.51	<0.51
DG-AG7	DG-AG7W	1/31/2019	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
DG-AH13	DG-AH13W	1/29/2019	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
DG-AH5	DG-AH5W	1/7/2019	<0.099	<0.099	<0.099	<0.099	**0.12**	**0.11**	<0.099	<0.099	<0.099	**0.17**	<0.099	<0.099	<0.099	<0.099	**0.14**	**0.23**
DG-AI15	DG-AI15W	1/25/2019	<0.52	<0.52	<0.52	<0.52	<0.52	<0.52	<0.52	<0.52	<0.52	<0.52	<0.52	<0.52	**11**	<0.52	<0.52	<0.52
DG-AI3	DG-AI3W	12/19/2018	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099
DG-AI3 (D)	DG-AI3 (D)W	12/19/2018	**0.13**	**0.17**	**0.12**	**0.20**	**0.29**	**0.28**	**0.098**	**0.19**	<0.096	**0.46**	<0.096	**0.20**	**0.32**	<0.096	**0.36**	**0.69**
DG-AI7	DG-AI7W	1/11/2019	<0.11	<0.11	<0.11	<0.11	<0.11	**0.13**	<0.11	<0.11	<0.11	**0.15**	<0.11	<0.11	<0.11	<0.11	<0.11	**0.16**
DG-AJ13	DG-AJ13W	1/29/2019	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
DG-AJ5	DG-AJ5W	1/7/2019	**0.3**	**0.29**	**0.8**	**1.7**	**2.00**	**2.5**	**0.57**	**1.2**	<0.20	**3.7**	<0.20	**1.9**	**0.83**	<0.20	**1.2**	**3.6**
DG-AK11	DG-AK11W	1/29/2019	<2.0	**2.2**	<2.0	**2.3**	**2.4**	**2.4**	<2.0	**3.3**	<2.0	**4.0**	**4.8**	<2.0	**3.1**	**2.2**	**8.3**	**5.7**

Table 8: Polynuclear Aromatic Hydrocarbons in Groundwater, A-Fill Water-Bearing Zone

UPC OU-2

Brisbane, California

Sample Location	Sample Date	Collection Date	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenzo(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Naphthalene	Nitrobenzene	Phenanthrene	Pyrene
Aquatic Habitat Goal Levels Saltwater Ecotox ESL [1]			1.5E+01	1.5E+01	1.5E+01	1.5E+01	1.5E+01	1.5E+01	1.5E+01	1.5E+01	1.5E+01	8.0E+00	1.5E+01	1.5E+01	1.5E+01	--	4.6E+00	1.5E+01
		Units	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
DG-AK15	DG-AK15W	1/24/2019	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	**41**	<25	<25	<25
DG-AK3	DG-AK3W	12/19/2018	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	**0.11**	<0.099	<0.099	<0.099	<0.099	**0.15**	**0.13**
DG-AK7	DG-AK7W	1/11/2019	<0.11	<0.11	<0.11	**0.12**	**0.16**	**0.24**	<0.11	**0.11**	<0.11	**0.21**	<0.11	**0.16**	<0.11	<0.11	<0.11	**0.23**
DG-AK7 (D)	DG-AK7 (D)W	1/11/2019	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
DG-AL13	DG-AL13W	1/29/2019	<0.41	<0.41	<0.41	<0.41	<0.41	<0.41	<0.41	<0.41	<0.41	<0.41	<0.41	<0.41	<0.41	<0.41	<0.41	<0.41
DG-AL5	DG-AL5W	1/31/2019	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
DG-AL9	DG-AL9W	1/22/2019	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
DG-AM15	DG-AM15W	1/24/2019	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
DG-AM3	DG-AM3W	12/19/2018	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
DG-AM7	DG-AM7W	1/11/2019	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	**0.14**	<0.11	<0.11	<0.11	<0.11	<0.11	**0.15**
DG-AN13	DG-AN13W	2/1/2019	<0.52	<0.52	<0.52	<0.52	<0.52	<0.52	<0.52	<0.52	<0.52	<0.52	<0.52	<0.52	<0.52	<0.52	<0.52	<0.52
DG-AN5	DG-AN5W	12/20/2018	<0.099	<0.099	**0.33**	**0.46**	**0.65**	**0.44**	**0.21**	**0.41**	<0.099	**0.70**	<0.099	**0.38**	**0.11**	<0.099	**0.47**	**0.69**
DG-AN9	DG-AN9W	1/21/2019	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
DG-AO3	DG-AO3W	12/19/2018	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
DG-AO7	DG-AO7W	1/11/2019	<0.10	<0.10	<0.10	<0.10	**0.1**	<0.10	<0.10	<0.10	<0.10	**0.11**	<0.10	<0.10	<0.10	<0.10	<0.10	**0.13**
DG-AP5	DG-AP5W	12/20/2018	<0.099	<0.099	<0.099	**0.11**	**0.16**	<0.099	<0.099	**0.12**	<0.099	**0.22**	<0.099	<0.099	<0.099	<0.099	**0.15**	**0.22**
DG-AP9	DG-AP9W	1/21/2019	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
DG-AQ11	DG-AQ11W	1/31/2019	<0.51	<0.51	<0.51	<0.51	<0.51	<0.51	<0.51	<0.51	<0.51	<0.51	<0.51	<0.51	<0.51	<0.51	<0.51	<0.51
DG-AQ3	DG-AQ3W	12/19/2018	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
DG-AQ7	DG-AQ7W	1/31/2019	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
DG-AR5	DG-AR5W	12/20/2018	<0.098	<0.098	**0.10**	**0.11**	**0.13**	<0.098	<0.098	**0.10**	<0.098	**0.17**	<0.098	<0.098	<0.098	<0.098	**0.12**	**0.19**
DG-AR9	DG-AR9W	1/11/2019	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	**0.20**	<0.11	<0.11	<0.11	<0.11	<0.11	**0.23**
DG-AR9 (D)	DG-AR9 (D)W	1/11/2019	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
DG-AS11	DG-AS11W	1/31/2019	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
DG-AS3	DG-AS3W	12/20/2018	**0.4**	**0.18**	**1.1**	**2.1**	**2.2**	**1.2**	**0.71**	**1.8**	**0.30**	**1.2**	<0.10	**0.99**	**0.55**	<0.10	**0.63**	**2.8**
DG-AS3 (D)	DG-AS3 (D)W	12/20/2018	**0.38**	**0.19**	**1.2**	**2.0**	**2.2**	**1.1**	**0.77**	**1.8**	**0.23**	**1.2**	<0.10	**0.99**	**0.41**	<0.10	**0.59**	**2.8**
DG-AS7	DG-AS7W	1/11/2019	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
DG-AT5	DG-AT5W	12/20/2018	**0.19**	**0.18**	**0.78**	**0.84**	**0.93**	**0.55**	**0.38**	**0.84**	**0.16**	**1.1**	<0.10	**0.55**	<0.10	<0.10	**0.52**	**1.3**
DG-AT9	DG-AT9W	1/31/2019	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
DG-AU3	DG-AU3W	12/20/2018	**0.29**	**0.18**	**0.82**	**1.2**	**1.4**	**0.77**	**0.43**	**1.1**	**0.17**	**1.1**	**0.14**	**0.65**	**0.79**	<0.10	**0.88**	**1.7**
DG-AU7	DG-AU7W	1/11/2019	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
DG-AU7 (D)	DG-AU7 (D)W	1/11/2019	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
DG-AV5	DG-AV5W	12/20/2018	**0.11**	**0.34**	**0.19**	**0.20**	**0.33**	**0.19**	<0.10	**0.24**	<0.10	**0.67**	<0.10	**0.12**	**0.19**	<0.10	**0.30**	**0.6**
DG-AV9	DG-AV9W	2/1/2019	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	**0.13**	<0.10	<0.10	<0.10	<0.10	<0.10	**0.15**
DG-AW11	DG-AW11W	1/24/2019	<0.10	<0.10	**0.14**	**0.20**	**0.19**	**0.21**	<0.10	**0.17**	<0.10	**0.43**	<0.10	**0.21**	<0.10	<0.10	**0.15**	**0.55**
DG-AW11 (D)	DG-AW11 (D)W	1/24/2019	<0.10	<0.10	**0.14**	**0.20**	**0.19**	**0.22**	<0.10	**0.16**	<0.10	**0.36**	<0.10	**0.22**	<0.10	<0.10	**0.12**	**0.46**

Table 8: Polynuclear Aromatic Hydrocarbons in Groundwater, A-Fill Water-Bearing Zone

UPC OU-2

Brisbane, California

Sample Location	Sample Date	Collection Date	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenzo(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Naphthalene	Nitrobenzene	Phenanthrene	Pyrene
Aquatic Habitat Goal Levels Saltwater Ecotox ESL [1]			1.5E+01	1.5E+01	1.5E+01	1.5E+01	1.5E+01	1.5E+01	1.5E+01	1.5E+01	1.5E+01	8.0E+00	1.5E+01	1.5E+01	1.5E+01	--	4.6E+00	1.5E+01
Units			µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
DG-AW3	DG-AW3W	1/31/2019	**0.60**	**0.33**	**0.99**	**1.9**	**2.0**	**1.6**	**0.62**	**1.7**	**0.31**	**1.2**	<0.10	**1.2**	**1.1**	<0.10	**0.59**	**2.5**
DG-AX5	DG-AX5W	12/20/2018	<0.099	<0.099	<0.099	**0.13**	**0.16**	<0.099	<0.099	**0.12**	<0.099	**0.23**	<0.099	<0.099	<0.099	<0.099	**0.16**	**0.5**
DG-AY3	DG-AY3W	2/1/2019	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
DG-N1	DG-N1W	12/18/2018	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	**0.20**	<0.10
DG-N13	DG-N13W	1/11/2019	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099
DG-N13 (D)	DG-N13 (D)W	1/11/2019	<0.097	<0.097	<0.097	<0.097	<0.097	<0.097	<0.097	**0.11**	<0.097	**0.13**	**0.12**	<0.097	**0.35**	<0.097	**0.54**	**0.18**
DG-N5	DG-N5W	1/10/2019	<0.11	<0.11	**0.26**	**0.24**	**0.35**	**0.20**	**0.16**	**0.24**	<0.11	**0.46**	<0.11	**0.19**	**0.11**	<0.11	**0.21**	**0.46**
DG-N9	DG-N9W	1/14/2019	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	**0.11**	<0.11	<0.11	<0.11	<0.11	<0.11	**0.2**
DG-O11	DG-O11W	1/14/2019	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	**0.12**
DG-O15	DG-O15W	1/11/2019	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099
DG-O3	DG-O3W	12/18/2018	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
DG-O7	DG-O7W	1/10/2019	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	**0.10**	<0.10	<0.10	<0.10	<0.10	<0.10	**0.12**
DG-P13	DG-P13W	1/11/2019	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
DG-P5	DG-P5W	1/10/2019	<0.098	<0.098	<0.098	<0.098	<0.098	<0.098	<0.098	<0.098	<0.098	<0.098	<0.098	<0.098	<0.098	<0.098	<0.098	<0.098
DG-Q11	DG-Q11W	1/15/2019	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
DG-Q11 (D)	DG-Q11 (D)W	1/15/2019	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
DG-Q15	DG-Q15W	1/11/2019	<0.097	<0.097	<0.097	<0.097	<0.097	<0.097	<0.097	**0.11**	<0.097	<0.097	<0.097	<0.097	**0.16**	<0.097	**0.34**	<0.097
DG-Q7	DG-Q7W	1/10/2019	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
DG-Q7 (D)	DG-Q7 (D)W	1/10/2019	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
DG-R1	DG-R1W	12/17/2018	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	**0.14**
DG-R13	DG-R13W	1/29/2019	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
DG-R5	DG-R5W	1/30/2019	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	**0.32**	<0.10	**0.14**	**0.27**	**0.41**	**0.12**
DG-R9	DG-R9W	1/25/2019	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
DG-S11	DG-S11W	1/15/2019	<0.22	<0.22	<0.22	**0.30**	**0.42**	**0.29**	<0.22	**0.31**	<0.22	**0.42**	<0.22	<0.22	**0.23**	<0.22	**0.31**	**0.55**
DG-S15	DG-S15W	1/11/2019	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
DG-S15 (D)	DG-S15 (D)W	1/11/2019	<0.097	<0.097	<0.097	<0.097	<0.097	<0.097	<0.097	<0.097	<0.097	<0.097	<0.097	<0.097	<0.097	<0.097	<0.097	<0.097
DG-S3	DG-S3W	12/18/2018	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	**0.11**	<0.099
DG-S7	DG-S7W	1/10/2019	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
DG-T1	DG-T1W	12/17/2018	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	**0.15**	**0.23**
DG-T13	DG-T13W	1/15/2019	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13
DG-T5	DG-T5W	1/7/2019	<0.99	<0.99	<0.99	<0.99	<0.99	<0.99	<0.99	<0.99	<0.99	<0.99	<0.99	<0.99	<0.99	<0.99	<0.99	<0.99
DG-T9	DG-T9W	1/14/2019	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
DG-U11	DG-U11W	1/15/2019	**0.38**	**2.2**	**0.52**	**0.20**	**0.27**	<0.11	**0.14**	**0.51**	<0.11	**3.2**	**3.7**	<0.11	**0.26**	**0.77**	**9.8**	**1.9**
DG-U15	DG-U15W	1/28/2019	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	**0.2**	<0.20	<0.20	<0.20	<0.20	<0.20	**0.39**
DG-U3	DG-U3W	12/18/2018	<0.20	**0.36**	<0.20	**0.26**	**0.46**	**0.24**	<0.20	**0.46**	<0.20	**0.73**	<0.20	<0.20	**1.5**	**0.25**	**1.5**	**0.77**
DG-U3 (D)	DG-U3 (D)W	12/18/2018	<0.20	**0.34**	<0.20	**0.23**	**0.46**	**0.21**	<0.20	**0.43**	<0.20	**0.64**	<0.20	<0.20	**0.87**	**0.30**	**1.1**	**0.67**

Table 8: Polynuclear Aromatic Hydrocarbons in Groundwater, A-Fill Water-Bearing Zone

UPC OU-2

Brisbane, California

Sample Location	Sample Date	Collection Date	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenzo(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Naphthalene	Nitrobenzene	Phenanthrene	Pyrene
Aquatic Habitat Goal Levels Saltwater Ecotox ESL [1]			1.5E+01	1.5E+01	1.5E+01	1.5E+01	1.5E+01	1.5E+01	1.5E+01	1.5E+01	1.5E+01	8.0E+00	1.5E+01	1.5E+01	1.5E+01	--	4.6E+00	1.5E+01
		Units	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
DG-U7	DG-U7W	1/10/2019	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099
DG-V1	DG-V1W	12/17/2018	<0.099	<0.099	<0.099	<0.099	**0.13**	**0.13**	<0.099	<0.099	<0.099	**0.11**	<0.099	<0.099	<0.099	<0.099	**0.11**	**0.51**
DG-V13	DG-V13W	1/15/2019	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	**0.22**	<0.22	<0.22	<0.22	<0.22	<0.22	**0.31**
DG-V17	DG-V17W	1/28/2019	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
DG-V5	DG-V5W	1/7/2019	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099
DG-V9	DG-V9W	1/14/2019	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
DG-W15	DG-W15W	1/29/2019	**0.43**	**0.12**	<0.10	**0.12**	**0.12**	**0.25**	<0.10	<0.10	<0.10	**0.49**	<0.10	**0.17**	**0.13**	**0.38**	**0.17**	**0.47**
DG-W3	DG-W3W	12/18/2018	<0.10	**0.16**	**0.18**	**0.26**	**0.29**	**0.24**	<0.10	**0.22**	<0.10	**1.3**	<0.10	**0.17**	<0.10	**0.14**	**0.48**	**1.4**
DG-W7	DG-W7W	1/30/2019	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
DG-X1	DG-X1W	12/17/2018	<0.099	<0.099	**0.12**	**0.51**	**0.47**	**0.88**	**0.14**	**0.19**	<0.099	**0.32**	<0.099	**0.64**	<0.099	<0.099	**0.23**	**0.69**
DG-X13	DG-X13W	1/25/2019	**0.19**	**0.11**	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	**0.42**	<0.10	<0.10	**0.61**	**0.33**	**0.13**
DG-X17	DG-X17W	1/28/2019	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	**1.1**	<1.1	<1.1	<1.1	<1.1	<1.1	**1.7**
DG-X5	DG-X5W	1/7/2019	**0.29**	**0.37**	**0.89**	**1.3**	**1.3**	**1.2**	**0.53**	**0.95**	<0.20	**1.6**	<0.20	**0.89**	**0.25**	<0.20	**1.1**	**2.1**
DG-X9	DG-X9W	1/14/2019	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
DG-Y11	DG-Y11W	1/22/2019	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**3.1**	<1.0	<1.0	**3.2**	**4.7**	<1.0
DG-Y15	DG-Y15W	2/1/2019	**0.64**	**0.16**	<0.10	<0.10	<0.10	<0.10	<0.10	**0.22**	<0.10	**0.26**	**0.82**	<0.10	**0.29**	**1.6**	**0.28**	**0.58**
DG-Y19	DG-Y19W	1/28/2019	**0.19**	**0.42**	**0.44**	**0.41**	**0.39**	**0.21**	**0.14**	**0.52**	<0.099	**0.89**	**0.33**	**0.21**	**0.32**	**0.29**	**1.5**	**1.1**
DG-Y3	DG-Y3W	12/18/2018	<0.10	**0.15**	**0.29**	**0.72**	**0.76**	**0.78**	**0.24**	**0.41**	<0.10	**1.2**	<0.10	**0.63**	**0.16**	**0.15**	**0.53**	**1.5**
DG-Y7	DG-Y7W	1/11/2019	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
DG-Z17	DG-Z17W	1/28/2019	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	**0.35**	**0.26**	<0.10
DG-Z5	DG-Z5W	1/7/2019	**0.12**	**0.15**	**0.26**	**0.83**	**0.83**	**1.1**	**0.29**	**0.38**	<0.099	**0.75**	<0.099	**0.79**	**0.38**	<0.099	**0.28**	**0.96**
DG-Z9	DG-Z9W	1/15/2019	<0.11	<0.11	<0.11	**0.16**	**0.24**	**0.42**	<0.11	**0.17**	<0.11	**0.37**	<0.11	**0.25**	<0.11	<0.11	**0.13**	**0.41**
KMW-4A	KMW-4AW	12/18/2018	<0.41	<0.28	<0.62	<0.95	<0.32	<0.36	<0.29	<0.95	<0.38	<0.95	<0.46	<0.37	<0.95	<0.27	<0.32	<0.30
KMW-7A	KMW-7AW	12/19/2018	<0.41	<0.28	<0.62	<0.95	<0.32	<0.36	<0.29	<0.95	<0.38	<0.95	<0.46	<0.37	<0.95	<0.27	<0.32	<0.30
LF-3A	LF-3AW	12/18/2018	<0.41	<0.28	<0.62	<0.95	<0.32	<0.36	<0.29	<0.95	<0.38	<0.95	<0.47	<0.37	<0.95	<0.27	<0.32	<0.30
LF-3A (D)	LF-3A (D)W	12/18/2018	<0.41	<0.28	<0.62	<0.95	<0.32	<0.36	<0.29	<0.95	<0.38	<0.95	<0.47	<0.37	<0.95	<0.27	<0.32	<0.30
LF-4A	LF-4AW	12/18/2018	<0.42	<0.29	<0.64	<0.98	<0.33	<0.37	<0.30	<0.98	<0.39	<0.98	<0.48	<0.38	<0.98	<0.28	<0.34	<0.31
LF-5A	LF-5AW	12/19/2018	<0.41	<0.28	<0.62	<0.96	<0.33	<0.36	<0.30	<0.96	<0.38	<0.96	<0.47	<0.37	<0.96	<0.27	<0.33	<0.30
LF-7A	LF-7AW	12/19/2018	<0.41	<0.28	<0.62	<0.95	<0.32	<0.36	<0.30	<0.95	<0.38	<0.95	<0.47	<0.37	<0.95	<0.27	<0.33	<0.30
LF-8A	LF-8AW	12/19/2018	<0.42	<0.28	<0.63	<0.97	<0.33	<0.37	<0.30	<0.97	<0.39	<0.97	<0.48	<0.38	<0.97	<0.27	<0.33	<0.31
MK-2A	MK-2AW	12/18/2018	<0.41	<0.28	<0.62	<0.95	<0.32	<0.36	<0.29	<0.95	<0.38	<0.95	<0.46	<0.37	<0.95	<0.27	<0.32	<0.30
MK-7A	MK-7AW	12/19/2018	<0.42	<0.28	<0.63	<0.97	<0.33	<0.37	<0.30	<0.97	<0.39	<0.97	<0.47	<0.38	<0.97	<0.27	<0.33	<0.31
MK-8A	MK-8AW	12/19/2018	<0.42	<0.28	<0.63	<0.97	<0.33	<0.37	<0.30	<0.97	<0.39	<0.97	<0.48	<0.38	<0.97	<0.27	<0.33	<0.31
MW-10A	MW-10AW	12/19/2018	<0.42	<0.28	<0.63	<0.97	<0.33	<0.36	<0.30	<0.97	<0.39	<0.97	<0.47	<0.38	<0.97	<0.27	<0.33	<0.31
MW-11AR	MW-11ARW	12/18/2018	<0.41	<0.28	<0.62	<0.95	<0.32	<0.36	<0.30	<0.95	<0.38	<0.95	<0.47	<0.37	<0.95	<0.27	<0.32	<0.30
MW-13A	MW-13AW	12/18/2018	<0.42	<0.28	<0.63	<0.97	<0.33	<0.37	<0.30	<0.97	<0.39	<0.97	<0.48	<0.38	<0.97	<0.27	<0.33	<0.31

Table 8: Polynuclear Aromatic Hydrocarbons in Groundwater, A-Fill Water-Bearing Zone

UPC OU-2

Brisbane, California

Sample Location	Sample Date	Collection Date	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenzo(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Naphthalene	Nitrobenzene	Phenanthrene	Pyrene
Aquatic Habitat Goal Levels Saltwater Ecotox ESL [1]			1.5E+01	1.5E+01	1.5E+01	1.5E+01	1.5E+01	1.5E+01	1.5E+01	1.5E+01	1.5E+01	8.0E+00	1.5E+01	1.5E+01	1.5E+01	--	4.6E+00	1.5E+01
Units			µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
MW-15A	MW-15AW	12/18/2018	<0.44	<0.30	<0.67	<1.0	<0.35	<0.39	<0.32	<1.0	<0.41	<1.0	<0.51	<0.40	<1.0	<0.29	<0.35	<0.33
MW-17A	MW-17AW	12/18/2018	<0.42	<0.29	<0.64	<0.98	<0.33	<0.37	<0.30	<0.98	<0.39	<0.98	<0.48	<0.38	<0.98	<0.28	<0.33	<0.31
MW-17A (D)	MW-17A (D)W	12/18/2018	<0.42	<0.29	<0.64	<0.98	<0.33	<0.37	<0.30	<0.98	<0.39	<0.98	<0.48	<0.38	<0.98	<0.28	<0.33	<0.31
MW-9A	MW-9AW	12/18/2018	<0.41	<0.28	<0.62	<0.95	<0.32	<0.36	<0.29	<0.95	<0.38	<0.95	<0.47	<0.37	<0.95	<0.27	<0.32	<0.30

Notes:

1. San Francisco Bay RWQCB, 2019. Summary of Groundwater ESLs, Jan. 2019 (Rev. 1) - Aquatic Habitat Goal Levels (Table GW-2): Saltwater Ecotox.
2. PAHs were analyzed by USEPA Method 8270C.
3. Non-detect results are presented with "<" followed by the MDL.
4. Results in bold font indicate a detection above the MDL.
5. Gray shading indicates a detection above the comparison criteria.

Abbreviations and Symbols:

"<" - Non-detect result
µg/L - microgram per liter
(D) - Duplicate sample
MDL - Method Detection Limit
RWQCB - Regional Water Quality Control Board
USEPA - United States Environmental Protection Agency
PAHs - Polynuclear Aromatic Hydrocarbons

DRAFT

Table 9: Volatile Organic Compounds and Total Petroleum Hydrocarbons
Concentrations in Groundwater, A-Fill Water-Bearing Zone
UPC OU-2
Brisbane, California

Sample Location	Sample Name	Collection Date	1,1,1-Trichloroethane	1,1,2-Trichloro-1,2,2-trifluoroethane	1,1-Dichloroethane	1,1-Dichloroethene	1,2,3-Trichlorobenzene	1,2,4-Trimethylbenzene	1,2-Dichlorobenzene	1,3,5-Trimethylbenzene	4-Isopropyltoluene	Acetone	Benzene	Chloroethane	cis-1,2-Dichloroethene	Ethylbenzene	Isopropylbenzene	Methyl-tert-butyl ether (MTBE)	Naphthalene	n-Butylbenzene	n-Propylbenzene	sec-Butylbenzene	Styrene	Tetrachloroethene (PCE)	Toluene	trans-1,2-Dichloroethene	Trichloroethene (TCE)	Vinyl Chloride	Xylenes, Total	TPH-Diesel (C10-C28)	TPH-Gasoline (C4-C12)	TPH-Motor Oil (C24-C36)
Aquatic Habitat Goal Levels Saltwater Ecotox ESL [1]			3.1E+03	--	-	2.2E+04	--	--	6.5E+01	--	--	--	3.5E+02	-	2.2E+04	4.3E+01	--	8.0E+03	1.5E+01	--	--	--	--	2.3E+02	2.5E+03	2.2E+04	2.0E+02	-	1.0E+02	6.4E+02	3.7E+03	--
Vapor Intrusion Human Health Risk Residential ESL [2]			1.5E+03	--	7.6E+00	6.6E+01	--	--	2.7E+03	--	--	2.3E+07	4.2E-01	2.3E+04	4.9E+01	3.5E+00	--	4.5E+02	4.6E+00	--	--	--	8.5E+03	6.4E-01	1.2E+03	2.2E+02	1.2E+00	8.6E-03	3.9E+02	-	--	--
		Units	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
DG-AA11	DG-AA11W	1/30/2019	<0.25	<0.50	**1.3**	<0.25	<0.40	**0.65**	<0.25	<0.25	<0.25	<10	<0.25	**4.5**	**0.52**	<0.25	**0.25**	<0.25	<0.40	**0.73**	**0.25**	**0.68**	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	**2300**	<0.25	**2300**	**720**
DG-AA15	DG-AA15W	1/25/2019	**1.3**	<0.50	**5.2**	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	**10**	**3.6**	<0.25	<0.25	<0.25	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35	<0.25	<35	**450**
DG-AA19	DG-AA19W	1/25/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	**1600**	<0.25	**1600**	**990**
DG-AA3	DG-AA3W	12/18/2018	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	**1.7**	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35	<0.25	<35	**210**
DG-AA7	DG-AA7W	1/11/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35	<0.25	<35	**130**
DG-AB13	DG-AB13W	1/25/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35	<0.25	<35	<100
DG-AB13 (D)	DG-AB13 (D)W	1/25/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35	<0.25	<35	**100**
DG-AB17	DG-AB17W	1/25/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	**0.43**	<0.40	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	**700**	<0.25	**700**	**630**
DG-AB5	DG-AB5W	1/31/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35	<0.25	<35	**110**
DG-AB5 (D)	DG-AB5 (D)W	1/31/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35	<0.25	<35	**110**
DG-AC15	DG-AC15W	2/1/2019	<0.25	<0.50	<0.25	<0.25	<0.40	**4.0**	<0.25	**1.0**	**0.4**	<10	**3.7**	<0.40	<0.25	**1.1**	**0.55**	<0.25	**11**	<0.40	**0.48**	<0.25	<0.25	<0.25	**1.2**	<0.25	<0.25	**7.7**	**120**	<0.25	**120**	**3700**
DG-AC3	DG-AC3W	12/19/2018	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	**2.6**	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35	<0.25	<35	**240**
DG-AC7	DG-AC7W	1/11/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35	<0.25	<35	**140**
DG-AC7 (D)	DG-AC7 (D)W	1/11/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35	<0.25	<35	<100
DG-AD13	DG-AD13W	2/1/2019	<0.25	<0.50	<0.25	<0.25	<0.40	**4.9**	<0.25	**1.2**	**0.38**	**19**	**5.1**	<0.40	<0.25	**5.3**	**0.63**	<0.25	**18**	<0.40	**0.78**	<0.25	**0.36**	<0.25	**15**	<0.25	<0.25	**14**	**290**	<0.25	**290**	**9900**
DG-AD13 (D)	DG-AD13 (D)W	2/1/2019	<0.25	<0.50	<0.25	<0.25	<0.40	**3.4**	<0.25	**0.86**	<0.25	**18**	**3.7**	<0.40	<0.25	**3.7**	**0.43**	<0.25	**13**	<0.40	**0.47**	<0.25	<0.25	<0.25	**11**	<0.25	<0.25	**11**	**190**	<0.25	**190**	**9400**
DG-AD17	DG-AD17W	1/25/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	**13**	<0.25	<0.40	**0.34**	<0.25	<0.25	<0.25	**0.88**	<0.40	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35	<0.25	<35	**2500**
DG-AD5	DG-AD5W	1/7/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35	<0.25	<35	**120**
DG-AD9	DG-AD9W	1/11/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35	<0.25	<35	**570**
DG-AE11	DG-AE11W	1/22/2019	<0.25	<0.50	<0.25	<0.25	<0.40	**0.25**	<0.25	<0.25	**0.29**	**12**	**0.78**	<0.40	<0.25	**0.27**	**0.98**	<0.25	**2.2**	**0.48**	**1.2**	**0.28**	<0.25	<0.25	**0.35**	<0.25	<0.25	**0.59**	**190**	<0.25	<35	**180**
DG-AE3	DG-AE3W	12/19/2018	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	**3.7**	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35	<0.25	<35	**190**
DG-AE7	DG-AE7W	1/11/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35	<0.25	<35	<110
DG-AF5	DG-AF5W	1/7/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	**0.82**	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35	<0.25	**160**	<200
DG-AG11	DG-AG11W	1/22/2019	<0.25	<0.50	<0.25	<0.25	<0.40	**0.29**	<0.25	<0.25	<0.25	<10	**1.5**	<0.40	<0.25	<0.25	**1.4**	<0.25	<0.40	**0.5**	**1.3**	**0.49**	<0.25	<0.25	**0.39**	<0.25	<0.25	**0.69**	**390**	<0.25	<35	**2900**
DG-AG15	DG-AG15W	1/24/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	**4.6**	<0.40	<0.25	<0.25	**0.87**	<0.25	**0.69**	**1.1**	**1.7**	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	**160**	<0.25	<35	**130**
DG-AG3	DG-AG3W	12/19/2018	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	**15**	<0.25	<0.40	<0.25	<0.25	<0.25	**7.9**	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35	<0.25	**100**	**6300**
DG-AG7	DG-AG7W	1/31/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	**0.54**	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35	<0.25	<35	<100
DG-AH13	DG-AH13W	1/29/2019	<0.25	<0.50	<0.25	<0.25	<0.40	**0.31**	<0.25	<0.25	<0.25	<10	**7.1**	<0.40	<0.25	**0.52**	**1.6**	**0.3**	<0.40	**0.5**	**1.7**	**0.5**	<0.25	<0.25	**0.72**	<0.25	<0.25	**1.1**	**100**	<0.25	**260**	**360**
DG-AH5	DG-AH5W	1/7/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	**12**	<0.25	<0.40	<0.25	<0.25	<0.25	**0.3**	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35	<0.25	<35	**620**
DG-AI15	DG-AI15W	1/25/2019	<0.25	<0.50	<0.25	<0.25	<0.40	**1.7**	<0.25	**0.44**	<0.25	**24**	**14**	<0.40	<0.25	**7.3**	**0.58**	**11**	**8.3**	<0.40	**1.6**	<0.25	<0.25	<0.25	**3.4**	<0.25	<0.25	**16**	**260**	<0.25	<35	**500**
DG-AI3	DG-AI3W	12/19/2018	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	**6.2**	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35	<0.25	<35	**230**
DG-AI3 (D)	DG-AI3 (D)W	12/19/2018	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	**6.0**	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35	<0.25	<35	**2300**
DG-AI7	DG-AI7W	1/11/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35	<0.25	<35	<110
DG-AJ13	DG-AJ13W	1/29/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	**0.77**	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	**0.29**	<0.25	<0.25	<0.50	<35	<0.25	**87**	**2900**
DG-AJ5	DG-AJ5W	1/7/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	**5.4**	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35	<0.25	**170**	**610**
DG-AK11	DG-AK11W	1/29/2019	<0.25	<0.50	<0.25	<0.25	<0.40	**0.83**	<0.25	<0.25	**0.26**	<10	**1.5**	<0.40	<0.25	<0.25	**0.48**	**1.3**	**2.1**	<0.40	**0.35**	<0.25	<0.25	<0.25	**0.53**	<0.25	<0.25	**1.5**	**87**	<0.25	<35	**380**
DG-AK15	DG-AK15W	1/24/2019	<0.25	<0.50	<0.25	<0.25	<0.40	**0.74**	<0.25	<0.25	<0.25	**14**	**4.6**	<0.40	<0.25	**0.74**	<0.25	<0.25	**45**	<0.40	**0.41**	<0.25	<0.25	<0.25	**0.93**	<0.25	<0.25	**2.4**	**170**	<0.25	<35	**120**
DG-AK3	DG-AK3W	12/19/2018	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	**6.7**	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35	<0.25	<35	**100**
DG-AK7	DG-AK7W	1/11/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	**0.77**	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35	<0.25	<35	**1900**
DG-AK7 (D)	DG-AK7 (D)W	1/11/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	**0.76**	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35	<0.25	<35	**350**
DG-AL13	DG-AL13W	1/29/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	**0.35**	<0.40	<0.25	<0.25	<0.25	**4.0**	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	**0.31**	<0.25	<0.25	<0.50	<35	<0.25	**150**	<110
DG-AL5	DG-AL5W	1/31/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	**3.0**	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35	<0.25	<35	**190**
DG-AL9	DG-AL9W	1/22/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	**0.9**	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35	<0.25	<35	**140**
DG-AM15	DG-AM15W	1/24/2019	<0.25	**1.1**	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	**4.5**	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	**150**	<0.25	<35	**460**
DG-AM3	DG-AM3W	12/19/2018	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	**7.2**	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35	<0.25	<35	**120**
DG-AM7	DG-AM7W	1/11/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	**1.6**	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35	<0.25	<35	<110
DG-AN13	DG-AN13W	2/1/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	**0.31**	<0.40	<0.25	<0.25	<0.25	<0.25	**0.82**	<0.40	<0.25	<0.25	<0.25	<0.25	**0.37**	<0.25	<0.25	<0.50	<35	<0.25	<35	**--**
DG-AN5	DG-AN5W	12/20/2018	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	**4.0**	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35	<0.25	<35	**4200**
DG-AN9	DG-AN9W	1/21/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	**17**	<0.25	<0.40	<0.25	<0.25	<0.25	**1.4**	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35	<0.25	<35	**150**
DG-AO11	DG-AO11W	1/31/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	**1.5**	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	**0.88**	<0.25	<0.25	**0.57**	<35	<0.25	<35	**250**
DG-AO3	DG-AO3W	12/19/2018	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	**10**	<0.25	<0.40	<0.25	<0.25	<0.25	**7.3**	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35	<0.25	<35	<110
DG-AO7	DG-AO7W	1/11/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	**2.4**	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35	<0.25	<35	**500**
DG-AP5	DG-AP5W	12/20/2018	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	**5.0**	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35	<0.25	<35	**350**
DG-AP9	DG-AP9W	1/21/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	**17**	<0.25	<0.40	<0.25	<0.25	<0.25	**1.6**	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35	<0.25	<35	**160**
DG-AQ11	DG-AQ11W	1/31/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	**0.36**	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35	<0.25	<35	**220**

Table 9: Volatile Organic Compounds and Total Petroleum Hydrocarbons
Concentrations in Groundwater, A-Fill Water-Bearing Zone
UPC OU-2
Brisbane, California

Sample Location	Sample Name	Collection Date	1,1,1-Trichloroethane	1,1,2-Trichloro-1,2,2-trifluoroethane	1,1-Dichloroethane	1,1-Dichloroethene	1,2,3-Trichlorobenzene	1,2,4-Trimethylbenzene	1,2-Dichlorobenzene	1,3,5-Trimethylbenzene	4-Isopropyltoluene	Acetone	Benzene	Chloroethane	cis-1,2-Dichloroethene	Ethylbenzene	Isopropylbenzene	Methyl-tert-butyl ether (MTBE)	Naphthalene	n-Butylbenzene	n-Propylbenzene	sec-Butylbenzene	Styrene	Tetrachloroethene (PCE)	Toluene	trans-1,2-Dichloroethene	Trichloroethene (TCE)	Vinyl Chloride	Xylenes, Total	TPH-Diesel (C10-C28)	TPH-Gasoline (C4-C12)	TPH-Motor Oil (C24-C36)
Aquatic Habitat Goal Levels Saltwater Ecotox ESL [1]			3.1E+03	--	-	2.2E+04	--	--	6.5E+01	--	--	--	3.5E+02	-	2.2E+04	4.3E+01	--	8.0E+03	1.5E+01	--	--	--	--	2.3E+02	2.5E+03	2.2E+04	2.0E+02	-	1.0E+02	6.4E+02	3.7E+03	--
Vapor Intrusion Human Health Risk Residential ESL [2]			1.5E+03	--	7.6E+00	6.6E+01	--	--	2.7E+03	--	--	2.3E+07	4.2E-01	2.3E+04	4.9E+01	3.5E+00	--	4.5E+02	4.6E+00	--	--	--	8.5E+03	6.4E-01	1.2E+03	2.2E+02	1.2E+00	8.6E-03	3.9E+02	-	--	--
		Units	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
DG-AQ3	DG-AQ3W	12/19/2018	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	**6.1**	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35	<0.25	<35	**160**
DG-AQ7	DG-AQ7W	1/31/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	**4.5**	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35	<0.25	<35	**120**
DG-AR5	DG-AR5W	12/20/2018	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	**4.8**	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35	<0.25	<35	**300**
DG-AR9	DG-AR9W	1/11/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	**1.2**	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35	<0.25	<35	**2500**
DG-AR9 (D)	DG-AR9 (D)W	1/11/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	**1.3**	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35	<0.25	<35	**1900**
DG-AS11	DG-AS11W	1/31/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	<0.25	**0.26**	<0.25	<0.50	<35	<0.25	<35	<110
DG-AS3	DG-AS3W	12/20/2018	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	**1.5**	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35	<0.25	<35	**220**
DG-AS3 (D)	DG-AS3 (D)W	12/20/2018	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	**1.5**	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35	<0.25	<35	**130**
DG-AS7	DG-AS7W	1/11/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	**2.2**	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35	<0.25	<35	**250**
DG-AT5	DG-AT5W	12/20/2018	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	**10**	<0.25	<0.40	<0.25	<0.25	<0.25	**1.9**	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35	<0.25	<35	<110
DG-AT9	DG-AT9W	1/31/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	**2.0**	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35	<0.25	<35	**110**
DG-AU3	DG-AU3W	12/20/2018	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	**0.48**	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35	<0.25	<35	**160**
DG-AU7	DG-AU7W	1/11/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	**2.5**	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35	<0.25	<35	**220**
DG-AU7 (D)	DG-AU7 (D)W	1/11/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	**2.4**	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35	<0.25	**79**	**500**
DG-AV5	DG-AV5W	12/20/2018	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	**2.7**	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35	<0.25	<35	**500**
DG-AV9	DG-AV9W	2/1/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35	<0.25	<35	**210**
DG-AW11	DG-AW11W	1/24/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	**79**	<0.25	<35	**920**
DG-AW11 (D)	DG-AW11 (D)W	1/24/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35	<0.25	<35	**530**
DG-AW3	DG-AW3W	1/31/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	**4.1**	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35	<0.25	<35	<110
DG-AX5	DG-AX5W	12/20/2018	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35	<0.25	<35	<100
DG-AY3	DG-AY3W	2/1/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	**4.1**	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35	<0.25	<35	<96
DG-N1	DG-N1W	12/18/2018	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35	<0.25	<35	**140**
DG-N13	DG-N13W	1/11/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	**10**	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35	<0.25	<35	**130**
DG-N13 (D)	DG-N13 (D)W	1/11/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35	<0.25	<35	<110
DG-N5	DG-N5W	1/10/2019	<0.25	<0.50	<0.25	<0.25	**0.41**	<0.25	<0.25	<0.25	<0.25	**16**	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	**0.45**	<0.40	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35	<0.25	<35	**97**
DG-N9	DG-N9W	1/14/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	**2.0**	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35	<0.25	<35	<110
DG-O11	DG-O11W	1/14/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35	<0.25	**40**	**1100**
DG-O15	DG-O15W	1/11/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35	<0.25	<35	<110
DG-O3	DG-O3W	12/18/2018	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35	<0.25	**37**	<99
DG-O7	DG-O7W	1/10/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	**15**	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	**40**	<0.25	<35	**410**
DG-P13	DG-P13W	1/11/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35	<0.25	<35	**1400**
DG-P5	DG-P5W	1/10/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	**37**	<0.25	**35**	**120**
DG-Q11	DG-Q11W	1/15/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	**0.56**	<0.25	<0.25	<0.25	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35	<0.25	<35	**160**
DG-Q11 (D)	DG-Q11 (D)W	1/15/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	**0.7**	<0.25	<0.25	<0.25	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35	<0.25	**39**	**110**
DG-Q15	DG-Q15W	1/11/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	**35**	<0.25	<35	**130**
DG-Q7	DG-Q7W	1/10/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	**0.29**	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35	<0.25	<35	**160**
DG-Q7 (D)	DG-Q7 (D)W	1/10/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	**0.29**	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	**39**	<0.25	<35	**120**
DG-R1	DG-R1W	12/17/2018	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35	<0.25	<35	<100
DG-R13	DG-R13W	1/29/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	**0.34**	<0.25	<0.25	<0.50	<35	<0.25	<35	**680**
DG-R5	DG-R5W	1/30/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	**0.35**	<0.25	<0.25	<0.50	<35	<0.25	<35	**210**
DG-R9	DG-R9W	1/25/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	**24**	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35	<0.25	**37**	**120**
DG-S11	DG-S11W	1/15/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35	<0.25	<35	**1700**
DG-S15	DG-S15W	1/11/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40	<0.25	<0.25	<0.25	**0.72**	<0.25	<0.25	<0.25	<0.50	<35	<0.25	<35	<98
DG-S15 (D)	DG-S15 (D)W	1/11/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40	<0.25	<0.25	<0.25	**0.66**	<0.25	<0.25	<0.25	<0.50	**37**	<0.25	<35	**160**
DG-S3	DG-S3W	12/18/2018	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35	<0.25	<35	**150**
DG-S7	DG-S7W	1/10/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	**11**	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35	<0.25	<35	**--**
DG-T1	DG-T1W	12/17/2018	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35	<0.25	**790**	<100
DG-T13	DG-T13W	1/15/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35	<0.25	<35	<110
DG-T17	DG-T17W	1/31/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	**21**	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	**0.62**	<0.25	<0.25	<0.50	<35	<0.25	<35	<120
DG-T5	DG-T5W	1/7/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	**790**	<0.25	**36**	**2700**
DG-T9	DG-T9W	1/14/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	**18**	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35	<0.25	<35	**2600**
DG-U11	DG-U11W	1/15/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35	<0.25	<35	**750**
DG-U15	DG-U15W	1/28/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	**0.78**	<0.25	<0.25	<0.50	**36**	<0.25	**38**	<100
DG-U3	DG-U3W	12/18/2018	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	**0.33**	<0.25	<0.25	<0.25	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35	<0.25	<35	**3300**
DG-U3 (D)	DG-U3 (D)W	12/18/2018	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35	<0.25	<35	**2000**

Table 9: Volatile Organic Compounds and Total Petroleum Hydrocarbons
Concentrations in Groundwater, A-Fill Water-Bearing Zone
UPC OU-2
Brisbane, California

Sample Location	Sample Name	Collection Date	1,1,1-Trichloroethane	1,1,2-Trichloro-1,2,2-trifluoroethane	1,1-Dichloroethane	1,1-Dichloroethene	1,2,3-Trichlorobenzene	1,2,4-Trimethylbenzene	1,2-Dichlorobenzene	1,3,5-Trimethylbenzene	4-Isopropyltoluene	Acetone	Benzene	Chloroethane	cis-1,2-Dichloroethene	Ethylbenzene	Isopropylbenzene	Methyl-tert-butyl ether (MTBE)	Naphthalene	n-Butylbenzene	n-Propylbenzene	sec-Butylbenzene	Styrene	Tetrachloroethene (PCE)	Toluene	trans-1,2-Dichloroethene	Trichloroethene (TCE)	Vinyl Chloride	Xylenes, Total	TPH-Diesel (C10-C28)	TPH-Gasoline (C4-C12)	TPH-Motor Oil (C24-C36)
Aquatic Habitat Goal Levels Saltwater Ecotox ESL [1]			3.1E+03	--	-	2.2E+04	--	--	6.5E+01	--	--	--	3.5E+02	-	2.2E+04	4.3E+01	--	8.0E+03	1.5E+01	--	--	--	--	2.3E+02	2.5E+03	2.2E+04	2.0E+02	-	1.0E+02	6.4E+02	3.7E+03	--
Vapor Intrusion Human Health Risk Residential ESL [2]			1.5E+03	--	7.6E+00	6.6E+01	--	--	2.7E+03	--	--	2.3E+07	4.2E-01	2.3E+04	4.9E+01	3.5E+00	--	4.5E+02	4.6E+00	--	--	--	8.5E+03	6.4E-01	1.2E+03	2.2E+02	1.2E+00	8.6E-03	3.9E+02	-	--	--
		Units	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
DG-U7	DG-U7W	1/10/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	**38**	<0.25	<35	**290**
DG-V1	DG-V1W	12/17/2018	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35	<0.25	<35	<100
DG-V13	DG-V13W	1/15/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35	<0.25	<35	<110
DG-V17	DG-V17W	1/28/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	**0.46**	<0.25	<0.25	<0.50	<35	<0.25	<35	**--**
DG-V5	DG-V5W	1/7/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35	<0.25	<35	**1100**
DG-V9	DG-V9W	1/14/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35	<0.25	<35	**130**
DG-W11	DG-W11W	1/30/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35	<0.25	<35	<100
DG-W15	DG-W15W	1/29/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35	<0.25	<35	**160**
DG-W3	DG-W3W	12/18/2018	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35	<0.25	<35	**190**
DG-W7	DG-W7W	1/30/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35	<0.25	**67**	**490**
DG-X1	DG-X1W	12/17/2018	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	**1.3**	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35	<0.25	<35	<100
DG-X13	DG-X13W	1/25/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35	<0.25	<35	<100
DG-X17	DG-X17W	1/28/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	**67**	<0.25	**290**	**2900**
DG-X5	DG-X5W	1/7/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	**11**	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35	<0.25	<35	**300**
DG-X9	DG-X9W	1/14/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35	<0.25	<35	**180**
DG-Y11	DG-Y11W	1/22/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40	<0.25	**0.49**	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	**1200**	<0.25	<35	<100
DG-Y15	DG-Y15W	2/1/2019	**18**	<0.50	**52**	**0.44**	<0.40	<0.25	**0.25**	<0.25	<0.25	<10	<0.25	**77**	**45**	<0.25	<0.25	<0.25	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	**0.97**	<0.25	<0.25	<0.25	<0.50	**290**	**0.60**	**95**	**1400**
DG-Y19	DG-Y19W	1/28/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	**0.26**	<0.25	<0.25	<0.50	<35	<0.25	<35	<110
DG-Y3	DG-Y3W	12/18/2018	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	**0.39**	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35	<0.25	<35	**240**
DG-Y7	DG-Y7W	1/11/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35	<0.25	<21	**--**
DG-Z17	DG-Z17W	1/28/2019	<0.25	<0.50	**0.26**	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	**0.43**	<0.40	<0.25	<0.25	<0.25	<0.25	<0.25	**0.32**	<0.25	<0.25	<0.50	**95**	<0.25	<21	**240**
DG-Z5	DG-Z5W	1/7/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35	<0.25	<21	**230**
DG-Z9	DG-Z9W	1/15/2019	<0.25	<0.50	<0.25	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<10	<0.25	<0.40	<0.25	<0.25	<0.25	<0.25	<0.40	<0.40	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.50	<35	<0.25	<21	<68
KMW-4A	KMW-4AW	12/18/2018	<0.20	<0.091	<0.11	<0.20	<0.21	<0.20	<0.21	<0.17	<0.20	<20	<0.25	<0.17	<0.076	<0.13	<0.20	**6.5**	<0.22	<0.30	<0.20	<0.17	<0.22	<0.20	<0.17	<0.17	<0.30	<0.40	<21	<0.13	<21	**1800**
KMW-7A	KMW-7AW	12/19/2018	<0.20	<0.091	<0.11	<0.20	<0.21	<0.20	<0.21	<0.17	<0.20	<20	<0.25	<0.17	<0.076	<0.13	<0.20	**6.1**	<0.22	<0.30	<0.20	<0.17	<0.22	<0.20	<0.17	<0.17	<0.30	<0.40	<21	<0.13	<21	**400**
LF-3A	LF-3AW	12/18/2018	<0.20	<0.091	<0.11	<0.20	<0.21	<0.20	<0.21	<0.17	<0.20	<20	<0.25	<0.17	<0.076	<0.13	<0.20	<0.11	<0.22	<0.30	<0.20	<0.17	<0.22	<0.20	<0.17	<0.17	<0.30	<0.40	<21	<0.13	<21	<68
LF-3A (D)	LF-3A (D)W	12/18/2018	<0.20	<0.091	<0.11	<0.20	<0.21	<0.20	<0.21	<0.17	<0.20	<20	<0.25	<0.17	<0.076	<0.13	<0.20	<0.11	<0.22	<0.30	<0.20	<0.17	<0.22	<0.20	<0.17	<0.17	<0.30	<0.40	<21	<0.13	<21	**1400**
LF-4A	LF-4AW	12/18/2018	<0.20	<0.091	<0.11	<0.20	<0.21	<0.20	<0.21	<0.17	<0.20	<20	<0.25	<0.17	<0.076	<0.13	<0.20	<0.11	<0.22	<0.30	<0.20	<0.17	<0.22	<0.20	<0.17	<0.17	<0.30	<0.40	<21	<0.13	<21	<68
LF-5A	LF-5AW	12/19/2018	<0.20	<0.091	<0.11	<0.20	<0.21	<0.20	<0.21	<0.17	<0.20	<20	<0.25	<0.17	<0.076	<0.13	<0.20	<0.11	<0.22	<0.30	<0.20	<0.17	<0.22	<0.20	<0.17	<0.17	<0.30	<0.40	<21	<0.13	<21	**140**
LF-7A	LF-7AW	12/19/2018	<0.20	<0.091	<0.11	<0.20	<0.21	<0.20	<0.21	<0.17	<0.20	<20	<0.25	<0.17	<0.076	<0.13	<0.20	**2.0**	<0.22	<0.30	<0.20	<0.17	<0.22	<0.20	<0.17	<0.17	<0.30	<0.40	<21	<0.13	<21	<70
LF-8A	LF-8AW	12/19/2018	<0.20	<0.091	<0.11	<0.20	<0.21	<0.20	<0.21	<0.17	<0.20	<20	<0.25	<0.17	<0.076	<0.13	<0.20	**5.3**	<0.22	<0.30	<0.20	<0.17	<0.22	<0.20	<0.17	<0.17	<0.30	<0.40	<21	<0.13	<21	**150**
MK-2A	MK-2AW	12/18/2018	<0.20	<0.091	<0.11	<0.20	<0.21	<0.20	<0.21	<0.17	<0.20	<20	<0.25	<0.17	<0.076	<0.13	<0.20	<0.11	<0.22	<0.30	<0.20	<0.17	<0.22	<0.20	<0.17	<0.17	<0.30	<0.40	<21	<0.13	<21	**210**
MK-7A	MK-7AW	12/19/2018	<0.20	<0.091	<0.11	<0.20	<0.21	<0.20	<0.21	<0.17	<0.20	<20	<0.25	<0.17	<0.076	<0.13	<0.20	**1.0**	<0.22	<0.30	<0.20	<0.17	<0.22	<0.20	<0.17	<0.17	<0.30	<0.40	<21	<0.13	<21	**700**
MK-8A	MK-8AW	12/19/2018	<0.20	<0.091	<0.11	<0.20	<0.21	<0.20	<0.21	<0.17	<0.20	<20	<0.25	<0.17	<0.076	<0.13	<0.20	<0.11	<0.22	<0.30	<0.20	<0.17	<0.22	**0.98**	<0.17	<0.17	<0.30	<0.40	<21	<0.13	<21	**2400**
MW-10A	MW-10AW	12/19/2018	<0.20	<0.091	<0.11	<0.20	<0.21	<0.20	<0.21	<0.17	<0.20	<20	<0.25	<0.17	<0.076	<0.13	<0.20	**3.3**	<0.22	<0.30	<0.20	<0.17	<0.22	<0.20	<0.17	<0.17	<0.30	<0.40	<21	<0.13	<21	**250**
MW-11AR	MW-11ARW	12/18/2018	<0.20	<0.091	<0.11	<0.20	<0.21	<0.20	<0.21	<0.17	<0.20	<20	<0.25	<0.17	<0.076	<0.13	<0.20	<0.11	<0.22	<0.30	<0.20	<0.17	<0.22	<0.20	<0.17	<0.17	<0.30	<0.40	<21	<0.13	<21	**200**
MW-13A	MW-13AW	12/18/2018	<0.20	<0.091	<0.11	<0.20	<0.21	<0.20	<0.21	<0.17	<0.20	<20	<0.25	<0.17	<0.076	<0.13	**1.0**	<0.11	<0.22	<0.30	<0.20	<0.17	<0.22	<0.20	<0.17	<0.17	<0.30	<0.40	<21	<0.13	<21	<68
MW-15A	MW-15AW	12/18/2018	<0.20	<0.091	<0.11	<0.20	<0.21	<0.20	<0.21	<0.17	<0.20	<20	<0.25	<0.17	<0.076	<0.13	<0.20	<0.11	<0.22	<0.30	<0.20	<0.17	<0.22	<0.20	<0.17	<0.17	<0.30	<0.40	<21	<0.13	<21	**--**
MW-17A	MW-17AW	12/18/2018	<0.20	<0.091	<0.11	<0.20	<0.21	<0.20	<0.21	<0.17	<0.20	<20	<0.25	<0.17	<0.076	<0.13	<0.20	<0.11	<0.22	<0.30	<0.20	<0.17	<0.22	<0.20	<0.17	<0.17	<0.30	<0.40	<21	<0.13	**--**	**--**
MW-17A (D)	MW-17A (D)W	12/18/2018	<0.20	<0.091	<0.11	<0.20	<0.21	<0.20	<0.21	<0.17	<0.20	<20	<0.25	<0.17	<0.076	<0.13	<0.20	<0.11	<0.22	<0.30	<0.20	<0.17	<0.22	<0.20	<0.17	<0.17	<0.30	<0.40	<21	<0.13	**--**	**--**
MW-9A	MW-9AW	12/18/2018	<0.20	<0.091	<0.11	<0.20	<0.21	<0.20	<0.21	<0.17	<0.20	<20	<0.25	<0.17	<0.076	<0.13	<0.20	<0.11	<0.22	<0.30	<0.20	<0.17	<0.22	<0.20	<0.17	<0.17	<0.30	<0.40	<21	<0.13	**--**	**--**

Table 9: Volatile Organic Compounds and Total Petroleum Hydrocarbons Concentrations in Groundwater, A-Fill Water-Bearing Zone
UPC OU-2
Brisbane, California

Notes:

1. San Francisco Bay RWQCB, 2019. Summary of Groundwater ESLs, Jan. 2019 (Rev. 1) - Aquatic Habitat Goal Levels (Table GW-2): Saltwater Ecotox.
2. San Francisco Bay RWQCB, 2019. Summary of Groundwater ESLs, Jan. 2019 (Rev. 1) - Groundwater Vapor Intrusion Human Health Risk Levels (Table GW-3): Residential.
3. The lower RWQCB ESL is used as comparison criteria when available.
4. VOCs and TPH-gasoline were analyzed by USEPA
5. TPH-diesel and motor oil were analyzed by USEPA Method 8015B.
6. Only analytes with detections are included in this table.
7. Non-detect results are presented with "<" followed by the MDL.
8. Results in bold font indicate a detection above the MDL.
9. Gray shading indicates a detection above the comparison criteria.

Abbreviations and Symbols:

"<" - Non-detect result
µg/L - microgram per liter
(D) - Duplicate sample
MDL - Method Detection Limit
USEPA - United States Environmental Protection Agency
TPH - total petroleum hydrocarbons
VOC - Volatile Organic Compound
ESL - Environmental Screening Level
RWQCB - Regional Water Quality Control Board

APPENDIX B
ProUCL Output Files

APPENDIX B-1A1
Metals in Soil - All Areas Except for Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - milligrams per kilogram (mg/kg)

Antimony

General Statistics			
Total Number of Observations	471	Number of Distinct Observations	160
Number of Detects	408	Number of Non-Detects	63
Number of Distinct Detects	146	Number of Distinct Non-Detects	23
Minimum Detect	0.27	Minimum Non-Detect	0.17
Maximum Detect	4300	Maximum Non-Detect	120
Variance Detects	47245	Percent Non-Detects	13.38%
Mean Detects	20.36	SD Detects	217.4
Median Detects	2.55	CV Detects	10.68
Skewness Detects	19	Kurtosis Detects	372.3
Mean of Logged Detects	1.153	SD of Logged Detects	1.326

Normal GOF Test on Detects Only			
Shapiro Wilk Test Statistic	0.083	Normal GOF Test on Detected Observations Only	
5% Shapiro Wilk P Value	0	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.463	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.0442	Detected Data Not Normal at 5% Significance Level	
Detected Data Not Normal at 5% Significance Level			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
KM Mean	17.75	KM Standard Error of Mean	9.327
KM SD	202.2	95% KM (BCA) UCL	36.33
95% KM (t) UCL	33.12	95% KM (Percentile Bootstrap) UCL	36.43
95% KM (z) UCL	33.09	95% KM Bootstrap t UCL	180.5
90% KM Chebyshev UCL	45.73	95% KM Chebyshev UCL	58.4
97.5% KM Chebyshev UCL	75.99	99% KM Chebyshev UCL	110.5

Gamma GOF Tests on Detected Observations Only			
A-D Test Statistic	2.45E+28	Anderson-Darling GOF Test	
5% A-D Critical Value	0.857	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.268	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.0483	Detected Data Not Gamma Distributed at 5% Significance Level	
Detected Data Not Gamma Distributed at 5% Significance Level			

Gamma Statistics on Detected Data Only			
k hat (MLE)	0.36	k star (bias corrected MLE)	0.359
Theta hat (MLE)	56.59	Theta star (bias corrected MLE)	56.75
nu hat (MLE)	293.6	nu star (bias corrected)	292.7
Mean (detects)	20.36		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	17.65
Maximum	4300	Median	2.1
SD	202.4	CV	11.47
k hat (MLE)	0.282	k star (bias corrected MLE)	0.281
Theta hat (MLE)	62.69	Theta star (bias corrected MLE)	62.77
nu hat (MLE)	265.2	nu star (bias corrected)	264.9
Adjusted Level of Significance (β)	0.0495		
Approximate Chi Square Value (264.87, α)	228.2	Adjusted Chi Square Value (264.87, β)	228.1
95% Gamma Approximate UCL (use when n>=50)	20.49	95% Gamma Adjusted UCL (use when n<50)	20.5

Estimates of Gamma Parameters using KM Estimates			
Mean (KM)	17.75	SD (KM)	202.2
Variance (KM)	40870	SE of Mean (KM)	9.327
k hat (KM)	0.00771	k star (KM)	0.00907
nu hat (KM)	7.261	nu star (KM)	8.548
theta hat (KM)	2303	theta star (KM)	1956
80% gamma percentile (KM)	2.32E-08	90% gamma percentile (KM)	0.01
95% gamma percentile (KM)	3.89	99% gamma percentile (KM)	454.4

APPENDIX B-1A1
Metals in Soil - All Areas Except for Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - milligrams per kilogram (mg/kg)

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (8.55, α)	3.056	Adjusted Chi Square Value (8.55, β)	3.046
95% Gamma Approximate KM-UCL (use when n>=50)	49.64	95% Gamma Adjusted KM-UCL (use when n<50)	49.8

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Approximate Test Statistic	0.949	Shapiro Wilk GOF Test	
5% Shapiro Wilk P Value	0	Detected Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.0779	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.0442	Detected Data Not Lognormal at 5% Significance Level	
Detected Data Not Lognormal at 5% Significance Level			

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	17.74	Mean in Log Scale	0.872
SD in Original Scale	202.4	SD in Log Scale	1.486
95% t UCL (assumes normality of ROS data)	33.11	95% Percentile Bootstrap UCL	36.27
95% BCA Bootstrap UCL	53.25	95% Bootstrap t UCL	175.2
95% H-UCL (Log ROS)	8.581		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	0.874	KM Geo Mean	2.397
KM SD (logged)	1.48	95% Critical H Value (KM-Log)	2.532
KM Standard Error of Mean (logged)	0.0692	95% H-UCL (KM -Log)	8.515
KM SD (logged)	1.48	95% Critical H Value (KM-Log)	2.532
KM Standard Error of Mean (logged)	0.0692		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	17.89	Mean in Log Scale	0.894
SD in Original Scale	202.4	SD in Log Scale	1.505
95% t UCL (Assumes normality)	33.26	95% H-Stat UCL	9.065

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Data do not follow a Discernible Distribution at 5% Significance Level

Suggested UCL to Use

95% KM (Chebyshev) UCL	58.4

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

APPENDIX B-1A1
Metals in Soil - All Areas Except for Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - milligrams per kilogram (mg/kg)

Arsenic

General Statistics

Total Number of Observations	474	Number of Distinct Observations	194
Number of Detects	461	Number of Non-Detects	13
Number of Distinct Detects	187	Number of Distinct Non-Detects	10
Minimum Detect	0.21	Minimum Non-Detect	0.21
Maximum Detect	840	Maximum Non-Detect	5
Variance Detects	8222	Percent Non-Detects	2.74%
Mean Detects	40.75	SD Detects	90.67
Median Detects	9.7	CV Detects	2.225
Skewness Detects	4.72	Kurtosis Detects	28.12
Mean of Logged Detects	2.485	SD of Logged Detects	1.519

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.465	Normal GOF Test on Detected Observations Only	
5% Shapiro Wilk P Value	0	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.327	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.0416	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	39.66	KM Standard Error of Mean	4.118
KM SD	89.56	95% KM (BCA) UCL	47.24
95% KM (t) UCL	46.44	95% KM (Percentile Bootstrap) UCL	46.5
95% KM (z) UCL	46.43	95% KM Bootstrap t UCL	47.63
90% KM Chebyshev UCL	52.01	95% KM Chebyshev UCL	57.61
97.5% KM Chebyshev UCL	65.38	99% KM Chebyshev UCL	80.63

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	22.44	Anderson-Darling GOF Test	
5% A-D Critical Value	0.821	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.184	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.0447	Detected Data Not Gamma Distributed at 5% Significance Level	

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.517	k star (bias corrected MLE)	0.515
Theta hat (MLE)	78.85	Theta star (bias corrected MLE)	79.15
nu hat (MLE)	476.5	nu star (bias corrected)	474.8
Mean (detects)	40.75		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	39.64
Maximum	840	Median	9.35
SD	89.67	CV	2.262
k hat (MLE)	0.463	k star (bias corrected MLE)	0.461
Theta hat (MLE)	85.66	Theta star (bias corrected MLE)	85.94
nu hat (MLE)	438.7	nu star (bias corrected)	437.2
Adjusted Level of Significance (β)	0.0495		
Approximate Chi Square Value (437.24, α)	389.8	Adjusted Chi Square Value (437.24, β)	389.6
95% Gamma Approximate UCL (use when n>=50)	44.47	95% Gamma Adjusted UCL (use when n<50)	44.48

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	39.66	SD (KM)	89.56
Variance (KM)	8022	SE of Mean (KM)	4.118
k hat (KM)	0.196	k star (KM)	0.196
nu hat (KM)	185.9	nu star (KM)	186
theta hat (KM)	202.3	theta star (KM)	202.1
80% gamma percentile (KM)	51.73	90% gamma percentile (KM)	119.9
95% gamma percentile (KM)	205.3	99% gamma percentile (KM)	441.3

APPENDIX B-1A1
Metals in Soil - All Areas Except for Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - milligrams per kilogram (mg/kg)

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (186.01, α)	155.5	Adjusted Chi Square Value (186.01, β)	155.4
95% Gamma Approximate KM-UCL (use when n>=50)	47.45	95% Gamma Adjusted KM-UCL (use when n<50)	47.47

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Approximate Test Statistic	0.972	Shapiro Wilk GOF Test	
5% Shapiro Wilk P Value	1.75E-04	Detected Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.0624	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.0416	Detected Data Not Lognormal at 5% Significance Level	

Detected Data Not Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	39.66	Mean in Log Scale	2.393
SD in Original Scale	89.66	SD in Log Scale	1.6
95% t UCL (assumes normality of ROS data)	46.44	95% Percentile Bootstrap UCL	46.95
95% BCA Bootstrap UCL	48.48	95% Bootstrap t UCL	47.29
95% H-UCL (Log ROS)	47.86		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	2.388	KM Geo Mean	10.89
KM SD (logged)	1.611	95% Critical H Value (KM-Log)	2.662
KM Standard Error of Mean (logged)	0.0742	95% H-UCL (KM -Log)	48.61
KM SD (logged)	1.611	95% Critical H Value (KM-Log)	2.662
KM Standard Error of Mean (logged)	0.0742		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	39.66	Mean in Log Scale	2.382
SD in Original Scale	89.66	SD in Log Scale	1.631
95% t UCL (Assumes normality)	46.44	95% H-Stat UCL	50.04

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Data do not follow a Discernible Distribution at 5% Significance Level

Suggested UCL to Use

95% KM (Chebyshev) UCL	57.61

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

APPENDIX B-1A1
Metals in Soil - All Areas Except for Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - milligrams per kilogram (mg/kg)

Barium

General Statistics			
Total Number of Observations	474	Number of Distinct Observations	133
		Number of Missing Observations	0
Minimum	5.7	Mean	214
Maximum	23000	Median	83
SD	1087	Std. Error of Mean	49.95
Coefficient of Variation	5.081	Skewness	19.6
Normal GOF Test			
Shapiro Wilk Test Statistic	0.141	Shapiro Wilk GOF Test	
5% Shapiro Wilk P Value	0	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.424	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.0411	Data Not Normal at 5% Significance Level	
Data Not Normal at 5% Significance Level			
Assuming Normal Distribution			
95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	296.3	95% Adjusted-CLT UCL (Chen-1995)	344.2
		95% Modified-t UCL (Johnson-1978)	303.8
Gamma GOF Test			
A-D Test Statistic	2.11E+28	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.8	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.236	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.0434	Data Not Gamma Distributed at 5% Significance Level	
Data Not Gamma Distributed at 5% Significance Level			
Gamma Statistics			
k hat (MLE)	0.726	k star (bias corrected MLE)	0.723
Theta hat (MLE)	294.7	Theta star (bias corrected MLE)	296
nu hat (MLE)	688.4	nu star (bias corrected)	685.4
MLE Mean (bias corrected)	214	MLE Sd (bias corrected)	251.7
		Approximate Chi Square Value (0.05)	625.6
Adjusted Level of Significance	0.0495	Adjusted Chi Square Value	625.5
Assuming Gamma Distribution			
95% Approximate Gamma UCL (use when n>=50))	234.5	95% Adjusted Gamma UCL (use when n<50)	234.5
Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.939	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk P Value	0	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.105	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.0411	Data Not Lognormal at 5% Significance Level	
Data Not Lognormal at 5% Significance Level			
Lognormal Statistics			
Minimum of Logged Data	1.74	Mean of logged Data	4.538
Maximum of Logged Data	10.04	SD of logged Data	0.971
Assuming Lognormal Distribution			
95% H-UCL	164.5	90% Chebyshev (MVUE) UCL	173.8
95% Chebyshev (MVUE) UCL	184.8	97.5% Chebyshev (MVUE) UCL	200
99% Chebyshev (MVUE) UCL	229.9		
Nonparametric Distribution Free UCL Statistics			
Data do not follow a Discernible Distribution (0.05)			
Nonparametric Distribution Free UCLs			
95% CLT UCL	296.2	95% Jackknife UCL	296.3
95% Standard Bootstrap UCL	294.3	95% Bootstrap-t UCL	472.7
95% Hall's Bootstrap UCL	601.8	95% Percentile Bootstrap UCL	309.1
95% BCA Bootstrap UCL	401.6		
90% Chebyshev(Mean, Sd) UCL	363.9	95% Chebyshev(Mean, Sd) UCL	431.7
97.5% Chebyshev(Mean, Sd) UCL	525.9	99% Chebyshev(Mean, Sd) UCL	711

APPENDIX B-1A1
Metals in Soil - All Areas Except for Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - milligrams per kilogram (mg/kg)

Suggested UCL to Use	
95% Chebyshev (Mean, Sd) UCL	431.7

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

APPENDIX B-1A1
Metals in Soil - All Areas Except for Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - milligrams per kilogram (mg/kg)

Beryllium

General Statistics			
Total Number of Observations	473	Number of Distinct Observations	116
Number of Detects	258	Number of Non-Detects	215
Number of Distinct Detects	89	Number of Distinct Non-Detects	46
Minimum Detect	0.079	Minimum Non-Detect	0.066
Maximum Detect	120	Maximum Non-Detect	0.63
Variance Detects	55.54	Percent Non-Detects	45.45%
Mean Detects	0.877	SD Detects	7.453
Median Detects	0.32	CV Detects	8.499
Skewness Detects	16.01	Kurtosis Detects	257
Mean of Logged Detects	-1.12	SD of Logged Detects	0.799

Normal GOF Test on Detects Only			
Shapiro Wilk Test Statistic	0.0826	Normal GOF Test on Detected Observations Only	
5% Shapiro Wilk P Value	0	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.457	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.0556	Detected Data Not Normal at 5% Significance Level	
Detected Data Not Normal at 5% Significance Level			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
KM Mean	0.511	KM Standard Error of Mean	0.254
KM SD	5.508	95% KM (BCA) UCL	1.024
95% KM (t) UCL	0.929	95% KM (Percentile Bootstrap) UCL	1.019
95% KM (z) UCL	0.928	95% KM Bootstrap t UCL	5.85
90% KM Chebyshev UCL	1.272	95% KM Chebyshev UCL	1.617
97.5% KM Chebyshev UCL	2.095	99% KM Chebyshev UCL	3.035

Gamma GOF Tests on Detected Observations Only			
A-D Test Statistic	3.88E+28	Anderson-Darling GOF Test	
5% A-D Critical Value	0.809	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.263	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.0597	Detected Data Not Gamma Distributed at 5% Significance Level	
Detected Data Not Gamma Distributed at 5% Significance Level			

Gamma Statistics on Detected Data Only			
k hat (MLE)	0.622	k star (bias corrected MLE)	0.617
Theta hat (MLE)	1.411	Theta star (bias corrected MLE)	1.421
nu hat (MLE)	320.8	nu star (bias corrected)	318.4
Mean (detects)	0.877		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.483
Maximum	120	Median	0.12
SD	5.516	CV	11.42
k hat (MLE)	0.342	k star (bias corrected MLE)	0.341
Theta hat (MLE)	1.413	Theta star (bias corrected MLE)	1.416
nu hat (MLE)	323.2	nu star (bias corrected)	322.5
Adjusted Level of Significance (β)	0.0495		
Approximate Chi Square Value (322.45, α)	281.8	Adjusted Chi Square Value (322.45, β)	281.7
95% Gamma Approximate UCL (use when n>=50)	0.552	95% Gamma Adjusted UCL (use when n<50)	0.553

Estimates of Gamma Parameters using KM Estimates			
Mean (KM)	0.511	SD (KM)	5.508
Variance (KM)	30.34	SE of Mean (KM)	0.254
k hat (KM)	0.00859	k star (KM)	0.00995
nu hat (KM)	8.129	nu star (KM)	9.411
theta hat (KM)	59.42	theta star (KM)	51.33
80% gamma percentile (KM)	5.27E-09	90% gamma percentile (KM)	7.30E-04
95% gamma percentile (KM)	0.168	99% gamma percentile (KM)	13.51

APPENDIX B-1A1
Metals in Soil - All Areas Except for Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - milligrams per kilogram (mg/kg)

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (9.41, α)	3.577	Adjusted Chi Square Value (9.41, β)	3.566
95% Gamma Approximate KM-UCL (use when n>=50)	1.343	95% Gamma Adjusted KM-UCL (use when n<50)	1.347

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Approximate Test Statistic	0.924	Shapiro Wilk GOF Test	
5% Shapiro Wilk P Value	0	Detected Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.0495	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.0556	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Approximate Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.505	Mean in Log Scale	-1.967
SD in Original Scale	5.514	SD in Log Scale	1.161
95% t UCL (assumes normality of ROS data)	0.922	95% Percentile Bootstrap UCL	1.006
95% BCA Bootstrap UCL	1.282	95% Bootstrap t UCL	5.722
95% H-UCL (Log ROS)	0.309		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-1.824	KM Geo Mean	0.161
KM SD (logged)	0.977	95% Critical H Value (KM-Log)	2.09
KM Standard Error of Mean (logged)	0.0454	95% H-UCL (KM -Log)	0.286
KM SD (logged)	0.977	95% Critical H Value (KM-Log)	2.09
KM Standard Error of Mean (logged)	0.0454		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.504	Mean in Log Scale	-1.955
SD in Original Scale	5.514	SD in Log Scale	1.111
95% t UCL (Assumes normality)	0.922	95% H-Stat UCL	0.293

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Detected Data appear Approximate Lognormal Distributed at 5% Significance Level

Suggested UCL to Use

KM H-UCL	0.286

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

APPENDIX B-1A1
Metals in Soil - All Areas Except for Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - milligrams per kilogram (mg/kg)

Cadmium

General Statistics			
Total Number of Observations	473	Number of Distinct Observations	176
Number of Detects	421	Number of Non-Detects	52
Number of Distinct Detects	158	Number of Distinct Non-Detects	24
Minimum Detect	0.038	Minimum Non-Detect	0.025
Maximum Detect	51	Maximum Non-Detect	0.25
Variance Detects	12.76	Percent Non-Detects	10.99%
Mean Detects	1.814	SD Detects	3.572
Median Detects	0.73	CV Detects	1.969
Skewness Detects	7.694	Kurtosis Detects	90.08
Mean of Logged Detects	-0.247	SD of Logged Detects	1.277

Normal GOF Test on Detects Only			
Shapiro Wilk Test Statistic	0.473	Normal GOF Test on Detected Observations Only	
5% Shapiro Wilk P Value	0	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.309	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.0436	Detected Data Not Normal at 5% Significance Level	
Detected Data Not Normal at 5% Significance Level			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
KM Mean	1.619	KM Standard Error of Mean	0.157
KM SD	3.411	95% KM (BCA) UCL	1.896
95% KM (t) UCL	1.88E+00	95% KM (Percentile Bootstrap) UCL	1.89
95% KM (z) UCL	1.878	95% KM Bootstrap t UCL	1.981
90% KM Chebyshev UCL	2.09	95% KM Chebyshev UCL	2.304
97.5% KM Chebyshev UCL	2.6	99% KM Chebyshev UCL	3.182

Gamma GOF Tests on Detected Observations Only			
A-D Test Statistic	10.64	Anderson-Darling GOF Test	
5% A-D Critical Value	0.801	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.133	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.0461	Detected Data Not Gamma Distributed at 5% Significance Level	
Detected Data Not Gamma Distributed at 5% Significance Level			

Gamma Statistics on Detected Data Only			
k hat (MLE)	0.715	k star (bias corrected MLE)	0.712
Theta hat (MLE)	2.537	Theta star (bias corrected MLE)	2.55
nu hat (MLE)	602.2	nu star (bias corrected)	599.2
Mean (detects)	1.814		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	1.616
Maximum	51	Median	0.59
SD	3.417	CV	2.114
k hat (MLE)	0.523	k star (bias corrected MLE)	0.521
Theta hat (MLE)	3.09	Theta star (bias corrected MLE)	3.101
nu hat (MLE)	494.8	nu star (bias corrected)	493
Adjusted Level of Significance (β)	0.0495		
Approximate Chi Square Value (493.03, α)	442.5	Adjusted Chi Square Value (493.03, β)	442.4
95% Gamma Approximate UCL (use when n>=50)	1.8	95% Gamma Adjusted UCL (use when n<50)	1.801

Estimates of Gamma Parameters using KM Estimates			
Mean (KM)	1.619	SD (KM)	3.411
Variance (KM)	11.64	SE of Mean (KM)	0.157
k hat (KM)	0.225	k star (KM)	0.225
nu hat (KM)	213.1	nu star (KM)	213.1
theta hat (KM)	7.187	theta star (KM)	7.188
80% gamma percentile (KM)	2.258	90% gamma percentile (KM)	4.888
95% gamma percentile (KM)	8.078	99% gamma percentile (KM)	16.7

APPENDIX B-1A1
Metals in Soil - All Areas Except for Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - milligrams per kilogram (mg/kg)

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (213.12, α)	180.3	Adjusted Chi Square Value (213.12, β)	180.2
95% Gamma Approximate KM-UCL (use when n>=50)	1.914	95% Gamma Adjusted KM-UCL (use when n<50)	1.915

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Approximate Test Statistic	0.981	Shapiro Wilk GOF Test	
5% Shapiro Wilk P Value	0.158	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.0377	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.0436	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	1.621	Mean in Log Scale	-0.548
SD in Original Scale	3.414	SD in Log Scale	1.487
95% t UCL (assumes normality of ROS data)	1.88	95% Percentile Bootstrap UCL	1.887
95% BCA Bootstrap UCL	1.96	95% Bootstrap t UCL	1.952
95% H-UCL (Log ROS)	2.077		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-0.602	KM Geo Mean	0.548
KM SD (logged)	1.582	95% Critical H Value (KM-Log)	2.632
KM Standard Error of Mean (logged)	0.0731	95% H-UCL (KM -Log)	2.318
KM SD (logged)	1.582	95% Critical H Value (KM-Log)	2.632
KM Standard Error of Mean (logged)	0.0731		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	1.619	Mean in Log Scale	-0.615
SD in Original Scale	3.415	SD in Log Scale	1.616
95% t UCL (Assumes normality)	1.878	95% H-Stat UCL	2.432

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Detected Data appear Lognormal Distributed at 5% Significance Level

Suggested UCL to Use

KM H-UCL	2.318

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

APPENDIX B-1A1
Metals in Soil - All Areas Except for Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - milligrams per kilogram (mg/kg)

Chromium

General Statistics			
Total Number of Observations	473	Number of Distinct Observations	133
		Number of Missing Observations	0
Minimum	1.7	Mean	69.83
Maximum	4700	Median	27
SD	303.1	Std. Error of Mean	13.94
Coefficient of Variation	4.34	Skewness	12.92
Normal GOF Test			
Shapiro Wilk Test Statistic	0.17	Shapiro Wilk GOF Test	
5% Shapiro Wilk P Value	0	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.412	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.0411	Data Not Normal at 5% Significance Level	
Data Not Normal at 5% Significance Level			
Assuming Normal Distribution			
95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	92.8	95% Adjusted-CLT UCL (Chen-1995)	101.6
		95% Modified-t UCL (Johnson-1978)	94.18
Gamma GOF Test			
A-D Test Statistic	2.11E+28	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.802	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.197	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.0436	Data Not Gamma Distributed at 5% Significance Level	
Data Not Gamma Distributed at 5% Significance Level			
Gamma Statistics			
k hat (MLE)	0.705	k star (bias corrected MLE)	0.702
Theta hat (MLE)	99.11	Theta star (bias corrected MLE)	99.55
nu hat (MLE)	666.5	nu star (bias corrected)	663.7
MLE Mean (bias corrected)	69.83	MLE Sd (bias corrected)	83.38
		Approximate Chi Square Value (0.05)	604.9
Adjusted Level of Significance	0.0495	Adjusted Chi Square Value	604.7
Assuming Gamma Distribution			
95% Approximate Gamma UCL (use when n>=50))	76.62	95% Adjusted Gamma UCL (use when n<50)	76.64
Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.945	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk P Value	0	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.0596	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.0411	Data Not Lognormal at 5% Significance Level	
Data Not Lognormal at 5% Significance Level			
Lognormal Statistics			
Minimum of Logged Data	0.531	Mean of logged Data	3.389
Maximum of Logged Data	8.455	SD of logged Data	0.979
Assuming Lognormal Distribution			
95% H-UCL	52.58	90% Chebyshev (MVUE) UCL	55.6
95% Chebyshev (MVUE) UCL	59.13	97.5% Chebyshev (MVUE) UCL	64.04
99% Chebyshev (MVUE) UCL	73.69		
Nonparametric Distribution Free UCL Statistics			
Data do not follow a Discernible Distribution (0.05)			
Nonparametric Distribution Free UCLs			
95% CLT UCL	92.76	95% Jackknife UCL	92.8
95% Standard Bootstrap UCL	93.16	95% Bootstrap-t UCL	130.3
95% Hall's Bootstrap UCL	192.7	95% Percentile Bootstrap UCL	95.17
95% BCA Bootstrap UCL	105.5		
90% Chebyshev(Mean, Sd) UCL	111.6	95% Chebyshev(Mean, Sd) UCL	130.6
97.5% Chebyshev(Mean, Sd) UCL	156.9	99% Chebyshev(Mean, Sd) UCL	208.5

APPENDIX B-1A1
Metals in Soil - All Areas Except for Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - milligrams per kilogram (mg/kg)

Suggested UCL to Use	
95% Chebyshev (Mean, Sd) UCL	130.6

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

APPENDIX B-1A1
Metals in Soil - All Areas Except for Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - milligrams per kilogram (mg/kg)

Cobalt

General Statistics			
Total Number of Observations	473	Number of Distinct Observations	80
		Number of Missing Observations	0
Minimum	0.58	Mean	21.01
Maximum	4400	Median	11
SD	201.8	Std. Error of Mean	9.28
Coefficient of Variation	9.605	Skewness	21.73
Normal GOF Test			
Shapiro Wilk Test Statistic	0.0559	Shapiro Wilk GOF Test	
5% Shapiro Wilk P Value	0	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.472	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.0411	Data Not Normal at 5% Significance Level	
Data Not Normal at 5% Significance Level			
Assuming Normal Distribution			
95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	36.31	95% Adjusted-CLT UCL (Chen-1995)	46.19
		95% Modified-t UCL (Johnson-1978)	37.85
Gamma GOF Test			
A-D Test Statistic	2.11E+28	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.79	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.355	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.0432	Data Not Gamma Distributed at 5% Significance Level	
Data Not Gamma Distributed at 5% Significance Level			
Gamma Statistics			
k hat (MLE)	0.901	k star (bias corrected MLE)	0.897
Theta hat (MLE)	23.31	Theta star (bias corrected MLE)	23.43
nu hat (MLE)	852.6	nu star (bias corrected)	848.6
MLE Mean (bias corrected)	21.01	MLE Sd (bias corrected)	22.19
		Approximate Chi Square Value (0.05)	782
Adjusted Level of Significance	0.0495	Adjusted Chi Square Value	781.8
Assuming Gamma Distribution			
95% Approximate Gamma UCL (use when n>=50))	22.8	95% Adjusted Gamma UCL (use when n<50)	22.81
Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.823	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk P Value	0	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.134	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.0411	Data Not Lognormal at 5% Significance Level	
Data Not Lognormal at 5% Significance Level			
Lognormal Statistics			
Minimum of Logged Data	-0.545	Mean of logged Data	2.397
Maximum of Logged Data	8.389	SD of logged Data	0.492
Assuming Lognormal Distribution			
95% H-UCL	12.91	90% Chebyshev (MVUE) UCL	13.28
95% Chebyshev (MVUE) UCL	13.68	97.5% Chebyshev (MVUE) UCL	14.24
99% Chebyshev (MVUE) UCL	15.34		
Nonparametric Distribution Free UCL Statistics			
Data do not follow a Discernible Distribution (0.05)			
Nonparametric Distribution Free UCLs			
95% CLT UCL	36.28	95% Jackknife UCL	36.31
95% Standard Bootstrap UCL	36.19	95% Bootstrap-t UCL	438.1
95% Hall's Bootstrap UCL	112.7	95% Percentile Bootstrap UCL	39.63
95% BCA Bootstrap UCL	49.06		
90% Chebyshev(Mean, Sd) UCL	48.86	95% Chebyshev(Mean, Sd) UCL	61.47
97.5% Chebyshev(Mean, Sd) UCL	78.97	99% Chebyshev(Mean, Sd) UCL	113.4

APPENDIX B-1A1
Metals in Soil - All Areas Except for Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - milligrams per kilogram (mg/kg)

Suggested UCL to Use			
95% Student's-t UCL	36.31	or 95% Modified-t UCL	37.85

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

APPENDIX B-1A1
Metals in Soil - All Areas Except for Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - milligrams per kilogram (mg/kg)

Copper

General Statistics			
Total Number of Observations	474	Number of Distinct Observations	150
		Number of Missing Observations	0
Minimum	5.6	Mean	724.2
Maximum	120000	Median	135
SD	6266	Std. Error of Mean	287.8
Coefficient of Variation	8.653	Skewness	16.68
Normal GOF Test			
Shapiro Wilk Test Statistic	0.0987	Shapiro Wilk GOF Test	
5% Shapiro Wilk P Value	0	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.454	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.0411	Data Not Normal at 5% Significance Level	
Data Not Normal at 5% Significance Level			
Assuming Normal Distribution			
95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	1199	95% Adjusted-CLT UCL (Chen-1995)	1433
		95% Modified-t UCL (Johnson-1978)	1235
Gamma GOF Test			
A-D Test Statistic	2.11E+28	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.841	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.291	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.0446	Data Not Gamma Distributed at 5% Significance Level	
Data Not Gamma Distributed at 5% Significance Level			
Gamma Statistics			
k hat (MLE)	0.423	k star (bias corrected MLE)	0.422
Theta hat (MLE)	1713	Theta star (bias corrected MLE)	1718
nu hat (MLE)	400.8	nu star (bias corrected)	399.6
MLE Mean (bias corrected)	724.2	MLE Sd (bias corrected)	1115
		Approximate Chi Square Value (0.05)	354.2
Adjusted Level of Significance	0.0495	Adjusted Chi Square Value	354.1
Assuming Gamma Distribution			
95% Approximate Gamma UCL (use when n>=50))	816.9	95% Adjusted Gamma UCL (use when n<50)	817.2
Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.937	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk P Value	0	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	1.16E-01	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.0411	Data Not Lognormal at 5% Significance Level	
Data Not Lognormal at 5% Significance Level			
Lognormal Statistics			
Minimum of Logged Data	1.723	Mean of logged Data	5.042
Maximum of Logged Data	11.7	SD of logged Data	1.169
Assuming Lognormal Distribution			
95% H-UCL	346.1	90% Chebyshev (MVUE) UCL	369.5
95% Chebyshev (MVUE) UCL	398.3	97.5% Chebyshev (MVUE) UCL	438.2
99% Chebyshev (MVUE) UCL	516.7		
Nonparametric Distribution Free UCL Statistics			
Data do not follow a Discernible Distribution (0.05)			
Nonparametric Distribution Free UCLs			
95% CLT UCL	1198	95% Jackknife UCL	1199
95% Standard Bootstrap UCL	1198	95% Bootstrap-t UCL	4295
95% Hall's Bootstrap UCL	3272	95% Percentile Bootstrap UCL	1250
95% BCA Bootstrap UCL	1605		
90% Chebyshev(Mean, Sd) UCL	1588	95% Chebyshev(Mean, Sd) UCL	1979
97.5% Chebyshev(Mean, Sd) UCL	2522	99% Chebyshev(Mean, Sd) UCL	3588

APPENDIX B-1A1
Metals in Soil - All Areas Except for Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - milligrams per kilogram (mg/kg)

Suggested UCL to Use	
95% Chebyshev (Mean, Sd) UCL	1979

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

APPENDIX B-1A1
Metals in Soil - All Areas Except for Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - milligrams per kilogram (mg/kg)

Lead

General Statistics			
Total Number of Observations	474	Number of Distinct Observations	209
		Number of Missing Observations	0
Minimum	0.39	Mean	692.7
Maximum	19000	Median	150
SD	1845	Std. Error of Mean	84.73
Coefficient of Variation	2.663	Skewness	5.87
Normal GOF Test			
Shapiro Wilk Test Statistic	0.397	Shapiro Wilk GOF Test	
5% Shapiro Wilk P Value	0	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.354	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.0411	Data Not Normal at 5% Significance Level	
Data Not Normal at 5% Significance Level			
Assuming Normal Distribution			
95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	832.3	95% Adjusted-CLT UCL (Chen-1995)	856.5
		95% Modified-t UCL (Johnson-1978)	836.1
Gamma GOF Test			
A-D Test Statistic	15.86	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.847	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.143	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.0447	Data Not Gamma Distributed at 5% Significance Level	
Data Not Gamma Distributed at 5% Significance Level			
Gamma Statistics			
k hat (MLE)	0.402	k star (bias corrected MLE)	0.401
Theta hat (MLE)	1723	Theta star (bias corrected MLE)	1728
nu hat (MLE)	381.1	nu star (bias corrected)	380
MLE Mean (bias corrected)	692.7	MLE Sd (bias corrected)	1094
		Approximate Chi Square Value (0.05)	335.8
Adjusted Level of Significance	0.0495	Adjusted Chi Square Value	335.7
Assuming Gamma Distribution			
95% Approximate Gamma UCL (use when n>=50))	783.8	95% Adjusted Gamma UCL (use when n<50)	784.1
Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.981	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk P Value	0.118	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.0483	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.0411	Data Not Lognormal at 5% Significance Level	
Data appear Approximate Lognormal at 5% Significance Level			
Lognormal Statistics			
Minimum of Logged Data	-0.942	Mean of logged Data	4.905
Maximum of Logged Data	9.852	SD of logged Data	1.921
Assuming Lognormal Distribution			
95% H-UCL	1112	90% Chebyshev (MVUE) UCL	1215
95% Chebyshev (MVUE) UCL	1382	97.5% Chebyshev (MVUE) UCL	1615
99% Chebyshev (MVUE) UCL	2072		
Nonparametric Distribution Free UCL Statistics			
Data appear to follow a Discernible Distribution at 5% Significance Level			
Nonparametric Distribution Free UCLs			
95% CLT UCL	832.1	95% Jackknife UCL	832.3
95% Standard Bootstrap UCL	837.1	95% Bootstrap-t UCL	854.7
95% Hall's Bootstrap UCL	853.5	95% Percentile Bootstrap UCL	832
95% BCA Bootstrap UCL	862.5		
90% Chebyshev(Mean, Sd) UCL	946.9	95% Chebyshev(Mean, Sd) UCL	1062
97.5% Chebyshev(Mean, Sd) UCL	1222	99% Chebyshev(Mean, Sd) UCL	1536

APPENDIX B-1A1
Metals in Soil - All Areas Except for Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - milligrams per kilogram (mg/kg)

Suggested UCL to Use	
95% H-UCL	1112

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

ProUCL computes and outputs H-statistic based UCLs for historical reasons only.
H-statistic often results in unstable (both high and low) values of UCL95 as shown in examples in the Technical Guide.
It is therefore recommended to avoid the use of H-statistic based 95% UCLs.
Use of nonparametric methods are preferred to compute UCL95 for skewed data sets which do not follow a gamma distribution.

APPENDIX B-1A1
Metals in Soil - All Areas Except for Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - milligrams per kilogram (mg/kg)

Mercury

General Statistics			
Total Number of Observations	473	Number of Distinct Observations	158
Number of Detects	467	Number of Non-Detects	6
Number of Distinct Detects	158	Number of Distinct Non-Detects	3
Minimum Detect	0.0022	Minimum Non-Detect	0.071
Maximum Detect	22	Maximum Non-Detect	0.1
Variance Detects	2.586	Percent Non-Detects	1.27%
Mean Detects	0.49	SD Detects	1.608
Median Detects	0.16	CV Detects	3.281
Skewness Detects	9.658	Kurtosis Detects	106.7
Mean of Logged Detects	-1.673	SD of Logged Detects	1.179

Normal GOF Test on Detects Only			
Shapiro Wilk Test Statistic	0.257	Normal GOF Test on Detected Observations Only	
5% Shapiro Wilk P Value	0	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.382	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.0414	Detected Data Not Normal at 5% Significance Level	
Detected Data Not Normal at 5% Significance Level			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
KM Mean	0.485	KM Standard Error of Mean	0.0735
KM SD	1.597	95% KM (BCA) UCL	0.618
95% KM (t) UCL	0.606	95% KM (Percentile Bootstrap) UCL	0.615
95% KM (z) UCL	0.605	95% KM Bootstrap t UCL	0.694
90% KM Chebyshev UCL	0.705	95% KM Chebyshev UCL	0.805
97.5% KM Chebyshev UCL	0.944	99% KM Chebyshev UCL	1.216

Gamma GOF Tests on Detected Observations Only			
A-D Test Statistic	27.41	Anderson-Darling GOF Test	
5% A-D Critical Value	0.809	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.18	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.044	Detected Data Not Gamma Distributed at 5% Significance Level	
Detected Data Not Gamma Distributed at 5% Significance Level			

Gamma Statistics on Detected Data Only			
k hat (MLE)	0.638	k star (bias corrected MLE)	0.636
Theta hat (MLE)	0.768	Theta star (bias corrected MLE)	0.771
nu hat (MLE)	596.1	nu star (bias corrected)	593.6
Mean (detects)	0.49		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.0022	Mean	0.484
Maximum	22	Median	0.16
SD	1.599	CV	3.303
k hat (MLE)	0.624	k star (bias corrected MLE)	0.622
Theta hat (MLE)	0.775	Theta star (bias corrected MLE)	0.778
nu hat (MLE)	590.5	nu star (bias corrected)	588.1
Adjusted Level of Significance (β)	0.0495		
Approximate Chi Square Value (588.12, α)	532.9	Adjusted Chi Square Value (588.12, β)	532.7
95% Gamma Approximate UCL (use when n>=50)	0.534	95% Gamma Adjusted UCL (use when n<50)	0.534

Estimates of Gamma Parameters using KM Estimates			
Mean (KM)	0.485	SD (KM)	1.597
Variance (KM)	2.55	SE of Mean (KM)	0.0735
k hat (KM)	0.0921	k star (KM)	0.0929
nu hat (KM)	87.11	nu star (KM)	87.89
theta hat (KM)	5.262	theta star (KM)	5.216
80% gamma percentile (KM)	3.01E-01	90% gamma percentile (KM)	1.248
95% gamma percentile (KM)	2.821	99% gamma percentile (KM)	7.983

APPENDIX B-1A1
Metals in Soil - All Areas Except for Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - milligrams per kilogram (mg/kg)

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (87.89, α)	67.28	Adjusted Chi Square Value (87.89, β)	67.22
95% Gamma Approximate KM-UCL (use when n>=50)	0.633	95% Gamma Adjusted KM-UCL (use when n<50)	0.634

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Approximate Test Statistic	0.97	Shapiro Wilk GOF Test	
5% Shapiro Wilk P Value	2.83E-05	Detected Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.0743	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.0414	Detected Data Not Lognormal at 5% Significance Level	

Detected Data Not Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.485	Mean in Log Scale	-1.689
SD in Original Scale	1.599	SD in Log Scale	1.181
95% t UCL (assumes normality of ROS data)	0.606	95% Percentile Bootstrap UCL	0.606
95% BCA Bootstrap UCL	0.665	95% Bootstrap t UCL	0.669
95% H-UCL (Log ROS)	0.419		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-1.689	KM Geo Mean	0.185
KM SD (logged)	1.18	95% Critical H Value (KM-Log)	2.257
KM Standard Error of Mean (logged)	0.0544	95% H-UCL (KM -Log)	0.419
KM SD (logged)	1.18	95% Critical H Value (KM-Log)	2.257
KM Standard Error of Mean (logged)	0.0544		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.484	Mean in Log Scale	-1.691
SD in Original Scale	1.599	SD in Log Scale	1.182
95% t UCL (Assumes normality)	0.606	95% H-Stat UCL	0.42

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Data do not follow a Discernible Distribution at 5% Significance Level

Suggested UCL to Use

95% KM (Chebyshev) UCL	0.805

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

APPENDIX B-1A1
Metals in Soil - All Areas Except for Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - milligrams per kilogram (mg/kg)

Molybdenum

General Statistics			
Total Number of Observations	473	Number of Distinct Observations	148
Number of Detects	360	Number of Non-Detects	113
Number of Distinct Detects	145	Number of Distinct Non-Detects	23
Minimum Detect	0.16	Minimum Non-Detect	0.13
Maximum Detect	250	Maximum Non-Detect	2
Variance Detects	227.3	Percent Non-Detects	23.89%
Mean Detects	3.63	SD Detects	15.08
Median Detects	1	CV Detects	4.154
Skewness Detects	13.05	Kurtosis Detects	202.4
Mean of Logged Detects	0.177	SD of Logged Detects	1.201

Normal GOF Test on Detects Only			
Shapiro Wilk Test Statistic	0.216	Normal GOF Test on Detected Observations Only	
5% Shapiro Wilk P Value	0	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.409	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.0471	Detected Data Not Normal at 5% Significance Level	
Detected Data Not Normal at 5% Significance Level			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
KM Mean	2.811	KM Standard Error of Mean	0.609
KM SD	13.22	95% KM (BCA) UCL	4.03
95% KM (t) UCL	3.814	95% KM (Percentile Bootstrap) UCL	3.834
95% KM (z) UCL	3.812	95% KM Bootstrap t UCL	4.929
90% KM Chebyshev UCL	4.636	95% KM Chebyshev UCL	5.463
97.5% KM Chebyshev UCL	6.611	99% KM Chebyshev UCL	8.866

Gamma GOF Tests on Detected Observations Only			
A-D Test Statistic	2.78E+28	Anderson-Darling GOF Test	
5% A-D Critical Value	0.816	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.206	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.0505	Detected Data Not Gamma Distributed at 5% Significance Level	
Detected Data Not Gamma Distributed at 5% Significance Level			

Gamma Statistics on Detected Data Only			
k hat (MLE)	0.561	k star (bias corrected MLE)	0.558
Theta hat (MLE)	6.469	Theta star (bias corrected MLE)	6.501
nu hat (MLE)	404	nu star (bias corrected)	402
Mean (detects)	3.63		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	2.765
Maximum	250	Median	0.67
SD	13.24	CV	4.789
k hat (MLE)	0.341	k star (bias corrected MLE)	0.34
Theta hat (MLE)	8.116	Theta star (bias corrected MLE)	8.134
nu hat (MLE)	322.3	nu star (bias corrected)	321.6
Adjusted Level of Significance (β)	0.0495		
Approximate Chi Square Value (321.57, α)	281	Adjusted Chi Square Value (321.57, β)	280.9
95% Gamma Approximate UCL (use when n>=50)	3.164	95% Gamma Adjusted UCL (use when n<50)	3.165

Estimates of Gamma Parameters using KM Estimates			
Mean (KM)	2.811	SD (KM)	13.22
Variance (KM)	174.7	SE of Mean (KM)	0.609
k hat (KM)	0.0452	k star (KM)	0.0463
nu hat (KM)	42.78	nu star (KM)	43.84
theta hat (KM)	62.15	theta star (KM)	60.65
80% gamma percentile (KM)	0.288	90% gamma percentile (KM)	3.864
95% gamma percentile (KM)	14.51	99% gamma percentile (KM)	62.97

APPENDIX B-1A1
Metals in Soil - All Areas Except for Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - milligrams per kilogram (mg/kg)

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (43.84, α)	29.66	Adjusted Chi Square Value (43.84, β)	29.62
95% Gamma Approximate KM-UCL (use when n>=50)	4.155	95% Gamma Adjusted KM-UCL (use when n<50)	4.16

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Approximate Test Statistic	0.941	Shapiro Wilk GOF Test	
5% Shapiro Wilk P Value	0.00E+00	Detected Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.0938	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.0471	Detected Data Not Lognormal at 5% Significance Level	

Detected Data Not Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	2.799	Mean in Log Scale	-0.394
SD in Original Scale	13.23	SD in Log Scale	1.511
95% t UCL (assumes normality of ROS data)	3.802	95% Percentile Bootstrap UCL	3.883
95% BCA Bootstrap UCL	4.388	95% Bootstrap t UCL	4.971
95% H-UCL (Log ROS)	2.526		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-0.291	KM Geo Mean	0.747
KM SD (logged)	1.361	95% Critical H Value (KM-Log)	2.419
KM Standard Error of Mean (logged)	0.0633	95% H-UCL (KM -Log)	2.197
KM SD (logged)	1.361	95% Critical H Value (KM-Log)	2.419
KM Standard Error of Mean (logged)	0.0633		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	2.809	Mean in Log Scale	-0.329
SD in Original Scale	13.23	SD in Log Scale	1.428
95% t UCL (Assumes normality)	3.812	95% H-Stat UCL	2.346

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Data do not follow a Discernible Distribution at 5% Significance Level

Suggested UCL to Use

95% KM (Chebyshev) UCL	5.463

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

APPENDIX B-1A1
Metals in Soil - All Areas Except for Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - milligrams per kilogram (mg/kg)

Nickel

General Statistics

Total Number of Observations	473	Number of Distinct Observations	151
		Number of Missing Observations	0
Minimum	1.7	Mean	52.16
Maximum	2900	Median	28
SD	165	Std. Error of Mean	758.90%
Coefficient of Variation	3.164	Skewness	13.65

Normal GOF Test

Shapiro Wilk Test Statistic	0.229	Shapiro Wilk GOF Test	
5% Shapiro Wilk P Value	0	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.38	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.0411	Data Not Normal at 5% Significance Level	
Data Not Normal at 5% Significance Level			

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	64.66	95% Adjusted-CLT UCL (Chen-1995)	69.73
		95% Modified-t UCL (Johnson-1978)	65.46

Gamma GOF Test

A-D Test Statistic	2.11E+28	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.794	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.127	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.0433	Data Not Gamma Distributed at 5% Significance Level	
Data Not Gamma Distributed at 5% Significance Level			

Gamma Statistics

k hat (MLE)	0.811	k star (bias corrected MLE)	0.808
Theta hat (MLE)	64.29	Theta star (bias corrected MLE)	64.59
nu hat (MLE)	767.5	nu star (bias corrected)	763.9
MLE Mean (bias corrected)	52.16	MLE Sd (bias corrected)	58.04
		Approximate Chi Square Value (0.05)	700.8
Adjusted Level of Significance	0.0495	Adjusted Chi Square Value	700.6

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	56.86	95% Adjusted Gamma UCL (use when n<50)	56.87

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.978	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk P Value	0.0263	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.0595	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.0411	Data Not Lognormal at 5% Significance Level	
Data Not Lognormal at 5% Significance Level			

Lognormal Statistics

Minimum of Logged Data	0.531	Mean of logged Data	3.224
Maximum of Logged Data	7.972	SD of logged Data	1.088

Assuming Lognormal Distribution

95% H-UCL	50.65	90% Chebyshev (MVUE) UCL	53.86
95% Chebyshev (MVUE) UCL	57.73	97.5% Chebyshev (MVUE) UCL	63.09
99% Chebyshev (MVUE) UCL	73.63		

Nonparametric Distribution Free UCL Statistics
Data do not follow a Discernible Distribution (0.05)

Nonparametric Distribution Free UCLs

95% CLT UCL	64.64	95% Jackknife UCL	64.66
95% Standard Bootstrap UCL	64.58	95% Bootstrap-t UCL	84.02
95% Hall's Bootstrap UCL	123.7	95% Percentile Bootstrap UCL	65.53
95% BCA Bootstrap UCL	71.51		
90% Chebyshev(Mean, Sd) UCL	74.92	95% Chebyshev(Mean, Sd) UCL	85.24
97.5% Chebyshev(Mean, Sd) UCL	99.55	99% Chebyshev(Mean, Sd) UCL	127.7

APPENDIX B-1A1
Metals in Soil - All Areas Except for Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - milligrams per kilogram (mg/kg)

Suggested UCL to Use	
95% Chebyshev (Mean, Sd) UCL	85.24

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

APPENDIX B-1A1
Metals in Soil - All Areas Except for Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - milligrams per kilogram (mg/kg)

Selenium

General Statistics			
Total Number of Observations	473	Number of Distinct Observations	107
Number of Detects	281	Number of Non-Detects	192
Number of Distinct Detects	91	Number of Distinct Non-Detects	45
Minimum Detect	0.35	Minimum Non-Detect	0.24
Maximum Detect	15	Maximum Non-Detect	220
Variance Detects	3.171	Percent Non-Detects	40.59%
Mean Detects	1.867	SD Detects	1.781
Median Detects	1.4	CV Detects	0.954
Skewness Detects	3.297	Kurtosis Detects	15.25
Mean of Logged Detects	0.337	SD of Logged Detects	0.723

Normal GOF Test on Detects Only			
Shapiro Wilk Test Statistic	0.691	Normal GOF Test on Detected Observations Only	
5% Shapiro Wilk P Value	0	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.197	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.0533	Detected Data Not Normal at 5% Significance Level	
Detected Data Not Normal at 5% Significance Level			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
KM Mean	1.255	KM Standard Error of Mean	0.0728
KM SD	1.571	95% KM (BCA) UCL	1.381
95% KM (t) UCL	1.375	95% KM (Percentile Bootstrap) UCL	1.378
95% KM (z) UCL	1.374	95% KM Bootstrap t UCL	1.386
90% KM Chebyshev UCL	1.473	95% KM Chebyshev UCL	1.572
97.5% KM Chebyshev UCL	1.71	99% KM Chebyshev UCL	1.979

Gamma GOF Tests on Detected Observations Only			
A-D Test Statistic	4.512	Anderson-Darling GOF Test	
5% A-D Critical Value	0.767	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.096	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.0551	Detected Data Not Gamma Distributed at 5% Significance Level	
Detected Data Not Gamma Distributed at 5% Significance Level			

Gamma Statistics on Detected Data Only			
k hat (MLE)	1.893	k star (bias corrected MLE)	1.875
Theta hat (MLE)	0.986	Theta star (bias corrected MLE)	0.996
nu hat (MLE)	1064	nu star (bias corrected)	1054
Mean (detects)	1.867		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	1.141
Maximum	15	Median	0.66
SD	1.638	CV	1.435
k hat (MLE)	0.401	k star (bias corrected MLE)	0.4
Theta hat (MLE)	2.847	Theta star (bias corrected MLE)	2.856
nu hat (MLE)	379.2	nu star (bias corrected)	378.1
Adjusted Level of Significance (β)	0.0495		
Approximate Chi Square Value (378.12, α)	334.1	Adjusted Chi Square Value (378.12, β)	333.9
95% Gamma Approximate UCL (use when n>=50)	1.292	95% Gamma Adjusted UCL (use when n<50)	1.292

Estimates of Gamma Parameters using KM Estimates			
Mean (KM)	1.255	SD (KM)	1.571
Variance (KM)	2.467	SE of Mean (KM)	0.0728
k hat (KM)	0.638	k star (KM)	0.635
nu hat (KM)	603.5	nu star (KM)	601
theta hat (KM)	1.966	theta star (KM)	1.975
80% gamma percentile (KM)	2.067	90% gamma percentile (KM)	3.221
95% gamma percentile (KM)	4.422	99% gamma percentile (KM)	7.314

APPENDIX B-1A1
Metals in Soil - All Areas Except for Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - milligrams per kilogram (mg/kg)

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (601.04, α)	545.2	Adjusted Chi Square Value (601.04, β)	545
95% Gamma Approximate KM-UCL (use when n>=50)	1.383	95% Gamma Adjusted KM-UCL (use when n<50)	1.384

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Approximate Test Statistic	0.965	Shapiro Wilk GOF Test	
5% Shapiro Wilk P Value	1.59E-04	Detected Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.0476	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.0533	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Approximate Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	1.252	Mean in Log Scale	-0.284
SD in Original Scale	1.567	SD in Log Scale	0.994
95% t UCL (assumes normality of ROS data)	1.371	95% Percentile Bootstrap UCL	1.373
95% BCA Bootstrap UCL	1.384	95% Bootstrap t UCL	1.384
95% H-UCL (Log ROS)	1.358		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-0.278	KM Geo Mean	0.757
KM SD (logged)	0.974	95% Critical H Value (KM-Log)	2.088
KM Standard Error of Mean (logged)	0.0473	95% H-UCL (KM -Log)	1.336
KM SD (logged)	0.974	95% Critical H Value (KM-Log)	2.088
KM Standard Error of Mean (logged)	0.0473		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	1.499	Mean in Log Scale	-0.275
SD in Original Scale	5.241	SD in Log Scale	1.042
95% t UCL (Assumes normality)	1.896	95% H-Stat UCL	1.449

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Detected Data appear Approximate Lognormal Distributed at 5% Significance Level

Suggested UCL to Use

KM H-UCL	1.336

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

APPENDIX B-1A1
Metals in Soil - All Areas Except for Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - milligrams per kilogram (mg/kg)

Silver

General Statistics			
Total Number of Observations	473	Number of Distinct Observations	118
Number of Detects	204	Number of Non-Detects	269
Number of Distinct Detects	111	Number of Distinct Non-Detects	24
Minimum Detect	0.12	Minimum Non-Detect	0.1
Maximum Detect	17	Maximum Non-Detect	73
Variance Detects	5.912	Percent Non-Detects	56.87%
Mean Detects	1.576	SD Detects	2.431
Median Detects	0.655	CV Detects	1.543
Skewness Detects	2.993	Kurtosis Detects	10.88
Mean of Logged Detects	-0.272	SD of Logged Detects	1.124

Normal GOF Test on Detects Only			
Shapiro Wilk Test Statistic	0.604	Normal GOF Test on Detected Observations Only	
5% Shapiro Wilk P Value	0	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.315	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.0625	Detected Data Not Normal at 5% Significance Level	
Detected Data Not Normal at 5% Significance Level			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
KM Mean	0.747	KM Standard Error of Mean	0.0809
KM SD	1.752	95% KM (BCA) UCL	0.888
95% KM (t) UCL	0.88	95% KM (Percentile Bootstrap) UCL	0.884
95% KM (z) UCL	0.88	95% KM Bootstrap t UCL	0.905
90% KM Chebyshev UCL	0.989	95% KM Chebyshev UCL	1.099
97.5% KM Chebyshev UCL	1.252	99% KM Chebyshev UCL	1.551

Gamma GOF Tests on Detected Observations Only			
A-D Test Statistic	11.03	Anderson-Darling GOF Test	
5% A-D Critical Value	0.793	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.215	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.0655	Detected Data Not Gamma Distributed at 5% Significance Level	
Detected Data Not Gamma Distributed at 5% Significance Level			

Gamma Statistics on Detected Data Only			
k hat (MLE)	0.815	k star (bias corrected MLE)	0.807
Theta hat (MLE)	1.933	Theta star (bias corrected MLE)	1.954
nu hat (MLE)	332.6	nu star (bias corrected)	329.1
Mean (detects)	1.576		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.688
Maximum	17	Median	0.01
SD	1.773	CV	2.576
k hat (MLE)	0.295	k star (bias corrected MLE)	0.295
Theta hat (MLE)	2.331	Theta star (bias corrected MLE)	2.335
nu hat (MLE)	279.3	nu star (bias corrected)	278.9
Adjusted Level of Significance (β)	0.0495		
Approximate Chi Square Value (278.89, α)	241.2	Adjusted Chi Square Value (278.89, β)	241.1
95% Gamma Approximate UCL (use when n>=50)	0.796	95% Gamma Adjusted UCL (use when n<50)	0.796

Estimates of Gamma Parameters using KM Estimates			
Mean (KM)	0.747	SD (KM)	1.752
Variance (KM)	3.069	SE of Mean (KM)	0.0809
k hat (KM)	0.182	k star (KM)	0.182
nu hat (KM)	171.9	nu star (KM)	172.2
theta hat (KM)	4.109	theta star (KM)	4.103
80% gamma percentile (KM)	0.933	90% gamma percentile (KM)	2.253
95% gamma percentile (KM)	3.94	99% gamma percentile (KM)	8.659

APPENDIX B-1A1
Metals in Soil - All Areas Except for Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - milligrams per kilogram (mg/kg)

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (172.17, α)	142.8	Adjusted Chi Square Value (172.17, β)	142.7
95% Gamma Approximate KM-UCL (use when n>=50)	0.9	95% Gamma Adjusted KM-UCL (use when n<50)	0.901

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Approximate Test Statistic	0.93	Shapiro Wilk GOF Test	
5% Shapiro Wilk P Value	1.25E-12	Detected Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.12	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.0625	Detected Data Not Lognormal at 5% Significance Level	

Detected Data Not Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.718	Mean in Log Scale	-1.928
SD in Original Scale	1.762	SD in Log Scale	1.817
95% t UCL (assumes normality of ROS data)	0.852	95% Percentile Bootstrap UCL	0.855
95% BCA Bootstrap UCL	0.859	95% Bootstrap t UCL	0.868
95% H-UCL (Log ROS)	0.963		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-1.379	KM Geo Mean	0.252
KM SD (logged)	1.234	95% Critical H Value (KM-Log)	2.303
KM Standard Error of Mean (logged)	0.0578	95% H-UCL (KM -Log)	0.614
KM SD (logged)	1.234	95% Critical H Value (KM-Log)	2.303
KM Standard Error of Mean (logged)	0.0578		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.824	Mean in Log Scale	-1.448
SD in Original Scale	2.403	SD in Log Scale	1.362
95% t UCL (Assumes normality)	1.006	95% H-Stat UCL	0.691

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Data do not follow a Discernible Distribution at 5% Significance Level

Suggested UCL to Use

95% KM (Chebyshev) UCL	1.099

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

APPENDIX B-1A1
Metals in Soil - All Areas Except for Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - milligrams per kilogram (mg/kg)

Thallium

General Statistics			
Total Number of Observations	441	Number of Distinct Observations	76
Number of Detects	80	Number of Non-Detects	361
Number of Distinct Detects	49	Number of Distinct Non-Detects	51
Minimum Detect	0.33	Minimum Non-Detect	0.24
Maximum Detect	11	Maximum Non-Detect	210
Variance Detects	1.62	Percent Non-Detects	81.86%
Mean Detects	1.192	SD Detects	1.273
Median Detects	0.86	CV Detects	1.068
Skewness Detects	6.079	Kurtosis Detects	45.37
Mean of Logged Detects	-0.0429	SD of Logged Detects	0.584

Normal GOF Test on Detects Only			
Shapiro Wilk Test Statistic	0.492	Normal GOF Test on Detected Observations Only	
5% Shapiro Wilk P Value	0	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.249	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.0991	Detected Data Not Normal at 5% Significance Level	
Detected Data Not Normal at 5% Significance Level			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
KM Mean	0.432	KM Standard Error of Mean	0.0321
KM SD	0.658	95% KM (BCA) UCL	0.492
95% KM (t) UCL	0.485	95% KM (Percentile Bootstrap) UCL	0.49
95% KM (z) UCL	0.485	95% KM Bootstrap t UCL	0.517
90% KM Chebyshev UCL	0.528	95% KM Chebyshev UCL	0.572
97.5% KM Chebyshev UCL	0.633	99% KM Chebyshev UCL	0.752

Gamma GOF Tests on Detected Observations Only			
A-D Test Statistic	2.431	Anderson-Darling GOF Test	
5% A-D Critical Value	0.761	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.131	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.101	Detected Data Not Gamma Distributed at 5% Significance Level	
Detected Data Not Gamma Distributed at 5% Significance Level			

Gamma Statistics on Detected Data Only			
k hat (MLE)	2.446	k star (bias corrected MLE)	2.363
Theta hat (MLE)	0.487	Theta star (bias corrected MLE)	0.504
nu hat (MLE)	391.4	nu star (bias corrected)	378
Mean (detects)	1.192		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.231
Maximum	11	Median	0.01
SD	0.709	CV	3.073
k hat (MLE)	0.302	k star (bias corrected MLE)	0.302
Theta hat (MLE)	0.763	Theta star (bias corrected MLE)	0.765
nu hat (MLE)	266.8	nu star (bias corrected)	266.3
Adjusted Level of Significance (β)	0.0495		
Approximate Chi Square Value (266.28, α)	229.5	Adjusted Chi Square Value (266.28, β)	229.4
95% Gamma Approximate UCL (use when n>=50)	0.268	95% Gamma Adjusted UCL (use when n<50)	0.268

Estimates of Gamma Parameters using KM Estimates			
Mean (KM)	0.432	SD (KM)	0.658
Variance (KM)	0.433	SE of Mean (KM)	0.0321
k hat (KM)	0.431	k star (KM)	0.43
nu hat (KM)	380.6	nu star (KM)	379.3
theta hat (KM)	1.001	theta star (KM)	1.005
80% gamma percentile (KM)	0.702	90% gamma percentile (KM)	1.204
95% gamma percentile (KM)	1.75	99% gamma percentile (KM)	3.113

APPENDIX B-1A1
Metals in Soil - All Areas Except for Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - milligrams per kilogram (mg/kg)

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (379.30, α)	335.2	Adjusted Chi Square Value (379.30, β)	335
95% Gamma Approximate KM-UCL (use when n>=50)	0.489	95% Gamma Adjusted KM-UCL (use when n<50)	0.489

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Approximate Test Statistic	0.951	Shapiro Wilk GOF Test	
5% Shapiro Wilk P Value	0.0116	Detected Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.0983	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.0991	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Approximate Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.353	Mean in Log Scale	-1.694
SD in Original Scale	0.679	SD in Log Scale	1.069
95% t UCL (assumes normality of ROS data)	0.406	95% Percentile Bootstrap UCL	0.411
95% BCA Bootstrap UCL	0.428	95% Bootstrap t UCL	0.432
95% H-UCL (Log ROS)	0.364		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-1.131	KM Geo Mean	0.323
KM SD (logged)	0.603	95% Critical H Value (KM-Log)	1.839
KM Standard Error of Mean (logged)	0.0315	95% H-UCL (KM -Log)	0.408
KM SD (logged)	0.603	95% Critical H Value (KM-Log)	1.839
KM Standard Error of Mean (logged)	0.0315		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.771	Mean in Log Scale	-1.07
SD in Original Scale	5.04	SD in Log Scale	0.853
95% t UCL (Assumes normality)	1.166	95% H-Stat UCL	0.535

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Detected Data appear Approximate Lognormal Distributed at 5% Significance Level

Suggested UCL to Use

KM H-UCL	0.408

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

APPENDIX B-1A1
Metals in Soil - All Areas Except for Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - milligrams per kilogram (mg/kg)

Vanadium

General Statistics			
Total Number of Observations	473	Number of Distinct Observations	95
		Number of Missing Observations	0
Minimum	1.6	Mean	162.1
Maximum	45000	Median	66
SD	2066	Std. Error of Mean	95.01
Coefficient of Variation	12.75	Skewness	21.74
Normal GOF Test			
Shapiro Wilk Test Statistic	0.0522	Shapiro Wilk GOF Test	
5% Shapiro Wilk P Value	0	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.494	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.0411	Data Not Normal at 5% Significance Level	
Data Not Normal at 5% Significance Level			
Assuming Normal Distribution			
95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	318.7	95% Adjusted-CLT UCL (Chen-1995)	419.9
		95% Modified-t UCL (Johnson-1978)	334.5
Gamma GOF Test			
A-D Test Statistic	2.11E+28	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.81	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.384	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.0438	Data Not Gamma Distributed at 5% Significance Level	
Data Not Gamma Distributed at 5% Significance Level			
Gamma Statistics			
k hat (MLE)	0.625	k star (bias corrected MLE)	0.623
Theta hat (MLE)	259.2	Theta star (bias corrected MLE)	260.3
nu hat (MLE)	591.6	nu star (bias corrected)	589.1
MLE Mean (bias corrected)	162.1	MLE Sd (bias corrected)	205.4
		Approximate Chi Square Value (0.05)	533.8
Adjusted Level of Significance	0.0495	Adjusted Chi Square Value	533.7
Assuming Gamma Distribution			
95% Approximate Gamma UCL (use when n>=50))	178.9	95% Adjusted Gamma UCL (use when n<50)	179
Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.867	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk P Value	0.00E+00	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.0977	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.0411	Data Not Lognormal at 5% Significance Level	
Data Not Lognormal at 5% Significance Level			
Lognormal Statistics			
Minimum of Logged Data	0.47	Mean of logged Data	4.106
Maximum of Logged Data	10.71	SD of logged Data	0.6
Assuming Lognormal Distribution			
95% H-UCL	76.5	90% Chebyshev (MVUE) UCL	79.21
95% Chebyshev (MVUE) UCL	82.16	97.5% Chebyshev (MVUE) UCL	86.27
99% Chebyshev (MVUE) UCL	94.33		
Nonparametric Distribution Free UCL Statistics			
Data do not follow a Discernible Distribution (0.05)			
Nonparametric Distribution Free UCLs			
95% CLT UCL	318.4	95% Jackknife UCL	318.7
95% Standard Bootstrap UCL	314.6	95% Bootstrap-t UCL	7032
95% Hall's Bootstrap UCL	1382	95% Percentile Bootstrap UCL	351.6
95% BCA Bootstrap UCL	448.9		
90% Chebyshev(Mean, Sd) UCL	447.1	95% Chebyshev(Mean, Sd) UCL	576.2
97.5% Chebyshev(Mean, Sd) UCL	755.4	99% Chebyshev(Mean, Sd) UCL	1107

APPENDIX B-1A1
Metals in Soil - All Areas Except for Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - milligrams per kilogram (mg/kg)

Suggested UCL to Use	
95% Chebyshev (Mean, Sd) UCL	576.2

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

APPENDIX B-1A1
Metals in Soil - All Areas Except for Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - milligrams per kilogram (mg/kg)

Zinc

General Statistics			
Total Number of Observations	474	Number of Distinct Observations	166
		Number of Missing Observations	0
Minimum	12	Mean	495.7
Maximum	18000	Median	170
SD	1129	Std. Error of Mean	51.87
Coefficient of Variation	2.278	Skewness	9.123
Normal GOF Test			
Shapiro Wilk Test Statistic	0.416	Shapiro Wilk GOF Test	
5% Shapiro Wilk P Value	0	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.334	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.0411	Data Not Normal at 5% Significance Level	
Data Not Normal at 5% Significance Level			
Assuming Normal Distribution			
95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	581.2	95% Adjusted-CLT UCL (Chen-1995)	604.2
		95% Modified-t UCL (Johnson-1978)	584.8
Gamma GOF Test			
A-D Test Statistic	21.64	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.805	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.165	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.0436	Data Not Gamma Distributed at 5% Significance Level	
Data Not Gamma Distributed at 5% Significance Level			
Gamma Statistics			
k hat (MLE)	0.67	k star (bias corrected MLE)	0.667
Theta hat (MLE)	740.2	Theta star (bias corrected MLE)	743.3
nu hat (MLE)	634.9	nu star (bias corrected)	632.2
MLE Mean (bias corrected)	495.7	MLE Sd (bias corrected)	607
		Approximate Chi Square Value (0.05)	574.9
Adjusted Level of Significance	0.0495	Adjusted Chi Square Value	574.7
Assuming Gamma Distribution			
95% Approximate Gamma UCL (use when n>=50))	545.1	95% Adjusted Gamma UCL (use when n<50)	545.3
Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.958	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk P Value	4.50E-13	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.0619	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.0411	Data Not Lognormal at 5% Significance Level	
Data Not Lognormal at 5% Significance Level			
Lognormal Statistics			
Minimum of Logged Data	2.485	Mean of logged Data	5.298
Maximum of Logged Data	9.798	SD of logged Data	1.243
Assuming Lognormal Distribution			
95% H-UCL	494	90% Chebyshev (MVUE) UCL	529.3
95% Chebyshev (MVUE) UCL	573.6	97.5% Chebyshev (MVUE) UCL	635
99% Chebyshev (MVUE) UCL	755.7		
Nonparametric Distribution Free UCL Statistics			
Data do not follow a Discernible Distribution (0.05)			
Nonparametric Distribution Free UCLs			
95% CLT UCL	581	95% Jackknife UCL	581.2
95% Standard Bootstrap UCL	579.8	95% Bootstrap-t UCL	621.1
95% Hall's Bootstrap UCL	672.4	95% Percentile Bootstrap UCL	584.2
95% BCA Bootstrap UCL	611.2		
90% Chebyshev(Mean, Sd) UCL	651.3	95% Chebyshev(Mean, Sd) UCL	721.8
97.5% Chebyshev(Mean, Sd) UCL	819.6	99% Chebyshev(Mean, Sd) UCL	1012

APPENDIX B-1A1
Metals in Soil - All Areas Except for Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - milligrams per kilogram (mg/kg)

Suggested UCL to Use	
95% Chebyshev (Mean, Sd) UCL	721.8

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

APPENDIX B-1A2
Metals in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - milligrams per kilogram (mg/kg)

Antimony

General Statistics			
Total Number of Observations	100	Number of Distinct Observations	59
Number of Detects	81	Number of Non-Detects	19
Number of Distinct Detects	52	Number of Distinct Non-Detects	8
Minimum Detect	0.22	Minimum Non-Detect	0.17
Maximum Detect	540	Maximum Non-Detect	5
Variance Detects	4136	Percent Non-Detects	19%
Mean Detects	13.16	SD Detects	64.31
Median Detects	1.8	CV Detects	4.889
Skewness Detects	7.425	Kurtosis Detects	58.76
Mean of Logged Detects	0.784	SD of Logged Detects	1.278

Normal GOF Test on Detects Only			
Shapiro Wilk Test Statistic	0.208	Normal GOF Test on Detected Observations Only	
5% Shapiro Wilk P Value	0	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.458	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.0985	Detected Data Not Normal at 5% Significance Level	
Detected Data Not Normal at 5% Significance Level			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
KM Mean	10.79	KM Standard Error of Mean	5.809
KM SD	57.73	95% KM (BCA) UCL	21.13
95% KM (t) UCL	20.43	95% KM (Percentile Bootstrap) UCL	21.28
95% KM (z) UCL	20.34	95% KM Bootstrap t UCL	64.38
90% KM Chebyshev UCL	28.21	95% KM Chebyshev UCL	36.11
97.5% KM Chebyshev UCL	47.06	99% KM Chebyshev UCL	68.59

Gamma GOF Tests on Detected Observations Only			
A-D Test Statistic	14.28	Anderson-Darling GOF Test	
5% A-D Critical Value	0.849	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.33	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.107	Detected Data Not Gamma Distributed at 5% Significance Level	
Detected Data Not Gamma Distributed at 5% Significance Level			

Gamma Statistics on Detected Data Only			
k hat (MLE)	0.371	k star (bias corrected MLE)	0.366
Theta hat (MLE)	35.42	Theta star (bias corrected MLE)	35.96
nu hat (MLE)	60.17	nu star (bias corrected)	59.27
Mean (detects)	13.16		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	10.79
Maximum	540	Median	1.5
SD	58.04	CV	5.379
k hat (MLE)	0.275	k star (bias corrected MLE)	0.273
Theta hat (MLE)	39.28	Theta star (bias corrected MLE)	39.51
nu hat (MLE)	54.93	nu star (bias corrected)	54.62
Adjusted Level of Significance (β)	0.0476		
Approximate Chi Square Value (54.62, α)	38.64	Adjusted Chi Square Value (54.62, β)	38.44
95% Gamma Approximate UCL (use when n>=50)	15.25	95% Gamma Adjusted UCL (use when n<50)	15.33

Estimates of Gamma Parameters using KM Estimates			
Mean (KM)	10.79	SD (KM)	57.73
Variance (KM)	3333	SE of Mean (KM)	5.809
k hat (KM)	0.0349	k star (KM)	0.0405
nu hat (KM)	6.98	nu star (KM)	8.104
theta hat (KM)	309	theta star (KM)	266.2
80% gamma percentile (KM)	0.628	90% gamma percentile (KM)	11.97
95% gamma percentile (KM)	52.12	99% gamma percentile (KM)	253.7

APPENDIX B-1A2
Metals in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - milligrams per kilogram (mg/kg)

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (8.10, α)	2.795	Adjusted Chi Square Value (8.10, β)	2.75
95% Gamma Approximate KM-UCL (use when n>=50)	31.27	95% Gamma Adjusted KM-UCL (use when n<50)	31.78

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Approximate Test Statistic	0.865	Shapiro Wilk GOF Test	
5% Shapiro Wilk P Value	4.50E-10	Detected Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.154	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.0985	Detected Data Not Lognormal at 5% Significance Level	

Detected Data Not Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	10.78	Mean in Log Scale	0.433
SD in Original Scale	58.02	SD in Log Scale	1.434
95% t UCL (assumes normality of ROS data)	20.42	95% Percentile Bootstrap UCL	22.29
95% BCA Bootstrap UCL	29.33	95% Bootstrap t UCL	67.2
95% H-UCL (Log ROS)	6.383		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	0.462	KM Geo Mean	1.587
KM SD (logged)	1.386	95% Critical H Value (KM-Log)	2.669
KM Standard Error of Mean (logged)	0.143	95% H-UCL (KM -Log)	6.014
KM SD (logged)	1.386	95% Critical H Value (KM-Log)	2.669
KM Standard Error of Mean (logged)	0.143		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	10.84	Mean in Log Scale	0.493
SD in Original Scale	58.01	SD in Log Scale	1.41
95% t UCL (Assumes normality)	20.47	95% H-Stat UCL	6.481

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Data do not follow a Discernible Distribution at 5% Significance Level

Suggested UCL to Use
95% KM (Chebyshev) UCL 36.11

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

APPENDIX B-1A2
Metals in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - milligrams per kilogram (mg/kg)

Arsenic

General Statistics			
Total Number of Observations	101	Number of Distinct Observations	74
Number of Detects	94	Number of Non-Detects	7
Number of Distinct Detects	70	Number of Distinct Non-Detects	5
Minimum Detect	0.35	Minimum Non-Detect	0.22
Maximum Detect	190	Maximum Non-Detect	5
Variance Detects	528.9	Percent Non-Detects	6.93%
Mean Detects	10.84	SD Detects	23
Median Detects	5.2	CV Detects	2.122
Skewness Detects	6.153	Kurtosis Detects	43.27
Mean of Logged Detects	1.736	SD of Logged Detects	0.998

Normal GOF Test on Detects Only			
Shapiro Wilk Test Statistic	0.384	Normal GOF Test on Detected Observations Only	
5% Shapiro Wilk P Value	0	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.327	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.0916	Detected Data Not Normal at 5% Significance Level	
Detected Data Not Normal at 5% Significance Level			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
KM Mean	10.18	KM Standard Error of Mean	2.221
KM SD	22.2	95% KM (BCA) UCL	14.47
95% KM (t) UCL	13.86	95% KM (Percentile Bootstrap) UCL	14.57
95% KM (z) UCL	13.83	95% KM Bootstrap t UCL	19.37
90% KM Chebyshev UCL	16.84	95% KM Chebyshev UCL	19.86
97.5% KM Chebyshev UCL	24.05	99% KM Chebyshev UCL	32.28

Gamma GOF Tests on Detected Observations Only			
A-D Test Statistic	5.446	Anderson-Darling GOF Test	
5% A-D Critical Value	0.787	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.191	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.0954	Detected Data Not Gamma Distributed at 5% Significance Level	
Detected Data Not Gamma Distributed at 5% Significance Level			

Gamma Statistics on Detected Data Only			
k hat (MLE)	0.903	k star (bias corrected MLE)	0.881
Theta hat (MLE)	12	Theta star (bias corrected MLE)	12.3
nu hat (MLE)	169.8	nu star (bias corrected)	165.7
Mean (detects)	10.84		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	10.09
Maximum	190	Median	4.9
SD	22.35	CV	2.216
k hat (MLE)	0.618	k star (bias corrected MLE)	0.606
Theta hat (MLE)	16.33	Theta star (bias corrected MLE)	16.64
nu hat (MLE)	124.8	nu star (bias corrected)	122.4
Adjusted Level of Significance (β)	0.0476		
Approximate Chi Square Value (122.42, α)	97.87	Adjusted Chi Square Value (122.42, β)	97.55
95% Gamma Approximate UCL (use when n>=50)	12.62	95% Gamma Adjusted UCL (use when n<50)	12.66

Estimates of Gamma Parameters using KM Estimates			
Mean (KM)	10.18	SD (KM)	22.2
Variance (KM)	493	SE of Mean (KM)	2.221
k hat (KM)	0.21	k star (KM)	0.21
nu hat (KM)	42.43	nu star (KM)	42.5
theta hat (KM)	48.45	theta star (KM)	48.36
80% gamma percentile (KM)	13.76	90% gamma percentile (KM)	30.77
95% gamma percentile (KM)	51.73	99% gamma percentile (KM)	109

APPENDIX B-1A2
Metals in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - milligrams per kilogram (mg/kg)

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (42.50, α)	28.56	Adjusted Chi Square Value (42.50, β)	28.39
95% Gamma Approximate KM-UCL (use when n>=50)	15.15	95% Gamma Adjusted KM-UCL (use when n<50)	15.23

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Approximate Test Statistic	0.965	Shapiro Wilk GOF Test	
5% Shapiro Wilk P Value	0.0719	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.1	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.0916	Detected Data Not Lognormal at 5% Significance Level	

Detected Data appear Approximate Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	10.18	Mean in Log Scale	1.617
SD in Original Scale	22.31	SD in Log Scale	1.075
95% t UCL (assumes normality of ROS data)	13.87	95% Percentile Bootstrap UCL	14.54
95% BCA Bootstrap UCL	15.71	95% Bootstrap t UCL	18.64
95% H-UCL (Log ROS)	11.47		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	1.578	KM Geo Mean	4.847
KM SD (logged)	1.167	95% Critical H Value (KM-Log)	2.363
KM Standard Error of Mean (logged)	0.118	95% H-UCL (KM -Log)	12.62
KM SD (logged)	1.167	95% Critical H Value (KM-Log)	2.363
KM Standard Error of Mean (logged)	0.118		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	10.17	Mean in Log Scale	1.565
SD in Original Scale	22.32	SD in Log Scale	1.209
95% t UCL (Assumes normality)	13.85	95% H-Stat UCL	13.3

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Detected Data appear Approximate Lognormal Distributed at 5% Significance Level

Suggested UCL to Use

KM H-UCL	12.62

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

APPENDIX B-1A2
Metals in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - milligrams per kilogram (mg/kg)

Barium

General Statistics

Total Number of Observations	101	Number of Distinct Observations	65
		Number of Missing Observations	0
Minimum	7.8	Mean	74.61
Maximum	760	Median	51
SD	91.74	Std. Error of Mean	9.129
Coefficient of Variation	1.23	Skewness	4.899

Normal GOF Test

Shapiro Wilk Test Statistic	0.559	Shapiro Wilk GOF Test	
5% Shapiro Wilk P Value	0	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.264	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.0884	Data Not Normal at 5% Significance Level	
Data Not Normal at 5% Significance Level			

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	89.77	95% Adjusted-CLT UCL (Chen-1995)	94.38
		95% Modified-t UCL (Johnson-1978)	90.51

Gamma GOF Test

A-D Test Statistic	2.795	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.769	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.134	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.0908	Data Not Gamma Distributed at 5% Significance Level	
Data Not Gamma Distributed at 5% Significance Level			

Gamma Statistics

k hat (MLE)	1.564	k star (bias corrected MLE)	1.524
Theta hat (MLE)	47.7	Theta star (bias corrected MLE)	48.95
nu hat (MLE)	316	nu star (bias corrected)	307.9
MLE Mean (bias corrected)	74.61	MLE Sd (bias corrected)	60.43
		Approximate Chi Square Value (0.05)	268.3
Adjusted Level of Significance	0.0476	Adjusted Chi Square Value	267.7

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	85.64	95% Adjusted Gamma UCL (use when n<50)	85.81

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.978	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk P Value	0.419	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.0775	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.0884	Data appear Lognormal at 5% Significance Level	
Data appear Lognormal at 5% Significance Level			

Lognormal Statistics

Minimum of Logged Data	2.054	Mean of logged Data	3.96
Maximum of Logged Data	6.633	SD of logged Data	0.787

Assuming Lognormal Distribution

95% H-UCL	83.86	90% Chebyshev (MVUE) UCL	90.13
95% Chebyshev (MVUE) UCL	98.7	97.5% Chebyshev (MVUE) UCL	110.6
99% Chebyshev (MVUE) UCL	134		

Nonparametric Distribution Free UCL Statistics
Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	89.63	95% Jackknife UCL	89.77
95% Standard Bootstrap UCL	89.26	95% Bootstrap-t UCL	97.61
95% Hall's Bootstrap UCL	121	95% Percentile Bootstrap UCL	91.73
95% BCA Bootstrap UCL	94.38		
90% Chebyshev(Mean, Sd) UCL	102	95% Chebyshev(Mean, Sd) UCL	114.4
97.5% Chebyshev(Mean, Sd) UCL	131.6	99% Chebyshev(Mean, Sd) UCL	165.4

APPENDIX B-1A2
Metals in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - milligrams per kilogram (mg/kg)

Suggested UCL to Use	
95% H-UCL	83.86

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

ProUCL computes and outputs H-statistic based UCLs for historical reasons only.
H-statistic often results in unstable (both high and low) values of UCL95 as shown in examples in the Technical Guide.
It is therefore recommended to avoid the use of H-statistic based 95% UCLs.
Use of nonparametric methods are preferred to compute UCL95 for skewed data sets which do not follow a gamma distribution.

APPENDIX B-1A2
Metals in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - milligrams per kilogram (mg/kg)

Beryllium

General Statistics

Total Number of Observations	101	Number of Distinct Observations	46
Number of Detects	44	Number of Non-Detects	57
Number of Distinct Detects	30	Number of Distinct Non-Detects	22
Minimum Detect	0.089	Minimum Non-Detect	0.068
Maximum Detect	0.83	Maximum Non-Detect	0.46
Variance Detects	0.0311	Percent Non-Detects	56.44%
Mean Detects	0.287	SD Detects	0.176
Median Detects	0.23	CV Detects	0.614
Skewness Detects	1.337	Kurtosis Detects	1.715
Mean of Logged Detects	-1.416	SD of Logged Detects	0.586

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.87	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.944	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.15	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.132	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.167	KM Standard Error of Mean	0.0159
KM SD	0.157	95% KM (BCA) UCL	0.198
95% KM (t) UCL	0.194	95% KM (Percentile Bootstrap) UCL	0.195
95% KM (z) UCL	0.194	95% KM Bootstrap t UCL	0.197
90% KM Chebyshev UCL	0.215	95% KM Chebyshev UCL	0.237
97.5% KM Chebyshev UCL	0.267	99% KM Chebyshev UCL	0.326

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.47	Anderson-Darling GOF Test	
5% A-D Critical Value	0.755	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.0966	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.134	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	3.13	k star (bias corrected MLE)	2.931
Theta hat (MLE)	0.0918	Theta star (bias corrected MLE)	0.098
nu hat (MLE)	275.4	nu star (bias corrected)	258
Mean (detects)	0.287		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.136
Maximum	0.83	Median	0.048
SD	0.177	CV	1.303
k hat (MLE)	0.597	k star (bias corrected MLE)	0.586
Theta hat (MLE)	0.228	Theta star (bias corrected MLE)	0.232
nu hat (MLE)	120.6	nu star (bias corrected)	118.4
Adjusted Level of Significance (β)	0.0476		
Approximate Chi Square Value (118.38, α)	94.26	Adjusted Chi Square Value (118.38, β)	93.95
95% Gamma Approximate UCL (use when n>=50)	0.171	95% Gamma Adjusted UCL (use when n<50)	0.172

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.167	SD (KM)	0.157
Variance (KM)	0.0247	SE of Mean (KM)	0.0159
k hat (KM)	1.136	k star (KM)	1.109
nu hat (KM)	229.5	nu star (KM)	224
theta hat (KM)	0.147	theta star (KM)	0.151
80% gamma percentile (KM)	0.267	90% gamma percentile (KM)	0.376
95% gamma percentile (KM)	0.484	99% gamma percentile (KM)	0.732

APPENDIX B-1A2
Metals in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - milligrams per kilogram (mg/kg)

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (224.00, α)	190.4	Adjusted Chi Square Value (224.00, β)	189.9
95% Gamma Approximate KM-UCL (use when n>=50)	0.197	95% Gamma Adjusted KM-UCL (use when n<50)	0.197

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.962	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.944	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.0763	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.132	Detected Data appear Lognormal at 5% Significance Level	
Detected Data appear Lognormal at 5% Significance Level			

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.16	Mean in Log Scale	-2.245
SD in Original Scale	0.163	SD in Log Scale	0.888
95% t UCL (assumes normality of ROS data)	0.186	95% Percentile Bootstrap UCL	0.186
95% BCA Bootstrap UCL	0.188	95% Bootstrap t UCL	0.192
95% H-UCL (Log ROS)	0.189		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-2.095	KM Geo Mean	0.123
KM SD (logged)	0.725	95% Critical H Value (KM-Log)	1.978
KM Standard Error of Mean (logged)	0.075	95% H-UCL (KM -Log)	0.185
KM SD (logged)	0.725	95% Critical H Value (KM-Log)	1.978
KM Standard Error of Mean (logged)	0.075		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.16	Mean in Log Scale	-2.238
SD in Original Scale	0.163	SD in Log Scale	0.865
95% t UCL (Assumes normality)	0.187	95% H-Stat UCL	0.186

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Detected Data appear Gamma Distributed at 5% Significance Level

Suggested UCL to Use

95% KM Approximate Gamma UCL	0.197	95% GROS Approximate Gamma UCL	0.171

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

APPENDIX B-1A2
Metals in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - milligrams per kilogram (mg/kg)

Cadmium

General Statistics

Total Number of Observations	101	Number of Distinct Observations	65
Number of Detects	93	Number of Non-Detects	8
Number of Distinct Detects	60	Number of Distinct Non-Detects	6
Minimum Detect	0.073	Minimum Non-Detect	0.03
Maximum Detect	4.4	Maximum Non-Detect	0.25
Variance Detects	0.539	Percent Non-Detects	7.92%
Mean Detects	0.627	SD Detects	0.734
Median Detects	0.37	CV Detects	1.171
Skewness Detects	2.619	Kurtosis Detects	8.124
Mean of Logged Detects	-0.927	SD of Logged Detects	0.925

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.685	Normal GOF Test on Detected Observations Only	
5% Shapiro Wilk P Value	0	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.24	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.0921	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.583	KM Standard Error of Mean	0.0717
KM SD	0.717	95% KM (BCA) UCL	0.72
95% KM (t) UCL	0.702	95% KM (Percentile Bootstrap) UCL	0.7
95% KM (z) UCL	0.701	95% KM Bootstrap t UCL	0.74
90% KM Chebyshev UCL	0.798	95% KM Chebyshev UCL	0.895
97.5% KM Chebyshev UCL	1.031	99% KM Chebyshev UCL	1.296

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	2.633	Anderson-Darling GOF Test	
5% A-D Critical Value	0.778	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.126	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.0951	Detected Data Not Gamma Distributed at 5% Significance Level	

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	1.225	k star (bias corrected MLE)	1.193
Theta hat (MLE)	0.512	Theta star (bias corrected MLE)	0.526
nu hat (MLE)	227.8	nu star (bias corrected)	221.8
Mean (detects)	0.627		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.579
Maximum	4.4	Median	0.34
SD	0.723	CV	1.25
k hat (MLE)	0.895	k star (bias corrected MLE)	0.875
Theta hat (MLE)	0.647	Theta star (bias corrected MLE)	0.662
nu hat (MLE)	180.7	nu star (bias corrected)	176.7
Adjusted Level of Significance (β)	0.0476		
Approximate Chi Square Value (176.66, α)	146.9	Adjusted Chi Square Value (176.66, β)	146.5
95% Gamma Approximate UCL (use when n>=50)	0.696	95% Gamma Adjusted UCL (use when n<50)	0.698

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.583	SD (KM)	0.717
Variance (KM)	0.514	SE of Mean (KM)	0.0717
k hat (KM)	0.66	k star (KM)	0.647
nu hat (KM)	133.3	nu star (KM)	130.7
theta hat (KM)	0.883	theta star (KM)	0.9
80% gamma percentile (KM)	0.96	90% gamma percentile (KM)	1.489
95% gamma percentile (KM)	2.04	99% gamma percentile (KM)	3.363

APPENDIX B-1A2
Metals in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - milligrams per kilogram (mg/kg)

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (130.68, α)	105.3	Adjusted Chi Square Value (130.68, β)	104.9
95% Gamma Approximate KM-UCL (use when n>=50)	0.723	95% Gamma Adjusted KM-UCL (use when n<50)	0.725

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Approximate Test Statistic	0.962	Shapiro Wilk GOF Test	
5% Shapiro Wilk P Value	0.0429	Detected Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.0652	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.0921	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Approximate Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.583	Mean in Log Scale	-1.073
SD in Original Scale	0.72	SD in Log Scale	1.029
95% t UCL (assumes normality of ROS data)	0.702	95% Percentile Bootstrap UCL	0.706
95% BCA Bootstrap UCL	0.727	95% Bootstrap t UCL	0.732
95% H-UCL (Log ROS)	0.73		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-1.094	KM Geo Mean	0.335
KM SD (logged)	1.069	95% Critical H Value (KM-Log)	2.268
KM Standard Error of Mean (logged)	0.108	95% H-UCL (KM -Log)	0.755
KM SD (logged)	1.069	95% Critical H Value (KM-Log)	2.268
KM Standard Error of Mean (logged)	0.108		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.582	Mean in Log Scale	-1.111
SD in Original Scale	0.721	SD in Log Scale	1.11
95% t UCL (Assumes normality)	0.701	95% H-Stat UCL	0.788

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Detected Data appear Approximate Lognormal Distributed at 5% Significance Level

Suggested UCL to Use

KM H-UCL	0.755

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

APPENDIX B-1A2
Metals in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - milligrams per kilogram (mg/kg)

Chromium

General Statistics

Total Number of Observations	101	Number of Distinct Observations	50
		Number of Missing Observations	0
Minimum	4	Mean	30.78
Maximum	410	Median	23
SD	41.67	Std. Error of Mean	4.146
Coefficient of Variation	1.354	Skewness	7.742

Normal GOF Test

Shapiro Wilk Test Statistic	0.411	Shapiro Wilk GOF Test	
5% Shapiro Wilk P Value	0	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.263	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.0884	Data Not Normal at 5% Significance Level	
Data Not Normal at 5% Significance Level			

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	37.66	95% Adjusted-CLT UCL (Chen-1995)	41.01
		95% Modified-t UCL (Johnson-1978)	38.2

Gamma GOF Test

A-D Test Statistic	2.265	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.766	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.134	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.0905	Data Not Gamma Distributed at 5% Significance Level	
Data Not Gamma Distributed at 5% Significance Level			

Gamma Statistics

k hat (MLE)	1.915	k star (bias corrected MLE)	1.864
Theta hat (MLE)	16.08	Theta star (bias corrected MLE)	16.51
nu hat (MLE)	386.8	nu star (bias corrected)	376.6
MLE Mean (bias corrected)	30.78	MLE Sd (bias corrected)	22.54
		Approximate Chi Square Value (0.05)	332.6
Adjusted Level of Significance	0.0476	Adjusted Chi Square Value	332

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	34.85	95% Adjusted Gamma UCL (use when n<50)	34.91

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.981	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk P Value	0.563	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.0697	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.0884	Data appear Lognormal at 5% Significance Level	
Data appear Lognormal at 5% Significance Level			

Lognormal Statistics

Minimum of Logged Data	1.386	Mean of logged Data	3.144
Maximum of Logged Data	6.016	SD of logged Data	0.677

Assuming Lognormal Distribution

95% H-UCL	33.25	90% Chebyshev (MVUE) UCL	35.52
95% Chebyshev (MVUE) UCL	38.44	97.5% Chebyshev (MVUE) UCL	42.5
99% Chebyshev (MVUE) UCL	50.47		

Nonparametric Distribution Free UCL Statistics
Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	37.6	95% Jackknife UCL	37.66
95% Standard Bootstrap UCL	37.67	95% Bootstrap-t UCL	46.24
95% Hall's Bootstrap UCL	65.21	95% Percentile Bootstrap UCL	38.27
95% BCA Bootstrap UCL	43.43		
90% Chebyshev(Mean, Sd) UCL	43.22	95% Chebyshev(Mean, Sd) UCL	48.85
97.5% Chebyshev(Mean, Sd) UCL	56.67	99% Chebyshev(Mean, Sd) UCL	72.03

APPENDIX B-1A2
Metals in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - milligrams per kilogram (mg/kg)

Suggested UCL to Use	
95% H-UCL	33.25

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

ProUCL computes and outputs H-statistic based UCLs for historical reasons only.
H-statistic often results in unstable (both high and low) values of UCL95 as shown in examples in the Technical Guide.
It is therefore recommended to avoid the use of H-statistic based 95% UCLs.
Use of nonparametric methods are preferred to compute UCL95 for skewed data sets which do not follow a gamma distribution.

APPENDIX B-1A2
Metals in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - milligrams per kilogram (mg/kg)

Cobalt

General Statistics			
Total Number of Observations	101	Number of Distinct Observations	55
		Number of Missing Observations	0
Minimum	0.6	Mean	8.738
Maximum	35	Median	8
SD	4.432	Std. Error of Mean	0.441
Coefficient of Variation	0.507	Skewness	2.203
Normal GOF Test			
Shapiro Wilk Test Statistic	0.882	Shapiro Wilk GOF Test	
5% Shapiro Wilk P Value	3.67E-11	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.107	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.0884	Data Not Normal at 5% Significance Level	
Data Not Normal at 5% Significance Level			
Assuming Normal Distribution			
95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	9.47	95% Adjusted-CLT UCL (Chen-1995)	9.566
		95% Modified-t UCL (Johnson-1978)	9.486
Gamma GOF Test			
A-D Test Statistic	0.614	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.756	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.0624	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.0895	Detected data appear Gamma Distributed at 5% Significance Level	
Detected data appear Gamma Distributed at 5% Significance Level			
Gamma Statistics			
k hat (MLE)	4.148	k star (bias corrected MLE)	4.032
Theta hat (MLE)	2.106	Theta star (bias corrected MLE)	2.167
nu hat (MLE)	838	nu star (bias corrected)	814.4
MLE Mean (bias corrected)	8.738	MLE Sd (bias corrected)	4.352
		Approximate Chi Square Value (0.05)	749.2
Adjusted Level of Significance	0.0476	Adjusted Chi Square Value	748.3
Assuming Gamma Distribution			
95% Approximate Gamma UCL (use when n>=50)	9.498	95% Adjusted Gamma UCL (use when n<50)	9.51
Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.943	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk P Value	5.26E-04	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.0907	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.0884	Data Not Lognormal at 5% Significance Level	
Data Not Lognormal at 5% Significance Level			
Lognormal Statistics			
Minimum of Logged Data	-0.511	Mean of logged Data	2.042
Maximum of Logged Data	3.555	SD of logged Data	0.542
Assuming Lognormal Distribution			
95% H-UCL	9.871	90% Chebyshev (MVUE) UCL	10.45
95% Chebyshev (MVUE) UCL	11.14	97.5% Chebyshev (MVUE) UCL	12.11
99% Chebyshev (MVUE) UCL	14		
Nonparametric Distribution Free UCL Statistics			
Data appear to follow a Discernible Distribution at 5% Significance Level			
Nonparametric Distribution Free UCLs			
95% CLT UCL	9.463	95% Jackknife UCL	9.47
95% Standard Bootstrap UCL	9.455	95% Bootstrap-t UCL	9.554
95% Hall's Bootstrap UCL	9.68	95% Percentile Bootstrap UCL	9.473
95% BCA Bootstrap UCL	9.629		
90% Chebyshev(Mean, Sd) UCL	10.06	95% Chebyshev(Mean, Sd) UCL	10.66
97.5% Chebyshev(Mean, Sd) UCL	11.49	99% Chebyshev(Mean, Sd) UCL	13.13

APPENDIX B-1A2
Metals in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - milligrams per kilogram (mg/kg)

Suggested UCL to Use	
95% Approximate Gamma UCL	9.498

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

APPENDIX B-1A2
Metals in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - milligrams per kilogram (mg/kg)

Copper

General Statistics			
Total Number of Observations	101	Number of Distinct Observations	59
		Number of Missing Observations	0
Minimum	9.3	Mean	144.3
Maximum	3000	Median	89
SD	311.2	Std. Error of Mean	30.96
Coefficient of Variation	2.156	Skewness	8.013
Normal GOF Test			
Shapiro Wilk Test Statistic	0.342	Shapiro Wilk GOF Test	
5% Shapiro Wilk P Value	0	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.332	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.0884	Data Not Normal at 5% Significance Level	
Data Not Normal at 5% Significance Level			
Assuming Normal Distribution			
95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	195.7	95% Adjusted-CLT UCL (Chen-1995)	221.6
		95% Modified-t UCL (Johnson-1978)	199.8
Gamma GOF Test			
A-D Test Statistic	3.143	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.784	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.151	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.0919	Data Not Gamma Distributed at 5% Significance Level	
Data Not Gamma Distributed at 5% Significance Level			
Gamma Statistics			
k hat (MLE)	0.989	k star (bias corrected MLE)	0.966
Theta hat (MLE)	146	Theta star (bias corrected MLE)	149.4
nu hat (MLE)	199.7	nu star (bias corrected)	195.1
MLE Mean (bias corrected)	144.3	MLE Sd (bias corrected)	146.9
		Approximate Chi Square Value (0.05)	163.8
Adjusted Level of Significance	0.0476	Adjusted Chi Square Value	163.4
Assuming Gamma Distribution			
95% Approximate Gamma UCL (use when n>=50))	171.9	95% Adjusted Gamma UCL (use when n<50)	172.3
Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.974	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk P Value	0.26	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.0778	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.0884	Data appear Lognormal at 5% Significance Level	
Data appear Lognormal at 5% Significance Level			
Lognormal Statistics			
Minimum of Logged Data	2.23	Mean of logged Data	4.387
Maximum of Logged Data	8.006	SD of logged Data	0.988
Assuming Lognormal Distribution			
95% H-UCL	162.8	90% Chebyshev (MVUE) UCL	176
95% Chebyshev (MVUE) UCL	196.8	97.5% Chebyshev (MVUE) UCL	225.7
99% Chebyshev (MVUE) UCL	282.4		
Nonparametric Distribution Free UCL Statistics			
Data appear to follow a Discernible Distribution at 5% Significance Level			
Nonparametric Distribution Free UCLs			
95% CLT UCL	195.2	95% Jackknife UCL	195.7
95% Standard Bootstrap UCL	194.9	95% Bootstrap-t UCL	274.4
95% Hall's Bootstrap UCL	385.3	95% Percentile Bootstrap UCL	202.5
95% BCA Bootstrap UCL	238		
90% Chebyshev(Mean, Sd) UCL	237.2	95% Chebyshev(Mean, Sd) UCL	279.3
97.5% Chebyshev(Mean, Sd) UCL	337.7	99% Chebyshev(Mean, Sd) UCL	452.4

APPENDIX B-1A2
Metals in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - milligrams per kilogram (mg/kg)

Suggested UCL to Use	
95% H-UCL	162.8

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

ProUCL computes and outputs H-statistic based UCLs for historical reasons only.
H-statistic often results in unstable (both high and low) values of UCL95 as shown in examples in the Technical Guide.
It is therefore recommended to avoid the use of H-statistic based 95% UCLs.
Use of nonparametric methods are preferred to compute UCL95 for skewed data sets which do not follow a gamma distribution.

APPENDIX B-1A2
Metals in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - milligrams per kilogram (mg/kg)

Lead

General Statistics			
Total Number of Observations	101	Number of Distinct Observations	72
		Number of Missing Observations	0
Minimum	1.9	Mean	324.9
Maximum	7400	Median	130
SD	928.4	Std. Error of Mean	92.38
Coefficient of Variation	2.857	Skewness	6.147
Normal GOF Test			
Shapiro Wilk Test Statistic	0.336	Shapiro Wilk GOF Test	
5% Shapiro Wilk P Value	0	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.364	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.0884	Data Not Normal at 5% Significance Level	
Data Not Normal at 5% Significance Level			
Assuming Normal Distribution			
95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	478.3	95% Adjusted-CLT UCL (Chen-1995)	537.2
		95% Modified-t UCL (Johnson-1978)	487.7
Gamma GOF Test			
A-D Test Statistic	3.689	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.82	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.181	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.0944	Data Not Gamma Distributed at 5% Significance Level	
Data Not Gamma Distributed at 5% Significance Level			
Gamma Statistics			
k hat (MLE)	0.493	k star (bias corrected MLE)	0.485
Theta hat (MLE)	658.8	Theta star (bias corrected MLE)	669.8
nu hat (MLE)	99.62	nu star (bias corrected)	97.99
MLE Mean (bias corrected)	324.9	MLE Sd (bias corrected)	466.5
		Approximate Chi Square Value (0.05)	76.16
Adjusted Level of Significance	0.0476	Adjusted Chi Square Value	75.88
Assuming Gamma Distribution			
95% Approximate Gamma UCL (use when n>=50))	418.1	95% Adjusted Gamma UCL (use when n<50)	419.6
Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.968	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk P Value	0.1	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.116	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.0884	Data Not Lognormal at 5% Significance Level	
Data appear Approximate Lognormal at 5% Significance Level			
Lognormal Statistics			
Minimum of Logged Data	0.642	Mean of logged Data	4.493
Maximum of Logged Data	8.909	SD of logged Data	1.633
Assuming Lognormal Distribution			
95% H-UCL	541.4	90% Chebyshev (MVUE) UCL	560.2
95% Chebyshev (MVUE) UCL	664.9	97.5% Chebyshev (MVUE) UCL	810.1
99% Chebyshev (MVUE) UCL	1095		
Nonparametric Distribution Free UCL Statistics			
Data appear to follow a Discernible Distribution at 5% Significance Level			
Nonparametric Distribution Free UCLs			
95% CLT UCL	476.9	95% Jackknife UCL	478.3
95% Standard Bootstrap UCL	474	95% Bootstrap-t UCL	752.5
95% Hall's Bootstrap UCL	1073	95% Percentile Bootstrap UCL	486.8
95% BCA Bootstrap UCL	552.4		
90% Chebyshev(Mean, Sd) UCL	602	95% Chebyshev(Mean, Sd) UCL	727.6
97.5% Chebyshev(Mean, Sd) UCL	901.8	99% Chebyshev(Mean, Sd) UCL	1244

APPENDIX B-1A2
Metals in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - milligrams per kilogram (mg/kg)

Suggested UCL to Use	
95% H-UCL	541.4

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

ProUCL computes and outputs H-statistic based UCLs for historical reasons only.
H-statistic often results in unstable (both high and low) values of UCL95 as shown in examples in the Technical Guide.
It is therefore recommended to avoid the use of H-statistic based 95% UCLs.
Use of nonparametric methods are preferred to compute UCL95 for skewed data sets which do not follow a gamma distribution.

APPENDIX B-1A2
Metals in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - milligrams per kilogram (mg/kg)

Mercury

General Statistics

Total Number of Observations	101	Number of Distinct Observations	64
Number of Detects	95	Number of Non-Detects	6
Number of Distinct Detects	63	Number of Distinct Non-Detects	2
Minimum Detect	0.0064	Minimum Non-Detect	0.012
Maximum Detect	6.9	Maximum Non-Detect	0.1
Variance Detects	0.542	Percent Non-Detects	5.94%
Mean Detects	0.232	SD Detects	0.736
Median Detects	0.081	CV Detects	3.178
Skewness Detects	8.225	Kurtosis Detects	73.61
Mean of Logged Detects	-2.317	SD of Logged Detects	1.031

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.266	Normal GOF Test on Detected Observations Only	
5% Shapiro Wilk P Value	0	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.38	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.0911	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.221	KM Standard Error of Mean	0.0712
KM SD	0.711	95% KM (BCA) UCL	0.34
95% KM (t) UCL	0.339	95% KM (Percentile Bootstrap) UCL	0.349
95% KM (z) UCL	0.338	95% KM Bootstrap t UCL	0.605
90% KM Chebyshev UCL	0.434	95% KM Chebyshev UCL	0.531
97.5% KM Chebyshev UCL	0.665	99% KM Chebyshev UCL	0.929

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	8.41	Anderson-Darling GOF Test	
5% A-D Critical Value	0.799	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.24	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.0957	Detected Data Not Gamma Distributed at 5% Significance Level	

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.706	k star (bias corrected MLE)	0.691
Theta hat (MLE)	0.328	Theta star (bias corrected MLE)	0.335
nu hat (MLE)	134.2	nu star (bias corrected)	131.3
Mean (detects)	0.232		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.0064	Mean	0.219
Maximum	6.9	Median	0.076
SD	0.715	CV	3.269
k hat (MLE)	0.664	k star (bias corrected MLE)	0.65
Theta hat (MLE)	0.33	Theta star (bias corrected MLE)	0.336
nu hat (MLE)	134	nu star (bias corrected)	131.4
Adjusted Level of Significance (β)	0.0476		
Approximate Chi Square Value (131.40, α)	105.9	Adjusted Chi Square Value (131.40, β)	105.6
95% Gamma Approximate UCL (use when n>=50)	0.271	95% Gamma Adjusted UCL (use when n<50)	0.272

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.221	SD (KM)	0.711
Variance (KM)	0.506	SE of Mean (KM)	0.0712
k hat (KM)	0.0962	k star (KM)	0.1
nu hat (KM)	19.44	nu star (KM)	20.19
theta hat (KM)	2.293	theta star (KM)	2.207
80% gamma percentile (KM)	0.153	90% gamma percentile (KM)	0.587
95% gamma percentile (KM)	1.281	99% gamma percentile (KM)	3.506

APPENDIX B-1A2
Metals in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - milligrams per kilogram (mg/kg)

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (20.19, α)	10.99	Adjusted Chi Square Value (20.19, β)	10.9
95% Gamma Approximate KM-UCL (use when n>=50)	0.405	95% Gamma Adjusted KM-UCL (use when n<50)	0.409

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Approximate Test Statistic	0.942	Shapiro Wilk GOF Test	
5% Shapiro Wilk P Value	6.49E-04	Detected Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.142	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.0911	Detected Data Not Lognormal at 5% Significance Level	

Detected Data Not Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.221	Mean in Log Scale	-2.373
SD in Original Scale	0.715	SD in Log Scale	1.042
95% t UCL (assumes normality of ROS data)	0.339	95% Percentile Bootstrap UCL	0.359
95% BCA Bootstrap UCL	0.446	95% Bootstrap t UCL	0.592
95% H-UCL (Log ROS)	0.203		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-2.378	KM Geo Mean	0.0928
KM SD (logged)	1.048	95% Critical H Value (KM-Log)	2.249
KM Standard Error of Mean (logged)	0.106	95% H-UCL (KM -Log)	0.203
KM SD (logged)	1.048	95% Critical H Value (KM-Log)	2.249
KM Standard Error of Mean (logged)	0.106		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.22	Mean in Log Scale	-2.379
SD in Original Scale	0.715	SD in Log Scale	1.047
95% t UCL (Assumes normality)	0.338	95% H-Stat UCL	0.203

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Data do not follow a Discernible Distribution at 5% Significance Level

Suggested UCL to Use

95% KM (Chebyshev) UCL	0.531

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

APPENDIX B-1A2
Metals in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - milligrams per kilogram (mg/kg)

Molybdenum

General Statistics

Total Number of Observations	101	Number of Distinct Observations	49
Number of Detects	63	Number of Non-Detects	38
Number of Distinct Detects	46	Number of Distinct Non-Detects	11
Minimum Detect	0.15	Minimum Non-Detect	0.15
Maximum Detect	6.2	Maximum Non-Detect	1
Variance Detects	2.077	Percent Non-Detects	37.62%
Mean Detects	1.287	SD Detects	1.441
Median Detects	0.79	CV Detects	1.12
Skewness Detects	1.957	Kurtosis Detects	3.355
Mean of Logged Detects	-0.247	SD of Logged Detects	0.993

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.728	Normal GOF Test on Detected Observations Only	
5% Shapiro Wilk P Value	2.55E-15	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.254	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.111	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.882	KM Standard Error of Mean	0.125
KM SD	1.247	95% KM (BCA) UCL	1.098
95% KM (t) UCL	1.09	95% KM (Percentile Bootstrap) UCL	1.095
95% KM (z) UCL	1.088	95% KM Bootstrap t UCL	1.149
90% KM Chebyshev UCL	1.258	95% KM Chebyshev UCL	1.429
97.5% KM Chebyshev UCL	1.665	99% KM Chebyshev UCL	2.13

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	1.662	Anderson-Darling GOF Test	
5% A-D Critical Value	0.777	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.134	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.115	Detected Data Not Gamma Distributed at 5% Significance Level	

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	1.138	k star (bias corrected MLE)	1.094
Theta hat (MLE)	1.131	Theta star (bias corrected MLE)	1.177
nu hat (MLE)	143.4	nu star (bias corrected)	137.9
Mean (detects)	1.287		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.83
Maximum	6.2	Median	0.36
SD	1.285	CV	1.548
k hat (MLE)	0.427	k star (bias corrected MLE)	0.421
Theta hat (MLE)	1.945	Theta star (bias corrected MLE)	1.973
nu hat (MLE)	86.23	nu star (bias corrected)	85
Adjusted Level of Significance (β)	0.0476		
Approximate Chi Square Value (85.00, α)	64.75	Adjusted Chi Square Value (85.00, β)	64.49
95% Gamma Approximate UCL (use when n>=50)	1.09	95% Gamma Adjusted UCL (use when n<50)	1.094

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.882	SD (KM)	1.247
Variance (KM)	1.556	SE of Mean (KM)	0.125
k hat (KM)	0.5	k star (KM)	0.492
nu hat (KM)	101	nu star (KM)	99.31
theta hat (KM)	1.764	theta star (KM)	1.794
80% gamma percentile (KM)	1.447	90% gamma percentile (KM)	2.394
95% gamma percentile (KM)	3.408	99% gamma percentile (KM)	5.906

APPENDIX B-1A2
Metals in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - milligrams per kilogram (mg/kg)

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (99.31, α)	77.32	Adjusted Chi Square Value (99.31, β)	77.04
95% Gamma Approximate KM-UCL (use when n>=50)	1.133	95% Gamma Adjusted KM-UCL (use when n<50)	1.137

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Approximate Test Statistic	0.947	Shapiro Wilk GOF Test	
5% Shapiro Wilk P Value	0.0179	Detected Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.0997	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.111	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Approximate Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.862	Mean in Log Scale	-0.965
SD in Original Scale	1.265	SD in Log Scale	1.293
95% t UCL (assumes normality of ROS data)	1.071	95% Percentile Bootstrap UCL	1.076
95% BCA Bootstrap UCL	1.113	95% Bootstrap t UCL	1.12
95% H-UCL (Log ROS)	1.213		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-0.789	KM Geo Mean	0.454
KM SD (logged)	1.077	95% Critical H Value (KM-Log)	2.276
KM Standard Error of Mean (logged)	0.111	95% H-UCL (KM -Log)	1.036
KM SD (logged)	1.077	95% Critical H Value (KM-Log)	2.276
KM Standard Error of Mean (logged)	0.111		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.886	Mean in Log Scale	-0.83
SD in Original Scale	1.253	SD in Log Scale	1.173
95% t UCL (Assumes normality)	1.093	95% H-Stat UCL	1.145

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Detected Data appear Approximate Lognormal Distributed at 5% Significance Level

Suggested UCL to Use

KM H-UCL	1.036

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

APPENDIX B-1A2
Metals in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - milligrams per kilogram (mg/kg)

Nickel

General Statistics			
Total Number of Observations	101	Number of Distinct Observations	56
		Number of Missing Observations	0
Minimum	2	Mean	32.98
Maximum	170	Median	24
SD	33.25	Std. Error of Mean	3.308
Coefficient of Variation	1.008	Skewness	2.344
Normal GOF Test			
Shapiro Wilk Test Statistic	0.719	Shapiro Wilk GOF Test	
5% Shapiro Wilk P Value	0	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.23	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.0884	Data Not Normal at 5% Significance Level	
Data Not Normal at 5% Significance Level			
Assuming Normal Distribution			
95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	38.47	95% Adjusted-CLT UCL (Chen-1995)	39.25
		95% Modified-t UCL (Johnson-1978)	38.6
Gamma GOF Test			
A-D Test Statistic	1.654	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.771	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.119	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.0909	Data Not Gamma Distributed at 5% Significance Level	
Data Not Gamma Distributed at 5% Significance Level			
Gamma Statistics			
k hat (MLE)	1.47	k star (bias corrected MLE)	1.433
Theta hat (MLE)	22.43	Theta star (bias corrected MLE)	23.02
nu hat (MLE)	297	nu star (bias corrected)	289.5
MLE Mean (bias corrected)	32.98	MLE Sd (bias corrected)	27.55
		Approximate Chi Square Value (0.05)	251.1
Adjusted Level of Significance	0.0476	Adjusted Chi Square Value	250.5
Assuming Gamma Distribution			
95% Approximate Gamma UCL (use when n>=50))	38.03	95% Adjusted Gamma UCL (use when n<50)	38.1
Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.98	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk P Value	0.503	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.0743	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.0884	Data appear Lognormal at 5% Significance Level	
Data appear Lognormal at 5% Significance Level			
Lognormal Statistics			
Minimum of Logged Data	0.693	Mean of logged Data	3.119
Maximum of Logged Data	5.136	SD of logged Data	0.873
Assuming Lognormal Distribution			
95% H-UCL	39.76	90% Chebyshev (MVUE) UCL	42.88
95% Chebyshev (MVUE) UCL	47.38	97.5% Chebyshev (MVUE) UCL	53.62
99% Chebyshev (MVUE) UCL	65.89		
Nonparametric Distribution Free UCL Statistics			
Data appear to follow a Discernible Distribution at 5% Significance Level			
Nonparametric Distribution Free UCLs			
95% CLT UCL	38.42	95% Jackknife UCL	38.47
95% Standard Bootstrap UCL	38.5	95% Bootstrap-t UCL	39.44
95% Hall's Bootstrap UCL	39.47	95% Percentile Bootstrap UCL	38.5
95% BCA Bootstrap UCL	39.28		
90% Chebyshev(Mean, Sd) UCL	42.91	95% Chebyshev(Mean, Sd) UCL	47.4
97.5% Chebyshev(Mean, Sd) UCL	53.64	99% Chebyshev(Mean, Sd) UCL	65.9

APPENDIX B-1A2
Metals in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - milligrams per kilogram (mg/kg)

Suggested UCL to Use	
95% H-UCL	39.76

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

ProUCL computes and outputs H-statistic based UCLs for historical reasons only.
H-statistic often results in unstable (both high and low) values of UCL95 as shown in examples in the Technical Guide.
It is therefore recommended to avoid the use of H-statistic based 95% UCLs.
Use of nonparametric methods are preferred to compute UCL95 for skewed data sets which do not follow a gamma distribution.

APPENDIX B-1A2
Metals in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - milligrams per kilogram (mg/kg)

Selenium

General Statistics

Total Number of Observations	101	Number of Distinct Observations	55
Number of Detects	44	Number of Non-Detects	57
Number of Distinct Detects	32	Number of Distinct Non-Detects	27
Minimum Detect	0.3	Minimum Non-Detect	0.1
Maximum Detect	4	Maximum Non-Detect	5
Variance Detects	1.228	Percent Non-Detects	56.44%
Mean Detects	1.525	SD Detects	1.108
Median Detects	1.04	CV Detects	0.727
Skewness Detects	1.068	Kurtosis Detects	-0.219
Mean of Logged Detects	0.178	SD of Logged Detects	0.707

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.819	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.944	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.24	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.132	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.825	KM Standard Error of Mean	0.104
KM SD	0.981	95% KM (BCA) UCL	0.982
95% KM (t) UCL	0.997	95% KM (Percentile Bootstrap) UCL	1.007
95% KM (z) UCL	0.996	95% KM Bootstrap t UCL	1.018
90% KM Chebyshev UCL	1.137	95% KM Chebyshev UCL	1.278
97.5% KM Chebyshev UCL	1.474	99% KM Chebyshev UCL	1.86

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	1.354	Anderson-Darling GOF Test	
5% A-D Critical Value	0.759	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.181	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.135	Detected Data Not Gamma Distributed at 5% Significance Level	

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	2.205	k star (bias corrected MLE)	2.07
Theta hat (MLE)	0.692	Theta star (bias corrected MLE)	0.737
nu hat (MLE)	194	nu star (bias corrected)	182.1
Mean (detects)	1.525		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.709
Maximum	4	Median	0.108
SD	1.038	CV	1.463
k hat (MLE)	0.363	k star (bias corrected MLE)	0.358
Theta hat (MLE)	1.956	Theta star (bias corrected MLE)	1.979
nu hat (MLE)	73.25	nu star (bias corrected)	72.41
Adjusted Level of Significance (β)	0.0476		
Approximate Chi Square Value (72.41, α)	53.81	Adjusted Chi Square Value (72.41, β)	53.58
95% Gamma Approximate UCL (use when n>=50)	0.954	95% Gamma Adjusted UCL (use when n<50)	0.958

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.825	SD (KM)	0.981
Variance (KM)	0.962	SE of Mean (KM)	0.104
k hat (KM)	0.707	k star (KM)	0.692
nu hat (KM)	142.7	nu star (KM)	139.8
theta hat (KM)	1.167	theta star (KM)	1.191
80% gamma percentile (KM)	1.356	90% gamma percentile (KM)	2.075
95% gamma percentile (KM)	2.818	99% gamma percentile (KM)	4.593

APPENDIX B-1A2
Metals in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - milligrams per kilogram (mg/kg)

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (139.83, α)	113.5	Adjusted Chi Square Value (139.83, β)	113.2
95% Gamma Approximate KM-UCL (use when n>=50)	1.016	95% Gamma Adjusted KM-UCL (use when n<50)	1.019

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.942	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.944	Detected Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.138	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.132	Detected Data Not Lognormal at 5% Significance Level	

Detected Data Not Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.827	Mean in Log Scale	-0.696
SD in Original Scale	0.962	SD in Log Scale	0.969
95% t UCL (assumes normality of ROS data)	0.986	95% Percentile Bootstrap UCL	0.992
95% BCA Bootstrap UCL	1.012	95% Bootstrap t UCL	1.014
95% H-UCL (Log ROS)	0.985		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-0.808	KM Geo Mean	0.446
KM SD (logged)	1.124	95% Critical H Value (KM-Log)	2.321
KM Standard Error of Mean (logged)	0.18	95% H-UCL (KM -Log)	1.088
KM SD (logged)	1.124	95% Critical H Value (KM-Log)	2.321
KM Standard Error of Mean (logged)	0.18		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.91	Mean in Log Scale	-0.6
SD in Original Scale	0.993	SD in Log Scale	1.004
95% t UCL (Assumes normality)	1.074	95% H-Stat UCL	1.134

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Data do not follow a Discernible Distribution at 5% Significance Level

Suggested UCL to Use

95% KM (Chebyshev) UCL	1.278

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

APPENDIX B-1A2
Metals in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - milligrams per kilogram (mg/kg)

Silver

General Statistics			
Total Number of Observations	101	Number of Distinct Observations	30
Number of Detects	25	Number of Non-Detects	76
Number of Distinct Detects	19	Number of Distinct Non-Detects	15
Minimum Detect	0.13	Minimum Non-Detect	0.11
Maximum Detect	2.3	Maximum Non-Detect	0.89
Variance Detects	0.305	Percent Non-Detects	75.25%
Mean Detects	0.661	SD Detects	0.552
Median Detects	0.54	CV Detects	0.835
Skewness Detects	1.719	Kurtosis Detects	3.006
Mean of Logged Detects	-0.707	SD of Logged Detects	0.781

Normal GOF Test on Detects Only			
Shapiro Wilk Test Statistic	0.801	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.918	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.199	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.173	Detected Data Not Normal at 5% Significance Level	
Detected Data Not Normal at 5% Significance Level			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
KM Mean	0.255	KM Standard Error of Mean	0.037
KM SD	0.36	95% KM (BCA) UCL	0.326
95% KM (t) UCL	0.316	95% KM (Percentile Bootstrap) UCL	0.323
95% KM (z) UCL	0.316	95% KM Bootstrap t UCL	0.34
90% KM Chebyshev UCL	0.366	95% KM Chebyshev UCL	0.416
97.5% KM Chebyshev UCL	0.486	99% KM Chebyshev UCL	0.623

Gamma GOF Tests on Detected Observations Only			
A-D Test Statistic	0.602	Anderson-Darling GOF Test	
5% A-D Critical Value	0.758	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.137	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.177	Detected data appear Gamma Distributed at 5% Significance Level	
Detected data appear Gamma Distributed at 5% Significance Level			

Gamma Statistics on Detected Data Only			
k hat (MLE)	1.855	k star (bias corrected MLE)	1.659
Theta hat (MLE)	0.357	Theta star (bias corrected MLE)	0.399
nu hat (MLE)	92.73	nu star (bias corrected)	82.94
Mean (detects)	0.661		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.175
Maximum	2.3	Median	0.01
SD	0.39	CV	2.228
k hat (MLE)	0.364	k star (bias corrected MLE)	0.359
Theta hat (MLE)	0.482	Theta star (bias corrected MLE)	0.488
nu hat (MLE)	73.43	nu star (bias corrected)	72.59
Adjusted Level of Significance (β)	0.0476		
Approximate Chi Square Value (72.59, α)	53.97	Adjusted Chi Square Value (72.59, β)	53.74
95% Gamma Approximate UCL (use when n>=50)	0.236	95% Gamma Adjusted UCL (use when n<50)	0.237

Estimates of Gamma Parameters using KM Estimates			
Mean (KM)	0.255	SD (KM)	0.36
Variance (KM)	0.13	SE of Mean (KM)	0.037
k hat (KM)	0.501	k star (KM)	0.493
nu hat (KM)	101.2	nu star (KM)	99.49
theta hat (KM)	0.509	theta star (KM)	0.518
80% gamma percentile (KM)	0.418	90% gamma percentile (KM)	0.692
95% gamma percentile (KM)	0.985	99% gamma percentile (KM)	1.705

APPENDIX B-1A2
Metals in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - milligrams per kilogram (mg/kg)

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (99.49, α)	77.48	Adjusted Chi Square Value (99.49, β)	77.2
95% Gamma Approximate KM-UCL (use when n>=50)	0.327	95% Gamma Adjusted KM-UCL (use when n<50)	0.329

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.956	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.918	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.126	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.173	Detected Data appear Lognormal at 5% Significance Level	
Detected Data appear Lognormal at 5% Significance Level			

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.21	Mean in Log Scale	-2.527
SD in Original Scale	0.378	SD in Log Scale	1.339
95% t UCL (assumes normality of ROS data)	0.272	95% Percentile Bootstrap UCL	0.273
95% BCA Bootstrap UCL	0.285	95% Bootstrap t UCL	0.29
95% H-UCL (Log ROS)	0.275		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-1.796	KM Geo Mean	0.166
KM SD (logged)	0.758	95% Critical H Value (KM-Log)	2.003
KM Standard Error of Mean (logged)	0.0798	95% H-UCL (KM -Log)	0.257
KM SD (logged)	0.758	95% Critical H Value (KM-Log)	2.003
KM Standard Error of Mean (logged)	0.0798		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.261	Mean in Log Scale	-1.876
SD in Original Scale	0.367	SD in Log Scale	0.926
95% t UCL (Assumes normality)	0.322	95% H-Stat UCL	0.287

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Detected Data appear Gamma Distributed at 5% Significance Level

Suggested UCL to Use

95% KM Approximate Gamma UCL	0.327	95% GROS Approximate Gamma UCL	0.236

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

APPENDIX B-1A2
Metals in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - milligrams per kilogram (mg/kg)

Thallium

General Statistics

Total Number of Observations	72	Number of Distinct Observations	31
Number of Detects	9	Number of Non-Detects	63
Number of Distinct Detects	9	Number of Distinct Non-Detects	27
Minimum Detect	0.45	Minimum Non-Detect	0.3
Maximum Detect	1.7	Maximum Non-Detect	5
Variance Detects	0.164	Percent Non-Detects	87.50%
Mean Detects	0.847	SD Detects	0.405
Median Detects	0.8	CV Detects	0.478
Skewness Detects	1.156	Kurtosis Detects	1.383
Mean of Logged Detects	-0.26	SD of Logged Detects	0.453

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.878	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.829	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.197	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.274	Detected Data appear Normal at 5% Significance Level	

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.388	KM Standard Error of Mean	0.0328
KM SD	0.239	95% KM (BCA) UCL	0.473
95% KM (t) UCL	0.442	95% KM (Percentile Bootstrap) UCL	0.454
95% KM (z) UCL	0.442	95% KM Bootstrap t UCL	0.447
90% KM Chebyshev UCL	0.486	95% KM Chebyshev UCL	0.531
97.5% KM Chebyshev UCL	0.592	99% KM Chebyshev UCL	0.714

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.365	Anderson-Darling GOF Test	
5% A-D Critical Value	0.723	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.21	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.28	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	5.492	k star (bias corrected MLE)	3.735
Theta hat (MLE)	0.154	Theta star (bias corrected MLE)	0.227
nu hat (MLE)	98.85	nu star (bias corrected)	67.23
Mean (detects)	0.847		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.131
Maximum	1.7	Median	0.01
SD	0.313	CV	2.388
k hat (MLE)	0.372	k star (bias corrected MLE)	0.365
Theta hat (MLE)	0.353	Theta star (bias corrected MLE)	0.359
nu hat (MLE)	53.51	nu star (bias corrected)	52.62
Adjusted Level of Significance (β)	0.0467		
Approximate Chi Square Value (52.62, α)	36.95	Adjusted Chi Square Value (52.62, β)	36.69
95% Gamma Approximate UCL (use when n>=50)	0.187	95% Gamma Adjusted UCL (use when n<50)	0.188

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.388	SD (KM)	0.239
Variance (KM)	0.0572	SE of Mean (KM)	0.0328
k hat (KM)	2.628	k star (KM)	2.527
nu hat (KM)	378.4	nu star (KM)	363.9
theta hat (KM)	0.148	theta star (KM)	0.153
80% gamma percentile (KM)	0.565	90% gamma percentile (KM)	0.714
95% gamma percentile (KM)	0.856	99% gamma percentile (KM)	1.165

APPENDIX B-1A2
Metals in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - milligrams per kilogram (mg/kg)

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (363.93, α)	320.7	Adjusted Chi Square Value (363.93, β)	319.9
95% Gamma Approximate KM-UCL (use when n>=50)	0.44	95% Gamma Adjusted KM-UCL (use when n<50)	0.441

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.928	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.829	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.192	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.274	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.246	Mean in Log Scale	-1.75
SD in Original Scale	0.278	SD in Log Scale	0.756
95% t UCL (assumes normality of ROS data)	0.3	95% Percentile Bootstrap UCL	0.305
95% BCA Bootstrap UCL	0.316	95% Bootstrap t UCL	0.323
95% H-UCL (Log ROS)	0.278		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-1.044	KM Geo Mean	0.352
KM SD (logged)	0.374	95% Critical H Value (KM-Log)	1.781
KM Standard Error of Mean (logged)	0.0538	95% H-UCL (KM -Log)	0.409
KM SD (logged)	0.374	95% Critical H Value (KM-Log)	1.781
KM Standard Error of Mean (logged)	0.0538		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.541	Mean in Log Scale	-1.008
SD in Original Scale	0.65	SD in Log Scale	0.771
95% t UCL (Assumes normality)	0.669	95% H-Stat UCL	0.593

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Detected Data appear Normal Distributed at 5% Significance Level

Suggested UCL to Use
95% KM (t) UCL 0.442

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

APPENDIX B-1A2
Metals in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - milligrams per kilogram (mg/kg)

Vanadium

General Statistics

Total Number of Observations	101	Number of Distinct Observations	64
		Number of Missing Observations	0
Minimum	4.4	Mean	62.72
Maximum	280	Median	58
SD	39.32	Std. Error of Mean	3.912
Coefficient of Variation	0.627	Skewness	2.248

Normal GOF Test

Shapiro Wilk Test Statistic	0.852	Shapiro Wilk GOF Test	
5% Shapiro Wilk P Value	7.44E-15	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.12	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.0884	Data Not Normal at 5% Significance Level	
Data Not Normal at 5% Significance Level			

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	69.22	95% Adjusted-CLT UCL (Chen-1995)	70.09
		95% Modified-t UCL (Johnson-1978)	69.36

Gamma GOF Test

A-D Test Statistic	0.615	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.759	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.0673	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.0899	Detected data appear Gamma Distributed at 5% Significance Level	
Detected data appear Gamma Distributed at 5% Significance Level			

Gamma Statistics

k hat (MLE)	2.911	k star (bias corrected MLE)	2.831
Theta hat (MLE)	21.55	Theta star (bias corrected MLE)	22.16
nu hat (MLE)	588	nu star (bias corrected)	571.9
MLE Mean (bias corrected)	62.72	MLE Sd (bias corrected)	37.28
		Approximate Chi Square Value (0.05)	517.4
Adjusted Level of Significance	0.0476	Adjusted Chi Square Value	516.7

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50)	69.33	95% Adjusted Gamma UCL (use when n<50)	69.43

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.947	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk P Value	0.00133	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.0963	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.0884	Data Not Lognormal at 5% Significance Level	
Data Not Lognormal at 5% Significance Level			

Lognormal Statistics

Minimum of Logged Data	1.482	Mean of logged Data	3.957
Maximum of Logged Data	5.635	SD of logged Data	0.649

Assuming Lognormal Distribution

95% H-UCL	73.14	90% Chebyshev (MVUE) UCL	78.01
95% Chebyshev (MVUE) UCL	84.17	97.5% Chebyshev (MVUE) UCL	92.72
99% Chebyshev (MVUE) UCL	109.5		

Nonparametric Distribution Free UCL Statistics
Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	69.16	95% Jackknife UCL	69.22
95% Standard Bootstrap UCL	69.11	95% Bootstrap-t UCL	70.52
95% Hall's Bootstrap UCL	70.94	95% Percentile Bootstrap UCL	69.31
95% BCA Bootstrap UCL	70.27		
90% Chebyshev(Mean, Sd) UCL	74.46	95% Chebyshev(Mean, Sd) UCL	79.78
97.5% Chebyshev(Mean, Sd) UCL	87.15	99% Chebyshev(Mean, Sd) UCL	101.6

APPENDIX B-1A2
Metals in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - milligrams per kilogram (mg/kg)

Suggested UCL to Use	
95% Approximate Gamma UCL	69.33

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

APPENDIX B-1A2
Metals in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - milligrams per kilogram (mg/kg)

Zinc

General Statistics			
Total Number of Observations	101	Number of Distinct Observations	62
		Number of Missing Observations	0
Minimum	29	Mean	147.9
Maximum	1300	Median	76
SD	200.3	Std. Error of Mean	19.93
Coefficient of Variation	1.355	Skewness	3.419
Normal GOF Test			
Shapiro Wilk Test Statistic	0.579	Shapiro Wilk GOF Test	
5% Shapiro Wilk P Value	0	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.298	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.0884	Data Not Normal at 5% Significance Level	
Data Not Normal at 5% Significance Level			
Assuming Normal Distribution			
95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	181	95% Adjusted-CLT UCL (Chen-1995)	187.9
		95% Modified-t UCL (Johnson-1978)	182.1
Gamma GOF Test			
A-D Test Statistic	6.432	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.777	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.198	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.0914	Data Not Gamma Distributed at 5% Significance Level	
Data Not Gamma Distributed at 5% Significance Level			
Gamma Statistics			
k hat (MLE)	1.225	k star (bias corrected MLE)	1.195
Theta hat (MLE)	120.7	Theta star (bias corrected MLE)	123.7
nu hat (MLE)	247.5	nu star (bias corrected)	241.5
MLE Mean (bias corrected)	147.9	MLE Sd (bias corrected)	135.2
		Approximate Chi Square Value (0.05)	206.5
Adjusted Level of Significance	0.0476	Adjusted Chi Square Value	206
Assuming Gamma Distribution			
95% Approximate Gamma UCL (use when n>=50))	172.9	95% Adjusted Gamma UCL (use when n<50)	173.3
Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.901	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk P Value	6.46E-09	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.116	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.0884	Data Not Lognormal at 5% Significance Level	
Data Not Lognormal at 5% Significance Level			
Lognormal Statistics			
Minimum of Logged Data	3.367	Mean of logged Data	4.536
Maximum of Logged Data	7.17	SD of logged Data	0.851
Assuming Lognormal Distribution			
95% H-UCL	159.9	90% Chebyshev (MVUE) UCL	172.3
95% Chebyshev (MVUE) UCL	190	97.5% Chebyshev (MVUE) UCL	214.5
99% Chebyshev (MVUE) UCL	262.6		
Nonparametric Distribution Free UCL Statistics			
Data do not follow a Discernible Distribution (0.05)			
Nonparametric Distribution Free UCLs			
95% CLT UCL	180.7	95% Jackknife UCL	181
95% Standard Bootstrap UCL	180.8	95% Bootstrap-t UCL	193.3
95% Hall's Bootstrap UCL	193.6	95% Percentile Bootstrap UCL	184
95% BCA Bootstrap UCL	187.2		
90% Chebyshev(Mean, Sd) UCL	207.7	95% Chebyshev(Mean, Sd) UCL	234.8
97.5% Chebyshev(Mean, Sd) UCL	272.4	99% Chebyshev(Mean, Sd) UCL	346.2

APPENDIX B-1A2
Metals in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - milligrams per kilogram (mg/kg)

Suggested UCL to Use	
95% Chebyshev (Mean, Sd) UCL	234.8

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

APPENDIX B-1B1
OCPs and PCBs in Soil - All Areas Except Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg)

4,4'-DDD

General Statistics			
Total Number of Observations	112	Number of Distinct Observations	28
Number of Detects	23	Number of Non-Detects	89
Number of Distinct Detects	22	Number of Distinct Non-Detects	8
Minimum Detect	0.62	Minimum Non-Detect	0.58
Maximum Detect	120	Maximum Non-Detect	3
Variance Detects	619.8	Percent Non-Detects	79.46%
Mean Detects	10.94	SD Detects	24.9
Median Detects	3.9	CV Detects	2.276
Skewness Detects	4.195	Kurtosis Detects	18.6
Mean of Logged Detects	1.457	SD of Logged Detects	1.183

Normal GOF Test on Detects Only			
Shapiro Wilk Test Statistic	0.406	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.914	Detected Data Not Normal at 5% Significance Leve	
Lilliefors Test Statistic	0.357	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.18	Detected Data Not Normal at 5% Significance Leve	
Detected Data Not Normal at 5% Significance Leve			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
KM Mean	2.715	KM Standard Error of Mean	1.14
KM SD	11.8	95% KM (BCA) UCL	4.771
95% KM (t) UCL	4.606	95% KM (Percentile Bootstrap) UCL	4.87
95% KM (z) UCL	4.59	95% KM Bootstrap t UCL	10.37
90% KM Chebyshev UCL	6.135	95% KM Chebyshev UCL	7.685
97.5% KM Chebyshev UCL	9.835	99% KM Chebyshev UCL	14.06

Gamma GOF Tests on Detected Observations Only			
A-D Test Statistic	1.969	Anderson-Darling GOF Test	
5% A-D Critical Value	0.791	Detected Data Not Gamma Distributed at 5% Significance Leve	
K-S Test Statistic	0.242	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.19	Detected Data Not Gamma Distributed at 5% Significance Leve	
Detected Data Not Gamma Distributed at 5% Significance Leve			

Gamma Statistics on Detected Data Only			
k hat (MLE)	0.653	k star (bias corrected MLE)	0.597
Theta hat (MLE)	16.76	Theta star (bias corrected MLE)	18.34
nu hat (MLE)	30.03	nu star (bias corrected)	27.44
Mean (detects)	10.94		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	2.255
Maximum	120	Median	0.01
SD	11.94	CV	5.295
k hat (MLE)	0.179	k star (bias corrected MLE)	0.18
Theta hat (MLE)	12.57	Theta star (bias corrected MLE)	12.49
nu hat (MLE)	40.17	nu star (bias corrected)	40.43
Adjusted Level of Significance (β)	0.0479		
Approximate Chi Square Value (40.43, α)	26.86	Adjusted Chi Square Value (40.43, β)	26.72
95% Gamma Approximate UCL (use when n>=50)	3.394	95% Gamma Adjusted UCL (use when n<50)	3.412

Estimates of Gamma Parameters using KM Estimates			
Mean (KM)	2.715	SD (KM)	11.8
Variance (KM)	139.2	SE of Mean (KM)	1.14
k hat (KM)	0.0529	k star (KM)	0.0575
nu hat (KM)	11.86	nu star (KM)	12.87

APPENDIX B-1B1
OCPs and PCBs in Soil - All Areas Except Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg)

theta hat (KM)	51.29	theta star (KM)	47.24
80% gamma percentile (KM)	0.579	90% gamma percentile (KM)	4.886
95% gamma percentile (KM)	15.06	99% gamma percentile (KM)	55.79

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (12.87, α)	5.808	Adjusted Chi Square Value (12.87, β)	5.746
95% Gamma Approximate KM-UCL (use when n>=50)	6.018	95% Gamma Adjusted KM-UCL (use when n<50)	6.083

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.938	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.914	Detected Data appear Lognormal at 5% Significance Leve	
Lilliefors Test Statistic	0.152	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.18	Detected Data appear Lognormal at 5% Significance Leve	

Detected Data appear Lognormal at 5% Significance Leve

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	2.357	Mean in Log Scale	-2.151
SD in Original Scale	11.92	SD in Log Scale	2.476
95% t UCL (assumes normality of ROS data)	4.225	95% Percentile Bootstrap UCL	4.421
95% BCA Bootstrap UCL	5.793	95% Bootstrap t UCL	9.882
95% H-UCL (Log ROS)	6.271		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distributior

KM Mean (logged)	-0.125	KM Geo Mean	0.882
KM SD (logged)	0.964	95% Critical H Value (KM-Log)	2.183
KM Standard Error of Mean (logged)	0.0935	95% H-UCL (KM -Log)	1.714
KM SD (logged)	0.964	95% Critical H Value (KM-Log)	2.183
KM Standard Error of Mean (logged)	0.0935		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	2.625	Mean in Log Scale	-0.381
SD in Original Scale	11.87	SD in Log Scale	1.153
95% t UCL (Assumes normality)	4.486	95% H-Stat UCL	1.718

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Detected Data appear Lognormal Distributed at 5% Significance Leve

Suggested UCL to Use

KM H-UCL	1.714

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
Recommendations are based upon data size, data distribution, and skewness
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statisticiar

APPENDIX B-1B1
OCPs and PCBs in Soil - All Areas Except Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg)

4,4'-DDE

General Statistics

Total Number of Observations	112	Number of Distinct Observations	38
Number of Detects	36	Number of Non-Detects	76
Number of Distinct Detects	30	Number of Distinct Non-Detects	10
Minimum Detect	0.44	Minimum Non-Detect	0.4
Maximum Detect	280	Maximum Non-Detect	2.1
Variance Detects	2373	Percent Non-Detects	67.86%
Mean Detects	15.54	SD Detects	48.71
Median Detects	2.7	CV Detects	3.134
Skewness Detects	4.964	Kurtosis Detects	26.43
Mean of Logged Detects	1.204	SD of Logged Detects	1.426

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.333	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.935	Detected Data Not Normal at 5% Significance Leve	
Lilliefors Test Statistic	0.397	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.145	Detected Data Not Normal at 5% Significance Leve	
Detected Data Not Normal at 5% Significance Leve			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	5.289	KM Standard Error of Mean	2.696
KM SD	28.13	95% KM (BCA) UCL	9.832
95% KM (t) UCL	9.761	95% KM (Percentile Bootstrap) UCL	10.13
95% KM (z) UCL	9.723	95% KM Bootstrap t UCL	30.41
90% KM Chebyshev UCL	13.38	95% KM Chebyshev UCL	17.04
97.5% KM Chebyshev UCL	22.12	99% KM Chebyshev UCL	32.11

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	4.514	Anderson-Darling GOF Test	
5% A-D Critical Value	0.829	Detected Data Not Gamma Distributed at 5% Significance Leve	
K-S Test Statistic	0.315	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.157	Detected Data Not Gamma Distributed at 5% Significance Leve	
Detected Data Not Gamma Distributed at 5% Significance Leve			

Gamma Statistics on Detected Data Only

k hat (MLE)	0.423	k star (bias corrected MLE)	0.407
Theta hat (MLE)	36.7	Theta star (bias corrected MLE)	38.22
nu hat (MLE)	30.49	nu star (bias corrected)	29.28
Mean (detects)	15.54		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	5.003
Maximum	280	Median	0.01
SD	28.31	CV	5.658
k hat (MLE)	0.173	k star (bias corrected MLE)	0.174
Theta hat (MLE)	28.91	Theta star (bias corrected MLE)	28.69
nu hat (MLE)	38.77	nu star (bias corrected)	39.06
Adjusted Level of Significance (β)	0.0479		
Approximate Chi Square Value (39.06, α)	25.74	Adjusted Chi Square Value (39.06, β)	25.6
95% Gamma Approximate UCL (use when n>=50)	7.59	95% Gamma Adjusted UCL (use when n<50)	7.632

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	5.289	SD (KM)	28.13
Variance (KM)	791.3	SE of Mean (KM)	2.696
k hat (KM)	0.0354	k star (KM)	0.0404
nu hat (KM)	7.92	nu star (KM)	9.041

APPENDIX B-1B1
OCPs and PCBs in Soil - All Areas Except Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg)

theta hat (KM)	149.6	theta star (KM)	131
80% gamma percentile (KM)	0.303	90% gamma percentile (KM)	5.829
95% gamma percentile (KM)	25.51	99% gamma percentile (KM)	124.6

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (9.04, α)	3.352	Adjusted Chi Square Value (9.04, β)	3.307
95% Gamma Approximate KM-UCL (use when n>=50)	14.27	95% Gamma Adjusted KM-UCL (use when n<50)	14.46

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.892	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.935	Detected Data Not Lognormal at 5% Significance Leve	
Lilliefors Test Statistic	0.171	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.145	Detected Data Not Lognormal at 5% Significance Leve	
Detected Data Not Lognormal at 5% Significance Leve			

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	5.079	Mean in Log Scale	-1.69
SD in Original Scale	28.29	SD in Log Scale	2.525
95% t UCL (assumes normality of ROS data)	9.513	95% Percentile Bootstrap UCL	9.783
95% BCA Bootstrap UCL	13.55	95% Bootstrap t UCL	32.66
95% H-UCL (Log ROS)	11.6		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distributior

KM Mean (logged)	-0.201	KM Geo Mean	0.818
KM SD (logged)	1.264	95% Critical H Value (KM-Log)	2.476
KM Standard Error of Mean (logged)	0.122	95% H-UCL (KM -Log)	2.447
KM SD (logged)	1.264	95% Critical H Value (KM-Log)	2.476
KM Standard Error of Mean (logged)	0.122		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	5.271	Mean in Log Scale	-0.356
SD in Original Scale	28.26	SD in Log Scale	1.434
95% t UCL (Assumes normality)	9.7	95% H-Stat UCL	2.809
DL/2 is not a recommended method, provided for comparisons and historical reasons			

Nonparametric Distribution Free UCL Statistics
Data do not follow a Discernible Distribution at 5% Significance Leve

Suggested UCL to Use

95% KM (Chebyshev) UCL	17.04

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
Recommendations are based upon data size, data distribution, and skewness
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statisticiar

APPENDIX B-1B1
OCPs and PCBs in Soil - All Areas Except Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg)

4,4'-DDT

General Statistics

Total Number of Observations	112	Number of Distinct Observations	42
Number of Detects	36	Number of Non-Detects	76
Number of Distinct Detects	33	Number of Distinct Non-Detects	10
Minimum Detect	1.2	Minimum Non-Detect	0.39
Maximum Detect	220	Maximum Non-Detect	2
Variance Detects	1451	Percent Non-Detects	67.86%
Mean Detects	20.28	SD Detects	38.09
Median Detects	9.8	CV Detects	1.878
Skewness Detects	4.49	Kurtosis Detects	22.69
Mean of Logged Detects	2.233	SD of Logged Detects	1.202

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.474	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.935	Detected Data Not Normal at 5% Significance Leve	
Lilliefors Test Statistic	0.308	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.145	Detected Data Not Normal at 5% Significance Leve	
Detected Data Not Normal at 5% Significance Leve			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	6.792	KM Standard Error of Mean	2.226
KM SD	23.23	95% KM (BCA) UCL	11.03
95% KM (t) UCL	10.48	95% KM (Percentile Bootstrap) UCL	10.76
95% KM (z) UCL	10.45	95% KM Bootstrap t UCL	15.04
90% KM Chebyshev UCL	13.47	95% KM Chebyshev UCL	16.5
97.5% KM Chebyshev UCL	20.69	99% KM Chebyshev UCL	28.94

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	1.139	Anderson-Darling GOF Test	
5% A-D Critical Value	0.787	Detected Data Not Gamma Distributed at 5% Significance Leve	
K-S Test Statistic	0.156	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.153	Detected Data Not Gamma Distributed at 5% Significance Leve	
Detected Data Not Gamma Distributed at 5% Significance Leve			

Gamma Statistics on Detected Data Only

k hat (MLE)	0.769	k star (bias corrected MLE)	0.723
Theta hat (MLE)	26.38	Theta star (bias corrected MLE)	28.05
nu hat (MLE)	55.34	nu star (bias corrected)	52.07
Mean (detects)	20.28		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	6.526
Maximum	220	Median	0.01
SD	23.41	CV	3.587
k hat (MLE)	0.175	k star (bias corrected MLE)	0.177
Theta hat (MLE)	37.22	Theta star (bias corrected MLE)	36.95
nu hat (MLE)	39.28	nu star (bias corrected)	39.56
Adjusted Level of Significance (β)	0.0479		
Approximate Chi Square Value (39.56, α)	26.15	Adjusted Chi Square Value (39.56, β)	26.01
95% Gamma Approximate UCL (use when n>=50)	9.872	95% Gamma Adjusted UCL (use when n<50)	9.925

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	6.792	SD (KM)	23.23
Variance (KM)	539.6	SE of Mean (KM)	2.226
k hat (KM)	0.0855	k star (KM)	0.0892
nu hat (KM)	19.15	nu star (KM)	19.97

APPENDIX B-1B1
OCPs and PCBs in Soil - All Areas Except Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg)

theta hat (KM)	79.44	theta star (KM)	76.18
80% gamma percentile (KM)	3.937	90% gamma percentile (KM)	17.14
95% gamma percentile (KM)	39.58	99% gamma percentile (KM)	114.2

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (19.97, α)	10.83	Adjusted Chi Square Value (19.97, β)	10.74
95% Gamma Approximate KM-UCL (use when n>=50)	12.53	95% Gamma Adjusted KM-UCL (use when n<50)	12.63

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.976	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.935	Detected Data appear Lognormal at 5% Significance Leve	
Lilliefors Test Statistic	0.059	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.145	Detected Data appear Lognormal at 5% Significance Leve	
Detected Data appear Lognormal at 5% Significance Leve			

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	6.799	Mean in Log Scale	-0.364
SD in Original Scale	23.33	SD in Log Scale	2.231
95% t UCL (assumes normality of ROS data)	10.46	95% Percentile Bootstrap UCL	10.73
95% BCA Bootstrap UCL	13.18	95% Bootstrap t UCL	14.76
95% H-UCL (Log ROS)	17.95		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distributior

KM Mean (logged)	0.0904	KM Geo Mean	1.095
KM SD (logged)	1.625	95% Critical H Value (KM-Log)	2.872
KM Standard Error of Mean (logged)	0.156	95% H-UCL (KM -Log)	6.386
KM SD (logged)	1.625	95% Critical H Value (KM-Log)	2.872
KM Standard Error of Mean (logged)	0.156		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	6.771	Mean in Log Scale	-0.0846
SD in Original Scale	23.34	SD in Log Scale	1.806
95% t UCL (Assumes normality)	10.43	95% H-Stat UCL	7.969
DL/2 is not a recommended method, provided for comparisons and historical reasons			

Nonparametric Distribution Free UCL Statistics
Detected Data appear Lognormal Distributed at 5% Significance Leve

Suggested UCL to Use

KM H-UCL	6.386

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
Recommendations are based upon data size, data distribution, and skewness
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statisticiar

APPENDIX B-1B1
OCPs and PCBs in Soil - All Areas Except Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg)

Aldrin

General Statistics

Total Number of Observations		112	Number of Distinct Observations	13
Number of Detects	D	0	Number of Non-Detects	112
Number of Distinct Detects		0	Number of Distinct Non-Detects	13

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV)

The data set for variable D was not processed!

alpha-BHC

General Statistics

Total Number of Observations		112	Number of Distinct Observations	9
Number of Detects		0	Number of Non-Detects	112
Number of Distinct Detects		0	Number of Distinct Non-Detects	9

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV)

The data set for variable E was not processed!

alpha-Chlordane

General Statistics

Total Number of Observations		111	Number of Distinct Observations	23
Number of Detects		15	Number of Non-Detects	96
Number of Distinct Detects		13	Number of Distinct Non-Detects	10
Minimum Detect		0.57	Minimum Non-Detect	0.38
Maximum Detect		61	Maximum Non-Detect	2
Variance Detects		237.1	Percent Non-Detects	86.49%
Mean Detects		6.848	SD Detects	15.4
Median Detects		2.1	CV Detects	2.248
Skewness Detects		3.547	Kurtosis Detects	13.07
Mean of Logged Detects		0.845	SD of Logged Detects	1.275

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.438	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.881	Detected Data Not Normal at 5% Significance Leve	
Lilliefors Test Statistic	0.396	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.22	Detected Data Not Normal at 5% Significance Leve	
Detected Data Not Normal at 5% Significance Leve			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	1.269	KM Standard Error of Mean	0.579
KM SD	5.897	95% KM (BCA) UCL	2.295
95% KM (t) UCL	2.23	95% KM (Percentile Bootstrap) UCL	2.274
95% KM (z) UCL	2.222	95% KM Bootstrap t UCL	8.801
90% KM Chebyshev UCL	3.007	95% KM Chebyshev UCL	3.794
97.5% KM Chebyshev UCL	4.887	99% KM Chebyshev UCL	7.034

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	1.765	Anderson-Darling GOF Test	
5% A-D Critical Value	0.788	Detected Data Not Gamma Distributed at 5% Significance Leve	
K-S Test Statistic	0.328	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.233	Detected Data Not Gamma Distributed at 5% Significance Leve	
Detected Data Not Gamma Distributed at 5% Significance Leve			

APPENDIX B-1B1
OCPs and PCBs in Soil - All Areas Except Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg)

Gamma Statistics on Detected Data Only			
k hat (MLE)	0.576	k star (bias corrected MLE)	0.505
Theta hat (MLE)	11.89	Theta star (bias corrected MLE)	13.55
nu hat (MLE)	17.28	nu star (bias corrected)	15.16
Mean (detects)	6.848		
Gamma ROS Statistics using Imputed Non-Detects			
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DL			
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20			
For such situations, GROS method may yield incorrect values of UCLs and BTV			
This is especially true when the sample size is small.			
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimate			
Minimum	0.01	Mean	0.934
Maximum	61	Median	0.01
SD	5.974	CV	6.396
k hat (MLE)	0.194	k star (bias corrected MLE)	0.195
Theta hat (MLE)	4.803	Theta star (bias corrected MLE)	4.784
nu hat (MLE)	43.18	nu star (bias corrected)	43.34
Adjusted Level of Significance (β)	0.0478		
Approximate Chi Square Value (43.34, α)	29.25	Adjusted Chi Square Value (43.34, β)	29.09
95% Gamma Approximate UCL (use when n>=50)	1.384	95% Gamma Adjusted UCL (use when n<50)	1.391
Estimates of Gamma Parameters using KM Estimates			
Mean (KM)	1.269	SD (KM)	5.897
Variance (KM)	34.78	SE of Mean (KM)	0.579
k hat (KM)	0.0463	k star (KM)	0.051
nu hat (KM)	10.27	nu star (KM)	11.33
theta hat (KM)	27.41	theta star (KM)	24.86
80% gamma percentile (KM)	0.185	90% gamma percentile (KM)	1.988
95% gamma percentile (KM)	6.796	99% gamma percentile (KM)	27.37
Gamma Kaplan-Meier (KM) Statistics			
Approximate Chi Square Value (11.33, α)	4.789	Adjusted Chi Square Value (11.33, β)	4.733
95% Gamma Approximate KM-UCL (use when n>=50)	3.001	95% Gamma Adjusted KM-UCL (use when n<50)	3.037
Lognormal GOF Test on Detected Observations Only			
Shapiro Wilk Test Statistic	0.864	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.881	Detected Data Not Lognormal at 5% Significance Leve	
Lilliefors Test Statistic	0.224	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.22	Detected Data Not Lognormal at 5% Significance Leve	
Detected Data Not Lognormal at 5% Significance Leve			
Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	0.974	Mean in Log Scale	-3.749
SD in Original Scale	5.969	SD in Log Scale	2.709
95% t UCL (assumes normality of ROS data)	1.914	95% Percentile Bootstrap UCL	2.076
95% BCA Bootstrap UCL	2.849	95% Bootstrap t UCL	4.876
95% H-UCL (Log ROS)	2.747		
Statistics using KM estimates on Logged Data and Assuming Lognormal Distributior			
KM Mean (logged)	-0.7	KM Geo Mean	0.497
KM SD (logged)	0.774	95% Critical H Value (KM-Log)	2.022
KM Standard Error of Mean (logged)	0.0777	95% H-UCL (KM -Log)	0.778
KM SD (logged)	0.774	95% Critical H Value (KM-Log)	2.022
KM Standard Error of Mean (logged)	0.0777		
DL/2 Statistics			
DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	1.305	Mean in Log Scale	-0.843
SD in Original Scale	5.927	SD in Log Scale	1.051
95% t UCL (Assumes normality)	2.238	95% H-Stat UCL	0.937
DL/2 is not a recommended method, provided for comparisons and historical reason			

APPENDIX B-1B1
OCPs and PCBs in Soil - All Areas Except Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg)

Nonparametric Distribution Free UCL Statistics
Data do not follow a Discernible Distribution at 5% Significance Leve

Suggested UCL to Use
95% KM (Chebyshev) UCL 3.794

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
Recommendations are based upon data size, data distribution, and skewness
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statisticiar

APPENDIX B-1B1
OCPs and PCBs in Soil - All Areas Except Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg)

beta-BHC

General Statistics

Total Number of Observations	112	Number of Distinct Observations	11
Number of Detects	0	Number of Non-Detects	112
Number of Distinct Detects	0	Number of Distinct Non-Detects	11

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV)

The data set for variable G was not processed!

APPENDIX B-1B1
OCPs and PCBs in Soil - All Areas Except Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg)

Chlordane

General Statistics			
Total Number of Observations	112	Number of Distinct Observations	23
Number of Detects	8	Number of Non-Detects	104
Number of Distinct Detects	7	Number of Distinct Non-Detects	17
Minimum Detect	9.7	Minimum Non-Detect	2.8
Maximum Detect	340	Maximum Non-Detect	16
Variance Detects	12083	Percent Non-Detects	92.86%
Mean Detects	96.71	SD Detects	109.9
Median Detects	42	CV Detects	1.137
Skewness Detects	1.892	Kurtosis Detects	3.612
Mean of Logged Detects	4.057	SD of Logged Detects	1.102

Normal GOF Test on Detects Only			
Shapiro Wilk Test Statistic	0.757	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.818	Detected Data Not Normal at 5% Significance Leve	
Lilliefors Test Statistic	0.303	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.283	Detected Data Not Normal at 5% Significance Leve	
Detected Data Not Normal at 5% Significance Leve			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
KM Mean	9.524	KM Standard Error of Mean	3.698
KM SD	36.61	95% KM (BCA) UCL	16.38
95% KM (t) UCL	15.66	95% KM (Percentile Bootstrap) UCL	15.61
95% KM (z) UCL	15.61	95% KM Bootstrap t UCL	24.64
90% KM Chebyshev UCL	20.62	95% KM Chebyshev UCL	25.64
97.5% KM Chebyshev UCL	32.62	99% KM Chebyshev UCL	46.32

Gamma GOF Tests on Detected Observations Only			
A-D Test Statistic	0.438	Anderson-Darling GOF Test	
5% A-D Critical Value	0.734	Detected data appear Gamma Distributed at 5% Significance Leve	
K-S Test Statistic	0.266	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.301	Detected data appear Gamma Distributed at 5% Significance Leve	
Detected data appear Gamma Distributed at 5% Significance Leve			

Gamma Statistics on Detected Data Only			
k hat (MLE)	1.108	k star (bias corrected MLE)	0.776
Theta hat (MLE)	87.31	Theta star (bias corrected MLE)	124.7
nu hat (MLE)	17.72	nu star (bias corrected)	12.41
Mean (detects)	96.71		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	6.917
Maximum	340	Median	0.01
SD	37.25	CV	5.385
k hat (MLE)	0.132	k star (bias corrected MLE)	0.135
Theta hat (MLE)	52.33	Theta star (bias corrected MLE)	51.4
nu hat (MLE)	29.61	nu star (bias corrected)	30.15
Adjusted Level of Significance (β)	0.0479		
Approximate Chi Square Value (30.15, α)	18.61	Adjusted Chi Square Value (30.15, β)	18.49
95% Gamma Approximate UCL (use when n>=50)	11.21	95% Gamma Adjusted UCL (use when n<50)	11.28

Estimates of Gamma Parameters using KM Estimates			
Mean (KM)	9.524	SD (KM)	36.61
Variance (KM)	1340	SE of Mean (KM)	3.698
k hat (KM)	0.0677	k star (KM)	0.0718
nu hat (KM)	15.16	nu star (KM)	16.09

APPENDIX B-1B1
OCPs and PCBs in Soil - All Areas Except Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg)

theta hat (KM)	140.7	theta star (KM)	132.6
80% gamma percentile (KM)	3.619	90% gamma percentile (KM)	20.96
95% gamma percentile (KM)	54.94	99% gamma percentile (KM)	177.4

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (16.09, α)	8.026	Adjusted Chi Square Value (16.09, β)	7.952
95% Gamma Approximate KM-UCL (use when n>=50)	19.09	95% Gamma Adjusted KM-UCL (use when n<50)	19.27

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.951	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.818	Detected Data appear Lognormal at 5% Significance Leve	
Lilliefors Test Statistic	0.207	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.283	Detected Data appear Lognormal at 5% Significance Leve	
Detected Data appear Lognormal at 5% Significance Leve			

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	7.363	Mean in Log Scale	-2.353
SD in Original Scale	37.18	SD in Log Scale	2.974
95% t UCL (assumes normality of ROS data)	13.19	95% Percentile Bootstrap UCL	13.45
95% BCA Bootstrap UCL	16.9	95% Bootstrap t UCL	22.39
95% H-UCL (Log ROS)	28.77		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distributior

KM Mean (logged)	1.249	KM Geo Mean	3.486
KM SD (logged)	0.828	95% Critical H Value (KM-Log)	2.066
KM Standard Error of Mean (logged)	0.084	95% H-UCL (KM -Log)	5.779
KM SD (logged)	0.828	95% Critical H Value (KM-Log)	2.066
KM Standard Error of Mean (logged)	0.084		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	9.329	Mean in Log Scale	1.034
SD in Original Scale	36.84	SD in Log Scale	1.026
95% t UCL (Assumes normality)	15.1	95% H-Stat UCL	5.918

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Detected Data appear Gamma Distributed at 5% Significance Leve

Suggested UCL to Use

95% KM Approximate Gamma UCL	19.09

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
Recommendations are based upon data size, data distribution, and skewness
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statisticiar

APPENDIX B-1B1
OCPs and PCBs in Soil - All Areas Except Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg)

delta-BHC

General Statistics

Total Number of Observations	112	Number of Distinct Observations	12
Number of Detects	0	Number of Non-Detects	112
Number of Distinct Detects	0	Number of Distinct Non-Detects	12

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV)

The data set for variable I was not processed!

APPENDIX B-1B1
OCPs and PCBs in Soil - All Areas Except Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg)

Dieldrin

General Statistics			
Total Number of Observations	112	Number of Distinct Observations	21
Number of Detects	13	Number of Non-Detects	99
Number of Distinct Detects	13	Number of Distinct Non-Detects	9
Minimum Detect	1	Minimum Non-Detect	0.56
Maximum Detect	28	Maximum Non-Detect	2.9
Variance Detects	94.86	Percent Non-Detects	88.39%
Mean Detects	9.085	SD Detects	9.74
Median Detects	4.4	CV Detects	1.072
Skewness Detects	1.151	Kurtosis Detects	-0.302
Mean of Logged Detects	1.641	SD of Logged Detects	1.13

Normal GOF Test on Detects Only			
Shapiro Wilk Test Statistic	0.774	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.866	Detected Data Not Normal at 5% Significance Leve	
Lilliefors Test Statistic	0.293	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.234	Detected Data Not Normal at 5% Significance Leve	
Detected Data Not Normal at 5% Significance Leve			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
KM Mean	1.552	KM Standard Error of Mean	0.413
KM SD	4.197	95% KM (BCA) UCL	2.243
95% KM (t) UCL	2.237	95% KM (Percentile Bootstrap) UCL	2.291
95% KM (z) UCL	2.231	95% KM Bootstrap t UCL	2.59
90% KM Chebyshev UCL	2.791	95% KM Chebyshev UCL	3.352
97.5% KM Chebyshev UCL	4.13	99% KM Chebyshev UCL	5.66

Gamma GOF Tests on Detected Observations Only			
A-D Test Statistic	0.616	Anderson-Darling GOF Test	
5% A-D Critical Value	0.757	Detected data appear Gamma Distributed at 5% Significance Leve	
K-S Test Statistic	0.202	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.243	Detected data appear Gamma Distributed at 5% Significance Leve	
Detected data appear Gamma Distributed at 5% Significance Leve			

Gamma Statistics on Detected Data Only			
k hat (MLE)	1.018	k star (bias corrected MLE)	0.835
Theta hat (MLE)	8.922	Theta star (bias corrected MLE)	10.89
nu hat (MLE)	26.47	nu star (bias corrected)	21.7
Mean (detects)	9.085		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	1.063
Maximum	28	Median	0.01
SD	4.334	CV	4.076
k hat (MLE)	0.188	k star (bias corrected MLE)	0.189
Theta hat (MLE)	5.643	Theta star (bias corrected MLE)	5.616
nu hat (MLE)	42.21	nu star (bias corrected)	42.41
Adjusted Level of Significance (β)	0.0479		
Approximate Chi Square Value (42.41, α)	28.48	Adjusted Chi Square Value (42.41, β)	28.33
95% Gamma Approximate UCL (use when n>=50)	1.583	95% Gamma Adjusted UCL (use when n<50)	1.592

Estimates of Gamma Parameters using KM Estimates			
Mean (KM)	1.552	SD (KM)	4.197
Variance (KM)	17.62	SE of Mean (KM)	0.413
k hat (KM)	0.137	k star (KM)	0.139
nu hat (KM)	30.64	nu star (KM)	31.15

APPENDIX B-1B1
OCPs and PCBs in Soil - All Areas Except Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg)

theta hat (KM)	11.35	theta star (KM)	11.16
80% gamma percentile (KM)	1.582	90% gamma percentile (KM)	4.547
95% gamma percentile (KM)	8.663	99% gamma percentile (KM)	20.8

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (31.15, α)	19.4	Adjusted Chi Square Value (31.15, β)	19.28
95% Gamma Approximate KM-UCL (use when n>=50)	2.492	95% Gamma Adjusted KM-UCL (use when n<50)	2.508

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.931	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.866	Detected Data appear Lognormal at 5% Significance Leve	
Lilliefors Test Statistic	0.134	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.234	Detected Data appear Lognormal at 5% Significance Leve	
Detected Data appear Lognormal at 5% Significance Leve			

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	1.14	Mean in Log Scale	-3.325
SD in Original Scale	4.318	SD in Log Scale	2.754
95% t UCL (assumes normality of ROS data)	1.817	95% Percentile Bootstrap UCL	1.861
95% BCA Bootstrap UCL	2.027	95% Bootstrap t UCL	2.244
95% H-UCL (Log ROS)	4.885		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distributior

KM Mean (logged)	-0.319	KM Geo Mean	0.727
KM SD (logged)	0.802	95% Critical H Value (KM-Log)	2.045
KM Standard Error of Mean (logged)	0.0791	95% H-UCL (KM -Log)	1.172
KM SD (logged)	0.802	95% Critical H Value (KM-Log)	2.045
KM Standard Error of Mean (logged)	0.0791		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	1.451	Mean in Log Scale	-0.621
SD in Original Scale	4.246	SD in Log Scale	1.002
95% t UCL (Assumes normality)	2.117	95% H-Stat UCL	1.097

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Detected Data appear Gamma Distributed at 5% Significance Leve

Suggested UCL to Use

95% KM Approximate Gamma UCL	2.492

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
Recommendations are based upon data size, data distribution, and skewness
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statisticiar

APPENDIX B-1B1
OCPs and PCBs in Soil - All Areas Except Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg)

Endosulfan I

General Statistics

Total Number of Observations	112	Number of Distinct Observations	9
Number of Detects	0	Number of Non-Detects	112
Number of Distinct Detects	0	Number of Distinct Non-Detects	9

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV)

The data set for variable K was not processed!

Endosulfan II

General Statistics

Total Number of Observations	112	Number of Distinct Observations	13
Number of Detects	0	Number of Non-Detects	112
Number of Distinct Detects	0	Number of Distinct Non-Detects	13

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV)

The data set for variable L was not processed!

APPENDIX B-1B1
OCPs and PCBs in Soil - All Areas Except Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg)

Endosulfan sulfate

General Statistics

Total Number of Observations	112	Number of Distinct Observations	11
Number of Detects	0	Number of Non-Detects	112
Number of Distinct Detects	0	Number of Distinct Non-Detects	11

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV)

The data set for variable M was not processed!

APPENDIX B-1B1
OCPs and PCBs in Soil - All Areas Except Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg)

Endrin

General Statistics

Total Number of Observations	112	Number of Distinct Observations	17
Number of Detects	4	Number of Non-Detects	108
Number of Distinct Detects	4	Number of Distinct Non-Detects	13
Minimum Detect	2.8	Minimum Non-Detect	0.43
Maximum Detect	30	Maximum Non-Detect	2.3
Variance Detects	158.2	Percent Non-Detects	96.43%
Mean Detects	17.7	SD Detects	12.58
Median Detects	19	CV Detects	0.711
Skewness Detects	-0.355	Kurtosis Detects	-3.118
Mean of Logged Detects	2.543	SD of Logged Detects	1.087

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.933	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Normal at 5% Significance Leve	
Lilliefors Test Statistic	0.245	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.375	Detected Data appear Normal at 5% Significance Leve	
Detected Data appear Normal at 5% Significance Leve			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	1.047	KM Standard Error of Mean	0.416
KM SD	3.809	95% KM (BCA) UCL	N/A
95% KM (t) UCL	1.736	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	1.73	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	2.294	95% KM Chebyshev UCL	2.858
97.5% KM Chebyshev UCL	3.642	99% KM Chebyshev UCL	5.182

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.354	Anderson-Darling GOF Test	
5% A-D Critical Value	0.662	Detected data appear Gamma Distributed at 5% Significance Leve	
K-S Test Statistic	0.283	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.399	Detected data appear Gamma Distributed at 5% Significance Leve	
Detected data appear Gamma Distributed at 5% Significance Leve			

Gamma Statistics on Detected Data Only

k hat (MLE)	1.662	k star (bias corrected MLE)	0.582
Theta hat (MLE)	10.65	Theta star (bias corrected MLE)	30.41
nu hat (MLE)	13.29	nu star (bias corrected)	4.657
Mean (detects)	17.7		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.642
Maximum	30	Median	0.01
SD	3.892	CV	6.065
k hat (MLE)	0.19	k star (bias corrected MLE)	0.191
Theta hat (MLE)	3.379	Theta star (bias corrected MLE)	3.364
nu hat (MLE)	42.54	nu star (bias corrected)	42.73
Adjusted Level of Significance (β)	0.0479		
Approximate Chi Square Value (42.73, α)	28.75	Adjusted Chi Square Value (42.73, β)	28.6
95% Gamma Approximate UCL (use when n>=50)	0.954	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	1.047	SD (KM)	3.809
Variance (KM)	14.51	SE of Mean (KM)	0.416
k hat (KM)	0.0755	k star (KM)	0.0794
nu hat (KM)	16.92	nu star (KM)	17.8

APPENDIX B-1B1
OCPs and PCBs in Soil - All Areas Except Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg)

theta hat (KM)	13.86	theta star (KM)	13.18
80% gamma percentile (KM)	0.492	90% gamma percentile (KM)	2.471
95% gamma percentile (KM)	6.085	99% gamma percentile (KM)	18.6

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (17.80, α)	9.244	Adjusted Chi Square Value (17.80, β)	9.164
95% Gamma Approximate KM-UCL (use when n>=50)	2.015	95% Gamma Adjusted KM-UCL (use when n<50)	2.033

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.874	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Lognormal at 5% Significance Leve	
Lilliefors Test Statistic	0.245	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.375	Detected Data appear Lognormal at 5% Significance Leve	
Detected Data appear Lognormal at 5% Significance Leve			

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.685	Mean in Log Scale	-5.906
SD in Original Scale	3.889	SD in Log Scale	3.487
95% t UCL (assumes normality of ROS data)	1.295	95% Percentile Bootstrap UCL	1.384
95% BCA Bootstrap UCL	1.666	95% Bootstrap t UCL	2.509
95% H-UCL (Log ROS)	6.783		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distributior

KM Mean (logged)	-0.723	KM Geo Mean	0.485
KM SD (logged)	0.653	95% Critical H Value (KM-Log)	1.933
KM Standard Error of Mean (logged)	0.0713	95% H-UCL (KM -Log)	0.677
KM SD (logged)	0.653	95% Critical H Value (KM-Log)	1.933
KM Standard Error of Mean (logged)	0.0713		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	1.013	Mean in Log Scale	-0.963
SD in Original Scale	3.839	SD in Log Scale	0.885
95% t UCL (Assumes normality)	1.615	95% H-Stat UCL	0.674

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Detected Data appear Normal Distributed at 5% Significance Leve

Suggested UCL to Use

95% KM (t) UCL	1.736

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
Recommendations are based upon data size, data distribution, and skewness
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statisticiar

APPENDIX B-1B1
OCPs and PCBs in Soil - All Areas Except Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg)

Endrin aldehyde

General Statistics

Total Number of Observations	112	Number of Distinct Observations	11
Number of Detects	1	Number of Non-Detects	111
Number of Distinct Detects	1	Number of Distinct Non-Detects	10

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set
It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV)

The data set for variable O was not processed!

APPENDIX B-1B1
OCPs and PCBs in Soil - All Areas Except Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg)

Endrin ketone

General Statistics

Total Number of Observations	112	Number of Distinct Observations	10
Number of Detects	0	Number of Non-Detects	112
Number of Distinct Detects	0	Number of Distinct Non-Detects	10

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV)

The data set for variable P was not processed!

APPENDIX B-1B1
OCPs and PCBs in Soil - All Areas Except Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg)

gamma-BHC (Lindane)

General Statistics

Total Number of Observations	112	Number of Distinct Observations	10
Number of Detects	0	Number of Non-Detects	112
Number of Distinct Detects	0	Number of Distinct Non-Detects	10

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV)

The data set for variable Q was not processed!

gamma-Chlordane

General Statistics

Total Number of Observations	112	Number of Distinct Observations	23
Number of Detects	12	Number of Non-Detects	100
Number of Distinct Detects	12	Number of Distinct Non-Detects	13
Minimum Detect	0.82	Minimum Non-Detect	0.43
Maximum Detect	51	Maximum Non-Detect	2.3
Variance Detects	198.9	Percent Non-Detects	89.29%
Mean Detects	7.793	SD Detects	14.1
Median Detects	2.75	CV Detects	1.81
Skewness Detects	3.073	Kurtosis Detects	9.893
Mean of Logged Detects	1.218	SD of Logged Detects	1.205

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.522	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.859	Detected Data Not Normal at 5% Significance Leve	
Lilliefors Test Statistic	0.37	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.243	Detected Data Not Normal at 5% Significance Leve	
Detected Data Not Normal at 5% Significance Leve			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	1.224	KM Standard Error of Mean	0.491
KM SD	4.971	95% KM (BCA) UCL	2.291
95% KM (t) UCL	2.038	95% KM (Percentile Bootstrap) UCL	2.122
95% KM (z) UCL	2.031	95% KM Bootstrap t UCL	5.526
90% KM Chebyshev UCL	2.696	95% KM Chebyshev UCL	3.363
97.5% KM Chebyshev UCL	4.288	99% KM Chebyshev UCL	6.106

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	1.116	Anderson-Darling GOF Test	
5% A-D Critical Value	0.768	Detected Data Not Gamma Distributed at 5% Significance Leve	
K-S Test Statistic	0.324	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.255	Detected Data Not Gamma Distributed at 5% Significance Leve	
Detected Data Not Gamma Distributed at 5% Significance Leve			

Gamma Statistics on Detected Data Only

k hat (MLE)	0.721	k star (bias corrected MLE)	0.596
Theta hat (MLE)	10.81	Theta star (bias corrected MLE)	13.07
nu hat (MLE)	17.3	nu star (bias corrected)	14.31
Mean (detects)	7.793		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.844

APPENDIX B-1B1
OCPs and PCBs in Soil - All Areas Except Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg)

Maximum	51	Median	0.01
SD	5.055	CV	5.99
k hat (MLE)	0.194	k star (bias corrected MLE)	0.195
Theta hat (MLE)	4.35	Theta star (bias corrected MLE)	4.333
nu hat (MLE)	43.45	nu star (bias corrected)	43.62
Adjusted Level of Significance (β)	0.0479		
Approximate Chi Square Value (43.62, α)	29.48	Adjusted Chi Square Value (43.62, β)	29.33
95% Gamma Approximate UCL (use when n>=50)	1.249	95% Gamma Adjusted UCL (use when n<50)	1.255

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	1.224	SD (KM)	4.971
Variance (KM)	24.71	SE of Mean (KM)	0.491
k hat (KM)	0.0606	k star (KM)	0.065
nu hat (KM)	13.58	nu star (KM)	14.55
theta hat (KM)	20.19	theta star (KM)	18.84
80% gamma percentile (KM)	0.366	90% gamma percentile (KM)	2.482
95% gamma percentile (KM)	6.967	99% gamma percentile (KM)	23.85

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (14.55, α)	6.951	Adjusted Chi Square Value (14.55, β)	6.882
95% Gamma Approximate KM-UCL (use when n>=50)	2.563	95% Gamma Adjusted KM-UCL (use when n<50)	2.588

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.894	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.859	Detected Data appear Lognormal at 5% Significance Leve	
Lilliefors Test Statistic	0.239	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.243	Detected Data appear Lognormal at 5% Significance Leve	
Detected Data appear Lognormal at 5% Significance Leve			

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.88	Mean in Log Scale	-4.246
SD in Original Scale	5.05	SD in Log Scale	2.943
95% t UCL (assumes normality of ROS data)	1.672	95% Percentile Bootstrap UCL	1.782
95% BCA Bootstrap UCL	2.366	95% Bootstrap t UCL	3.993
95% H-UCL (Log ROS)	3.855		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distributior

KM Mean (logged)	-0.615	KM Geo Mean	0.541
KM SD (logged)	0.743	95% Critical H Value (KM-Log)	1.999
KM Standard Error of Mean (logged)	0.0739	95% H-UCL (KM -Log)	0.82
KM SD (logged)	0.743	95% Critical H Value (KM-Log)	1.999
KM Standard Error of Mean (logged)	0.0739		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	1.184	Mean in Log Scale	-0.855
SD in Original Scale	5.005	SD in Log Scale	0.966
95% t UCL (Assumes normality)	1.968	95% H-Stat UCL	0.828

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Detected Data appear Lognormal Distributed at 5% Significance Leve

Suggested UCL to Use
KM H-UCL 0.82

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
Recommendations are based upon data size, data distribution, and skewness
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statisticiar

APPENDIX B-1B1
OCPs and PCBs in Soil - All Areas Except Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg)

Heptachlor

General Statistics

Total Number of Observations	112	Number of Distinct Observations	14
Number of Detects	0	Number of Non-Detects	112
Number of Distinct Detects	0	Number of Distinct Non-Detects	14

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV)

The data set for variable S was not processed!

APPENDIX B-1B1
OCPs and PCBs in Soil - All Areas Except Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg)

Heptachlor epoxide

General Statistics

Total Number of Observations	112	Number of Distinct Observations	11
Number of Detects	0	Number of Non-Detects	112
Number of Distinct Detects	0	Number of Distinct Non-Detects	11

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV)

The data set for variable T was not processed!

APPENDIX B-1B1
OCPs and PCBs in Soil - All Areas Except Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg)

Methoxychlor

General Statistics

Total Number of Observations	112	Number of Distinct Observations	10
Number of Detects	0	Number of Non-Detects	112
Number of Distinct Detects	0	Number of Distinct Non-Detects	10

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV)

The data set for variable U was not processed!

APPENDIX B-1B1
OCPs and PCBs in Soil - All Areas Except Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg)

PCB-1016 (Aroclor 1016)

General Statistics

Total Number of Observations	112	Number of Distinct Observations	2
Number of Detects	0	Number of Non-Detects	112
Number of Distinct Detects	0	Number of Distinct Non-Detects	2

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV)

The data set for variable V was not processed!

APPENDIX B-1B1
OCPs and PCBs in Soil - All Areas Except Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg)

PCB-1221 (Aroclor 1221)

General Statistics

Total Number of Observations	112	Number of Distinct Observations	2
Number of Detects	0	Number of Non-Detects	112
Number of Distinct Detects	0	Number of Distinct Non-Detects	2

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV)

The data set for variable W was not processed!

APPENDIX B-1B1
OCPs and PCBs in Soil - All Areas Except Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg)

PCB-1232 (Aroclor 1232)

General Statistics

Total Number of Observations	112	Number of Distinct Observations	2
Number of Detects	0	Number of Non-Detects	112
Number of Distinct Detects	0	Number of Distinct Non-Detects	2

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV)

The data set for variable X was not processed!

APPENDIX B-1B1
OCPs and PCBs in Soil - All Areas Except Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg)

PCB-1242 (Aroclor 1242)

General Statistics

Total Number of Observations	112	Number of Distinct Observations	2
Number of Detects	0	Number of Non-Detects	112
Number of Distinct Detects	0	Number of Distinct Non-Detects	2

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV)

The data set for variable Y was not processed!

APPENDIX B-1B1
OCPs and PCBs in Soil - All Areas Except Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg)

PCB-1248 (Aroclor 1248)

General Statistics

Total Number of Observations	112	Number of Distinct Observations	2
Number of Detects	0	Number of Non-Detects	112
Number of Distinct Detects	0	Number of Distinct Non-Detects	2

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV)

The data set for variable Z was not processed!

APPENDIX B-1B1
OCPs and PCBs in Soil - All Areas Except Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg)

PCB-1254 (Aroclor 1254)

General Statistics

Total Number of Observations	112	Number of Distinct Observations	8
Number of Detects	4	Number of Non-Detects	108
Number of Distinct Detects	4	Number of Distinct Non-Detects	4
Minimum Detect	46	Minimum Non-Detect	16
Maximum Detect	200	Maximum Non-Detect	170
Variance Detects	3971	Percent Non-Detects	96.43%
Mean Detects	124	SD Detects	63.01
Median Detects	125	CV Detects	0.508
Skewness Detects	-0.0944	Kurtosis Detects	1.38
Mean of Logged Detects	4.695	SD of Logged Detects	0.62

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.97	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Normal at 5% Significance Leve	
Lilliefors Test Statistic	0.225	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.375	Detected Data appear Normal at 5% Significance Leve	
Detected Data appear Normal at 5% Significance Leve			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	19.88	KM Standard Error of Mean	2.469
KM SD	22.58	95% KM (BCA) UCL	N/A
95% KM (t) UCL	23.97	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	23.94	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	27.29	95% KM Chebyshev UCL	30.64
97.5% KM Chebyshev UCL	35.3	99% KM Chebyshev UCL	44.44

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.326	Anderson-Darling GOF Test	
5% A-D Critical Value	0.659	Detected data appear Gamma Distributed at 5% Significance Leve	
K-S Test Statistic	0.289	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.396	Detected data appear Gamma Distributed at 5% Significance Leve	
Detected data appear Gamma Distributed at 5% Significance Leve			

Gamma Statistics on Detected Data Only

k hat (MLE)	4.166	k star (bias corrected MLE)	1.208
Theta hat (MLE)	29.76	Theta star (bias corrected MLE)	102.6
nu hat (MLE)	33.33	nu star (bias corrected)	9.666
Mean (detects)	124		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	5.161
Maximum	200	Median	0.01
SD	25.62	CV	4.964
k hat (MLE)	0.138	k star (bias corrected MLE)	0.14
Theta hat (MLE)	37.52	Theta star (bias corrected MLE)	36.91
nu hat (MLE)	30.81	nu star (bias corrected)	31.32
Adjusted Level of Significance (β)	0.0479		
Approximate Chi Square Value (31.32, α)	19.53	Adjusted Chi Square Value (31.32, β)	19.41
95% Gamma Approximate UCL (use when n>=50)	8.275	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	19.88	SD (KM)	22.58
Variance (KM)	510	SE of Mean (KM)	2.469
k hat (KM)	0.775	k star (KM)	0.76
nu hat (KM)	173.6	nu star (KM)	170.3

APPENDIX B-1B1
OCPs and PCBs in Soil - All Areas Except Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg)

theta hat (KM)	25.65	theta star (KM)	26.15
80% gamma percentile (KM)	32.57	90% gamma percentile (KM)	48.94
95% gamma percentile (KM)	65.68	99% gamma percentile (KM)	105.4

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (170.28, α)	141.1	Adjusted Chi Square Value (170.28, β)	140.8
95% Gamma Approximate KM-UCL (use when n>=50)	23.99	95% Gamma Adjusted KM-UCL (use when n<50)	24.05

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.908	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Lognormal at 5% Significance Leve	
Lilliefors Test Statistic	0.309	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.375	Detected Data appear Lognormal at 5% Significance Leve	
Detected Data appear Lognormal at 5% Significance Leve			

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	10.52	Mean in Log Scale	1.057
SD in Original Scale	25.88	SD in Log Scale	1.619
95% t UCL (assumes normality of ROS data)	14.57	95% Percentile Bootstrap UCL	15.09
95% BCA Bootstrap UCL	16.53	95% Bootstrap t UCL	19.11
95% H-UCL (Log ROS)	16.58		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distributior

KM Mean (logged)	2.842	KM Geo Mean	17.15
KM SD (logged)	0.372	95% Critical H Value (KM-Log)	1.768
KM Standard Error of Mean (logged)	0.0407	95% H-UCL (KM -Log)	19.56
KM SD (logged)	0.372	95% Critical H Value (KM-Log)	1.768
KM Standard Error of Mean (logged)	0.0407		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	13.6	Mean in Log Scale	2.265
SD in Original Scale	24.99	SD in Log Scale	0.548
95% t UCL (Assumes normality)	17.52	95% H-Stat UCL	12.34

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Detected Data appear Normal Distributed at 5% Significance Leve

Suggested UCL to Use

95% KM (t) UCL	23.97

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
Recommendations are based upon data size, data distribution, and skewness
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statisticiar

APPENDIX B-1B1
OCPs and PCBs in Soil - All Areas Except Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg)

PCB-1260 (Aroclor 1260)

General Statistics

Total Number of Observations	112	Number of Distinct Observations	41
Number of Detects	46	Number of Non-Detects	66
Number of Distinct Detects	41	Number of Distinct Non-Detects	1
Minimum Detect	17	Minimum Non-Detect	17
Maximum Detect	1500	Maximum Non-Detect	17
Variance Detects	92004	Percent Non-Detects	58.93%
Mean Detects	215.4	SD Detects	303.3
Median Detects	86.5	CV Detects	1.408
Skewness Detects	2.443	Kurtosis Detects	6.749
Mean of Logged Detects	4.604	SD of Logged Detects	1.24

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.679	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.945	Detected Data Not Normal at 5% Significance Leve	
Lilliefors Test Statistic	0.257	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.129	Detected Data Not Normal at 5% Significance Leve	
Detected Data Not Normal at 5% Significance Leve			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	98.47	KM Standard Error of Mean	20.6
KM SD	215.6	95% KM (BCA) UCL	134.1
95% KM (t) UCL	132.6	95% KM (Percentile Bootstrap) UCL	132
95% KM (z) UCL	132.4	95% KM Bootstrap t UCL	146.7
90% KM Chebyshev UCL	160.3	95% KM Chebyshev UCL	188.3
97.5% KM Chebyshev UCL	227.1	99% KM Chebyshev UCL	303.4

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	1.613	Anderson-Darling GOF Test	
5% A-D Critical Value	0.789	Detected Data Not Gamma Distributed at 5% Significance Leve	
K-S Test Statistic	0.162	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.136	Detected Data Not Gamma Distributed at 5% Significance Leve	
Detected Data Not Gamma Distributed at 5% Significance Leve			

Gamma Statistics on Detected Data Only

k hat (MLE)	0.776	k star (bias corrected MLE)	0.739
Theta hat (MLE)	277.7	Theta star (bias corrected MLE)	291.3
nu hat (MLE)	71.35	nu star (bias corrected)	68.03
Mean (detects)	215.4		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	88.46
Maximum	1500	Median	0.01
SD	220.5	CV	2.493
k hat (MLE)	0.146	k star (bias corrected MLE)	0.148
Theta hat (MLE)	608	Theta star (bias corrected MLE)	599.5
nu hat (MLE)	32.59	nu star (bias corrected)	33.05
Adjusted Level of Significance (β)	0.0479		
Approximate Chi Square Value (33.05, α)	20.91	Adjusted Chi Square Value (33.05, β)	20.78
95% Gamma Approximate UCL (use when n>=50)	139.8	95% Gamma Adjusted UCL (use when n<50)	140.7

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	98.47	SD (KM)	215.6
Variance (KM)	46490	SE of Mean (KM)	20.6
k hat (KM)	0.209	k star (KM)	0.209
nu hat (KM)	46.72	nu star (KM)	46.8

APPENDIX B-1B1
OCPs and PCBs in Soil - All Areas Except Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg)

theta hat (KM)	472.1	theta star (KM)	471.3
80% gamma percentile (KM)	132.7	90% gamma percentile (KM)	297.8
95% gamma percentile (KM)	501.6	99% gamma percentile (KM)	1059

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (46.80, α)	32.11	Adjusted Chi Square Value (46.80, β)	31.95
95% Gamma Approximate KM-UCL (use when n>=50)	143.6	95% Gamma Adjusted KM-UCL (use when n<50)	144.3

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.942	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.945	Detected Data Not Lognormal at 5% Significance Leve	
Lilliefors Test Statistic	0.108	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.129	Detected Data appear Lognormal at 5% Significance Leve	

Detected Data appear Approximate Lognormal at 5% Significance Leve

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	91.48	Mean in Log Scale	2.44
SD in Original Scale	219.3	SD in Log Scale	2.262
95% t UCL (assumes normality of ROS data)	125.9	95% Percentile Bootstrap UCL	126.5
95% BCA Bootstrap UCL	135.7	95% Bootstrap t UCL	137.6
95% H-UCL (Log ROS)	324.2		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distributior

KM Mean (logged)	3.56	KM Geo Mean	35.18
KM SD (logged)	1.173	95% Critical H Value (KM-Log)	2.382
KM Standard Error of Mean (logged)	0.112	95% H-UCL (KM -Log)	91.29
KM SD (logged)	1.173	95% Critical H Value (KM-Log)	2.382
KM Standard Error of Mean (logged)	0.112		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	93.46	Mean in Log Scale	3.152
SD in Original Scale	218.5	SD in Log Scale	1.451
95% t UCL (Assumes normality)	127.7	95% H-Stat UCL	96.88

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Detected Data appear Approximate Lognormal Distributed at 5% Significance Leve

Suggested UCL to Use

KM H-UCL	91.29

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
Recommendations are based upon data size, data distribution, and skewness
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statisticiar

APPENDIX B-1B1
OCPs and PCBs in Soil - All Areas Except Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg)

Toxaphene

General Statistics

Total Number of Observations	112	Number of Distinct Observations	12
Number of Detects	0	Number of Non-Detects	112
Number of Distinct Detects	0	Number of Distinct Non-Detects	12

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV)

The data set for variable C was not processed!

APPENDIX B-1B2
OCPs and PCBs in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg)

4,4'-DDD

General Statistics

Total Number of Observations	26	Number of Distinct Observations	12
Number of Detects	3	Number of Non-Detects	23
Number of Distinct Detects	3	Number of Distinct Non-Detects	9
Minimum Detect	1.3	Minimum Non-Detect	0.58
Maximum Detect	4.2	Maximum Non-Detect	12
Variance Detects	2.203	Percent Non-Detects	88.46%
Mean Detects	2.933	SD Detects	1.484
Median Detects	3.3	CV Detects	0.506
Skewness Detects	-1.044	Kurtosis Detects	N/A
Mean of Logged Detects	0.964	SD of Logged Detects	0.619

Warning: Data set has only 3 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.954	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Normal at 5% Significance Leve	
Lilliefors Test Statistic	0.264	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.425	Detected Data appear Normal at 5% Significance Leve	

Detected Data appear Normal at 5% Significance Leve

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.94	KM Standard Error of Mean	0.264
KM SD	0.963	95% KM (BCA) UCL	N/A
95% KM (t) UCL	1.392	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	1.375	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	1.733	95% KM Chebyshev UCL	2.093
97.5% KM Chebyshev UCL	2.592	99% KM Chebyshev UCL	3.571

Gamma GOF Tests on Detected Observations Only
Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	4.611	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.636	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	27.66	nu star (bias corrected)	N/A
Mean (detects)	2.933		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.381
Maximum	4.2	Median	0.01
SD	1.044	CV	2.739
k hat (MLE)	0.251	k star (bias corrected MLE)	0.248
Theta hat (MLE)	1.517	Theta star (bias corrected MLE)	1.537
nu hat (MLE)	13.06	nu star (bias corrected)	12.89
Adjusted Level of Significance (β)	0.0398		
Approximate Chi Square Value (12.89, α)	5.818	Adjusted Chi Square Value (12.89, β)	5.506
95% Gamma Approximate UCL (use when n>=50)	0.844	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.94	SD (KM)	0.963
Variance (KM)	0.926	SE of Mean (KM)	0.264
k hat (KM)	0.954	k star (KM)	0.87
nu hat (KM)	49.61	nu star (KM)	45.22

APPENDIX B-1B2
OCPs and PCBs in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg)

theta hat (KM)	0.985	theta star (KM)	1.081
80% gamma percentile (KM)	1.529	90% gamma percentile (KM)	2.24
95% gamma percentile (KM)	2.96	99% gamma percentile (KM)	4.649

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (45.22, α)	30.8	Adjusted Chi Square Value (45.22, β)	30.01
95% Gamma Approximate KM-UCL (use when n>=50)	1.381	95% Gamma Adjusted KM-UCL (use when n<50)	1.417

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.896	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Lognormal at 5% Significance Leve	
Lilliefors Test Statistic	0.312	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.425	Detected Data appear Lognormal at 5% Significance Leve	
Detected Data appear Lognormal at 5% Significance Leve			

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.552	Mean in Log Scale	-1.47
SD in Original Scale	0.997	SD in Log Scale	1.233
95% t UCL (assumes normality of ROS data)	0.886	95% Percentile Bootstrap UCL	0.897
95% BCA Bootstrap UCL	1.03	95% Bootstrap t UCL	1.535
95% H-UCL (Log ROS)	0.986		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distributior

KM Mean (logged)	-0.31	KM Geo Mean	0.733
KM SD (logged)	0.576	95% Critical H Value (KM-Log)	2.032
KM Standard Error of Mean (logged)	0.159	95% H-UCL (KM -Log)	1.093
KM SD (logged)	0.576	95% Critical H Value (KM-Log)	2.032
KM Standard Error of Mean (logged)	0.159		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	1.461	Mean in Log Scale	-0.135
SD in Original Scale	1.552	SD in Log Scale	1.019
95% t UCL (Assumes normality)	1.981	95% H-Stat UCL	2.459

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Detected Data appear Normal Distributed at 5% Significance Leve

Suggested UCL to Use
95% KM (t) UCL 1.392

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
Recommendations are based upon data size, data distribution, and skewness
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statisticiar

APPENDIX B-1B2
OCPs and PCBs in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg)

4,4'-DDE

General Statistics

Total Number of Observations	26	Number of Distinct Observations	15
Number of Detects	5	Number of Non-Detects	21
Number of Distinct Detects	5	Number of Distinct Non-Detects	10
Minimum Detect	1.8	Minimum Non-Detect	0.4
Maximum Detect	4.5	Maximum Non-Detect	8.3
Variance Detects	1.107	Percent Non-Detects	80.77%
Mean Detects	2.92	SD Detects	1.052
Median Detects	2.8	CV Detects	0.36
Skewness Detects	0.794	Kurtosis Detects	0.258
Mean of Logged Detects	1.021	SD of Logged Detects	0.355

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.958	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.762	Detected Data appear Normal at 5% Significance Leve	
Lilliefors Test Statistic	0.159	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.343	Detected Data appear Normal at 5% Significance Leve	
Detected Data appear Normal at 5% Significance Leve			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.993	KM Standard Error of Mean	0.274
KM SD	1.14	95% KM (BCA) UCL	1.472
95% KM (t) UCL	1.462	95% KM (Percentile Bootstrap) UCL	1.444
95% KM (z) UCL	1.445	95% KM Bootstrap t UCL	1.223
90% KM Chebyshev UCL	1.817	95% KM Chebyshev UCL	2.19
97.5% KM Chebyshev UCL	2.707	99% KM Chebyshev UCL	3.724

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.187	Anderson-Darling GOF Test	
5% A-D Critical Value	0.679	Detected data appear Gamma Distributed at 5% Significance Leve	
K-S Test Statistic	0.173	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.358	Detected data appear Gamma Distributed at 5% Significance Leve	
Detected data appear Gamma Distributed at 5% Significance Leve			

Gamma Statistics on Detected Data Only

k hat (MLE)	10	k star (bias corrected MLE)	4.135
Theta hat (MLE)	0.292	Theta star (bias corrected MLE)	0.706
nu hat (MLE)	100	nu star (bias corrected)	41.35
Mean (detects)	2.92		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.829
Maximum	4.5	Median	0.429
SD	1.196	CV	1.442
k hat (MLE)	0.375	k star (bias corrected MLE)	0.357
Theta hat (MLE)	2.213	Theta star (bias corrected MLE)	2.322
nu hat (MLE)	19.49	nu star (bias corrected)	18.57
Adjusted Level of Significance (β)	0.0398		
Approximate Chi Square Value (18.57, α)	9.807	Adjusted Chi Square Value (18.57, β)	9.387
95% Gamma Approximate UCL (use when n>=50)	1.571	95% Gamma Adjusted UCL (use when n<50)	1.641

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.993	SD (KM)	1.14
Variance (KM)	1.299	SE of Mean (KM)	0.274
k hat (KM)	0.76	k star (KM)	0.698
nu hat (KM)	39.51	nu star (KM)	36.29

APPENDIX B-1B2
OCPs and PCBs in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg)

theta hat (KM)	1.307	theta star (KM)	1.424
80% gamma percentile (KM)	1.633	90% gamma percentile (KM)	2.496
95% gamma percentile (KM)	3.385	99% gamma percentile (KM)	5.51

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (36.29, α)	23.5	Adjusted Chi Square Value (36.29, β)	22.82
95% Gamma Approximate KM-UCL (use when n>=50)	1.534	95% Gamma Adjusted KM-UCL (use when n<50)	1.58

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.989	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.762	Detected Data appear Lognormal at 5% Significance Leve	
Lilliefors Test Statistic	0.143	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.343	Detected Data appear Lognormal at 5% Significance Leve	
Detected Data appear Lognormal at 5% Significance Leve			

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	1.337	Mean in Log Scale	0.121
SD in Original Scale	0.939	SD in Log Scale	0.555
95% t UCL (assumes normality of ROS data)	1.651	95% Percentile Bootstrap UCL	1.665
95% BCA Bootstrap UCL	1.728	95% Bootstrap t UCL	1.825
95% H-UCL (Log ROS)	1.647		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distributior

KM Mean (logged)	-0.452	KM Geo Mean	0.636
KM SD (logged)	0.835	95% Critical H Value (KM-Log)	2.305
KM Standard Error of Mean (logged)	0.205	95% H-UCL (KM -Log)	1.324
KM SD (logged)	0.835	95% Critical H Value (KM-Log)	2.305
KM Standard Error of Mean (logged)	0.205		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	1.316	Mean in Log Scale	-0.294
SD in Original Scale	1.308	SD in Log Scale	1.139
95% t UCL (Assumes normality)	1.754	95% H-Stat UCL	2.636

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Detected Data appear Normal Distributed at 5% Significance Leve

Suggested UCL to Use

95% KM (t) UCL	1.462

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
Recommendations are based upon data size, data distribution, and skewness
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statisticiar

APPENDIX B-1B2
OCPs and PCBs in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg)

4,4'-DDT

General Statistics

Total Number of Observations	26	Number of Distinct Observations	14
Number of Detects	4	Number of Non-Detects	22
Number of Distinct Detects	4	Number of Distinct Non-Detects	10
Minimum Detect	0.88	Minimum Non-Detect	0.39
Maximum Detect	14	Maximum Non-Detect	8.1
Variance Detects	32.56	Percent Non-Detects	84.62%
Mean Detects	5.845	SD Detects	5.706
Median Detects	4.25	CV Detects	0.976
Skewness Detects	1.453	Kurtosis Detects	2.427
Mean of Logged Detects	1.341	SD of Logged Detects	1.146

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.886	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Normal at 5% Significance Leve	
Lilliefors Test Statistic	0.302	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.375	Detected Data appear Normal at 5% Significance Leve	
Detected Data appear Normal at 5% Significance Leve			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	1.287	KM Standard Error of Mean	0.635
KM SD	2.773	95% KM (BCA) UCL	N/A
95% KM (t) UCL	2.372	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	2.332	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	3.193	95% KM Chebyshev UCL	4.056
97.5% KM Chebyshev UCL	5.254	99% KM Chebyshev UCL	7.608

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.219	Anderson-Darling GOF Test	
5% A-D Critical Value	0.664	Detected data appear Gamma Distributed at 5% Significance Leve	
K-S Test Statistic	0.193	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.401	Detected data appear Gamma Distributed at 5% Significance Leve	
Detected data appear Gamma Distributed at 5% Significance Leve			

Gamma Statistics on Detected Data Only

k hat (MLE)	1.32	k star (bias corrected MLE)	0.497
Theta hat (MLE)	4.429	Theta star (bias corrected MLE)	11.77
nu hat (MLE)	10.56	nu star (bias corrected)	3.972
Mean (detects)	5.845		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.908
Maximum	14	Median	0.01
SD	2.918	CV	3.215
k hat (MLE)	0.204	k star (bias corrected MLE)	0.206
Theta hat (MLE)	4.446	Theta star (bias corrected MLE)	4.401
nu hat (MLE)	10.62	nu star (bias corrected)	10.72
Adjusted Level of Significance (β)	0.0398		
Approximate Chi Square Value (10.72, α)	4.399	Adjusted Chi Square Value (10.72, β)	4.134
95% Gamma Approximate UCL (use when n>=50)	2.213	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	1.287	SD (KM)	2.773
Variance (KM)	7.688	SE of Mean (KM)	0.635
k hat (KM)	0.215	k star (KM)	0.216
nu hat (KM)	11.2	nu star (KM)	11.24

APPENDIX B-1B2
OCPs and PCBs in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg)

theta hat (KM)	5.975	theta star (KM)	5.953
80% gamma percentile (KM)	1.762	90% gamma percentile (KM)	3.889
95% gamma percentile (KM)	6.494	99% gamma percentile (KM)	13.58

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (11.24, α)	4.731	Adjusted Chi Square Value (11.24, β)	4.454
95% Gamma Approximate KM-UCL (use when n>=50)	3.057	95% Gamma Adjusted KM-UCL (use when n<50)	3.247

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.985	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Lognormal at 5% Significance Leve	
Lilliefors Test Statistic	0.209	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.375	Detected Data appear Lognormal at 5% Significance Leve	
Detected Data appear Lognormal at 5% Significance Leve			

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	1.002	Mean in Log Scale	-2.065
SD in Original Scale	2.891	SD in Log Scale	1.87
95% t UCL (assumes normality of ROS data)	1.97	95% Percentile Bootstrap UCL	2.037
95% BCA Bootstrap UCL	2.762	95% Bootstrap t UCL	4.514
95% H-UCL (Log ROS)	3.015		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distributior

KM Mean (logged)	-0.539	KM Geo Mean	0.583
KM SD (logged)	0.937	95% Critical H Value (KM-Log)	2.427
KM Standard Error of Mean (logged)	0.224	95% H-UCL (KM -Log)	1.425
KM SD (logged)	0.937	95% Critical H Value (KM-Log)	2.427
KM Standard Error of Mean (logged)	0.224		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	1.651	Mean in Log Scale	-0.365
SD in Original Scale	2.847	SD in Log Scale	1.277
95% t UCL (Assumes normality)	2.605	95% H-Stat UCL	3.282

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Detected Data appear Normal Distributed at 5% Significance Leve

Suggested UCL to Use

95% KM (t) UCL	2.372

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
Recommendations are based upon data size, data distribution, and skewness
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statisticiar

APPENDIX B-1B2
OCPs and PCBs in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg)

Aldrin

General Statistics

Total Number of Observations	26	Number of Distinct Observations	12
Number of Detects	0	Number of Non-Detects	26
Number of Distinct Detects	0	Number of Distinct Non-Detects	12

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV)

The data set for variable D was not processed!

APPENDIX B-1B2
OCPs and PCBs in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg)

alpha-BHC

General Statistics

Total Number of Observations	26	Number of Distinct Observations	10
Number of Detects	0	Number of Non-Detects	26
Number of Distinct Detects	0	Number of Distinct Non-Detects	10

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV)

The data set for variable E was not processed!

APPENDIX B-1B2
OCPs and PCBs in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg)

alpha-Chlordane

General Statistics

Total Number of Observations	26	Number of Distinct Observations	14
Number of Detects	3	Number of Non-Detects	23
Number of Distinct Detects	3	Number of Distinct Non-Detects	11
Minimum Detect	1.2	Minimum Non-Detect	0.38
Maximum Detect	4.5	Maximum Non-Detect	7.9
Variance Detects	2.91	Percent Non-Detects	88.46%
Mean Detects	2.6	SD Detects	1.706
Median Detects	2.1	CV Detects	0.656
Skewness Detects	1.206	Kurtosis Detects	N/A
Mean of Logged Detects	0.809	SD of Logged Detects	0.663

Warning: Data set has only 3 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.936	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Normal at 5% Significance Leve	
Lilliefors Test Statistic	0.282	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.425	Detected Data appear Normal at 5% Significance Leve	

Detected Data appear Normal at 5% Significance Leve

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.681	KM Standard Error of Mean	0.224
KM SD	0.882	95% KM (BCA) UCL	N/A
95% KM (t) UCL	1.063	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	1.049	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	1.352	95% KM Chebyshev UCL	1.656
97.5% KM Chebyshev UCL	2.078	99% KM Chebyshev UCL	2.906

Gamma GOF Tests on Detected Observations Only
Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	3.581	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.726	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	21.49	nu star (bias corrected)	N/A
Mean (detects)	2.6		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.309
Maximum	4.5	Median	0.01
SD	0.972	CV	3.147
k hat (MLE)	0.253	k star (bias corrected MLE)	0.249
Theta hat (MLE)	1.222	Theta star (bias corrected MLE)	1.239
nu hat (MLE)	13.14	nu star (bias corrected)	12.96
Adjusted Level of Significance (β)	0.0398		
Approximate Chi Square Value (12.96, α)	5.865	Adjusted Chi Square Value (12.96, β)	5.552
95% Gamma Approximate UCL (use when n>=50)	0.682	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.681	SD (KM)	0.882
Variance (KM)	0.778	SE of Mean (KM)	0.224
k hat (KM)	0.597	k star (KM)	0.553
nu hat (KM)	31.02	nu star (KM)	28.77

APPENDIX B-1B2
OCPs and PCBs in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg)

theta hat (KM)	1.142	theta star (KM)	1.231
80% gamma percentile (KM)	1.123	90% gamma percentile (KM)	1.804
95% gamma percentile (KM)	2.524	99% gamma percentile (KM)	4.279

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (28.77, α)	17.53	Adjusted Chi Square Value (28.77, β)	16.95
95% Gamma Approximate KM-UCL (use when n>=50)	1.118	95% Gamma Adjusted KM-UCL (use when n<50)	1.157

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.992	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Lognormal at 5% Significance Leve	
Lilliefors Test Statistic	0.207	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.425	Detected Data appear Lognormal at 5% Significance Leve	
Detected Data appear Lognormal at 5% Significance Leve			

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.491	Mean in Log Scale	-1.482
SD in Original Scale	0.927	SD in Log Scale	1.109
95% t UCL (assumes normality of ROS data)	0.801	95% Percentile Bootstrap UCL	0.807
95% BCA Bootstrap UCL	0.975	95% Bootstrap t UCL	1.461
95% H-UCL (Log ROS)	0.757		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distributior

KM Mean (logged)	-0.713	KM Geo Mean	0.49
KM SD (logged)	0.638	95% Critical H Value (KM-Log)	2.091
KM Standard Error of Mean (logged)	0.17	95% H-UCL (KM -Log)	0.785
KM SD (logged)	0.638	95% Critical H Value (KM-Log)	2.091
KM Standard Error of Mean (logged)	0.17		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	1.078	Mean in Log Scale	-0.5
SD in Original Scale	1.177	SD in Log Scale	1.111
95% t UCL (Assumes normality)	1.473	95% H-Stat UCL	2.029

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Detected Data appear Normal Distributed at 5% Significance Leve

Suggested UCL to Use
95% KM (t) UCL 1.063

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
Recommendations are based upon data size, data distribution, and skewness
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statisticiar

APPENDIX B-1B2
OCPs and PCBs in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg)

beta-BHC

General Statistics

Total Number of Observations	26	Number of Distinct Observations	10
Number of Detects	0	Number of Non-Detects	26
Number of Distinct Detects	0	Number of Distinct Non-Detects	10

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV)

The data set for variable G was not processed!

APPENDIX B-1B2
OCPs and PCBs in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg)

Chlordane

General Statistics

Total Number of Observations	26	Number of Distinct Observations	15
Number of Detects	1	Number of Non-Detects	25
Number of Distinct Detects	1	Number of Distinct Non-Detects	14

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set
It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV)

The data set for variable H was not processed!

APPENDIX B-1B2
OCPs and PCBs in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg)

delta-BHC

General Statistics

Total Number of Observations	26	Number of Distinct Observations	11
Number of Detects	0	Number of Non-Detects	26
Number of Distinct Detects	0	Number of Distinct Non-Detects	11

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV)

The data set for variable I was not processed!

APPENDIX B-1B2
OCPs and PCBs in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg)

Dieldrin

General Statistics

Total Number of Observations	26	Number of Distinct Observations	10
Number of Detects	1	Number of Non-Detects	25
Number of Distinct Detects	1	Number of Distinct Non-Detects	9

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set
It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV)

The data set for variable J was not processed!

APPENDIX B-1B2
OCPs and PCBs in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg)

Endosulfan I

General Statistics

Total Number of Observations	26	Number of Distinct Observations	10
Number of Detects	0	Number of Non-Detects	26
Number of Distinct Detects	0	Number of Distinct Non-Detects	10

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV)

The data set for variable K was not processed!

APPENDIX B-1B2
OCPs and PCBs in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg)

Endosulfan II

General Statistics

Total Number of Observations	26	Number of Distinct Observations	11
Number of Detects	0	Number of Non-Detects	26
Number of Distinct Detects	0	Number of Distinct Non-Detects	11

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV)

The data set for variable L was not processed!

APPENDIX B-1B2
OCPs and PCBs in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg)

Endosulfan sulfate

General Statistics

Total Number of Observations	25	Number of Distinct Observations	11
Number of Detects	0	Number of Non-Detects	25
Number of Distinct Detects	0	Number of Distinct Non-Detects	11

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV)

The data set for variable M was not processed!

APPENDIX B-1B2
OCPs and PCBs in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg)

Endrin

General Statistics

Total Number of Observations	26	Number of Distinct Observations	11
Number of Detects	0	Number of Non-Detects	26
Number of Distinct Detects	0	Number of Distinct Non-Detects	11

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV)

The data set for variable N was not processed!

APPENDIX B-1B2
OCPs and PCBs in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg)

Endrin aldehyde

General Statistics

Total Number of Observations	26	Number of Distinct Observations	8
Number of Detects	0	Number of Non-Detects	26
Number of Distinct Detects	0	Number of Distinct Non-Detects	8

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV)

The data set for variable O was not processed!

APPENDIX B-1B2
OCPs and PCBs in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg)

Endrin ketone

General Statistics			
Total Number of Observations	26	Number of Distinct Observations	11
Number of Detects	1	Number of Non-Detects	25
Number of Distinct Detects	1	Number of Distinct Non-Detects	10

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set
It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV)

The data set for variable P was not processed!

gamma-BHC (Lindane)

General Statistics			
Total Number of Observations	26	Number of Distinct Observations	8
Number of Detects	0	Number of Non-Detects	26
Number of Distinct Detects	0	Number of Distinct Non-Detects	8

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV)

The data set for variable Q was not processed!

APPENDIX B-1B2
OCPs and PCBs in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg)

gamma-Chlordane

General Statistics

Total Number of Observations	26	Number of Distinct Observations	11
Number of Detects	2	Number of Non-Detects	24
Number of Distinct Detects	2	Number of Distinct Non-Detects	10
Minimum Detect	2.4	Minimum Non-Detect	0.44
Maximum Detect	4.5	Maximum Non-Detect	9.1
Variance Detects	2.205	Percent Non-Detects	92.31%
Mean Detects	3.45	SD Detects	1.485
Median Detects	3.45	CV Detects	0.43
Skewness Detects	N/A	Kurtosis Detects	N/A
Mean of Logged Detects	1.19	SD of Logged Detects	0.444

Warning: Data set has only 2 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates

Normal GOF Test on Detects Only
Not Enough Data to Perform GOF Test

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.708	KM Standard Error of Mean	0.266
KM SD	0.899	95% KM (BCA) UCL	N/A
95% KM (t) UCL	1.162	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	1.145	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	1.505	95% KM Chebyshev UCL	1.866
97.5% KM Chebyshev UCL	2.368	99% KM Chebyshev UCL	3.352

Gamma GOF Tests on Detected Observations Only
Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	10.45	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.33	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	41.81	nu star (bias corrected)	N/A
Mean (detects)	3.45		

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.708	SD (KM)	0.899
Variance (KM)	0.809	SE of Mean (KM)	0.266
k hat (KM)	0.62	k star (KM)	0.574
nu hat (KM)	32.23	nu star (KM)	29.85
theta hat (KM)	1.142	theta star (KM)	1.234
80% gamma percentile (KM)	1.167	90% gamma percentile (KM)	1.86
95% gamma percentile (KM)	2.589	99% gamma percentile (KM)	4.359

Gamma Kaplan-Meier (KM) Statistics

		Adjusted Level of Significance (β)	0.0398
Approximate Chi Square Value (29.85, α)	18.37	Adjusted Chi Square Value (29.85, β)	17.78
95% Gamma Approximate KM-UCL (use when n>=50)	1.15	95% Gamma Adjusted KM-UCL (use when n<50)	1.189

Lognormal GOF Test on Detected Observations Only
Not Enough Data to Perform GOF Test

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.663	Mean in Log Scale	-0.838
SD in Original Scale	0.906	SD in Log Scale	0.835
95% t UCL (assumes normality of ROS data)	0.966	95% Percentile Bootstrap UCL	0.98
95% BCA Bootstrap UCL	1.076	95% Bootstrap t UCL	1.62
95% H-UCL (Log ROS)	0.901		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distributior

APPENDIX B-1B2

OCPs and PCBs in Soil - Zone 4

Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg)

KM Mean (logged)	-0.639	KM Geo Mean	0.528
KM SD (logged)	0.581	95% Critical H Value (KM-Log)	2.037
KM Standard Error of Mean (logged)	0.175	95% H-UCL (KM -Log)	0.792
KM SD (logged)	0.581	95% Critical H Value (KM-Log)	2.037
KM Standard Error of Mean (logged)	0.175		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	1.133	Mean in Log Scale	-0.457
SD in Original Scale	1.297	SD in Log Scale	1.078
95% t UCL (Assumes normality)	1.568	95% H-Stat UCL	1.989

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution at 5% Significance Leve

Suggested UCL to Use

95% KM (t) UCL	1.162	KM H-UCL	0.792
95% KM (BCA) UCL	N/A		

Warning: One or more Recommended UCL(s) not available!

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
Recommendations are based upon data size, data distribution, and skewness
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statisticiar

APPENDIX B-1B2
OCPs and PCBs in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg)

Heptachlor

General Statistics

Total Number of Observations	26	Number of Distinct Observations	11
Number of Detects	0	Number of Non-Detects	26
Number of Distinct Detects	0	Number of Distinct Non-Detects	11

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV)

The data set for variable S was not processed!

APPENDIX B-1B2
OCPs and PCBs in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg)

Heptachlor epoxide

General Statistics

Total Number of Observations	26	Number of Distinct Observations	10
Number of Detects	0	Number of Non-Detects	26
Number of Distinct Detects	0	Number of Distinct Non-Detects	10

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV)

The data set for variable T was not processed!

APPENDIX B-1B2
OCPs and PCBs in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg)

Methoxychlor

General Statistics

Total Number of Observations	26	Number of Distinct Observations	8
Number of Detects	0	Number of Non-Detects	26
Number of Distinct Detects	0	Number of Distinct Non-Detects	8

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV)

The data set for variable U was not processed!

APPENDIX B-1B2
OCPs and PCBs in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg)

PCB-1016 (Aroclor 1016)

General Statistics

Total Number of Observations	26	Number of Distinct Observations	2
Number of Detects	0	Number of Non-Detects	26
Number of Distinct Detects	0	Number of Distinct Non-Detects	2

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV)

The data set for variable V was not processed!

APPENDIX B-1B2
OCPs and PCBs in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg)

PCB-1221 (Aroclor 1221)

General Statistics

Total Number of Observations	26	Number of Distinct Observations	2
Number of Detects	0	Number of Non-Detects	26
Number of Distinct Detects	0	Number of Distinct Non-Detects	2

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV)

The data set for variable W was not processed!

APPENDIX B-1B2
OCPs and PCBs in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg)

PCB-1232 (Aroclor 1232)

General Statistics

Total Number of Observations	26	Number of Distinct Observations	2
Number of Detects	0	Number of Non-Detects	26
Number of Distinct Detects	0	Number of Distinct Non-Detects	2

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV)

The data set for variable X was not processed!

APPENDIX B-1B2
OCPs and PCBs in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg)

PCB-1242 (Aroclor 1242)

General Statistics

Total Number of Observations	26	Number of Distinct Observations	2
Number of Detects	0	Number of Non-Detects	26
Number of Distinct Detects	0	Number of Distinct Non-Detects	2

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV)

The data set for variable Y was not processed!

APPENDIX B-1B2
OCPs and PCBs in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg)

PCB-1248 (Aroclor 1248)

General Statistics

Total Number of Observations	26	Number of Distinct Observations	2
Number of Detects	0	Number of Non-Detects	26
Number of Distinct Detects	0	Number of Distinct Non-Detects	2

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV)

The data set for variable Z was not processed!

APPENDIX B-1B2
OCPs and PCBs in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg)

PCB-1254 (Aroclor 1254)

General Statistics

Total Number of Observations	26	Number of Distinct Observations	2
Number of Detects	0	Number of Non-Detects	26
Number of Distinct Detects	0	Number of Distinct Non-Detects	2

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV)

The data set for variable A was not processed!

APPENDIX B-1B2
OCPs and PCBs in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg)

PCB-1260 (Aroclor 1260)

General Statistics

Total Number of Observations	26	Number of Distinct Observations	5
Number of Detects	3	Number of Non-Detects	23
Number of Distinct Detects	3	Number of Distinct Non-Detects	2
Minimum Detect	22	Minimum Non-Detect	17
Maximum Detect	41	Maximum Non-Detect	34
Variance Detects	94.33	Percent Non-Detects	88.46%
Mean Detects	30.33	SD Detects	9.713
Median Detects	28	CV Detects	0.32
Skewness Detects	1.019	Kurtosis Detects	N/A
Mean of Logged Detects	3.379	SD of Logged Detects	0.314

Warning: Data set has only 3 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.957	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Normal at 5% Significance Leve	
Lilliefors Test Statistic	0.262	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.425	Detected Data appear Normal at 5% Significance Leve	

Detected Data appear Normal at 5% Significance Leve

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	18.56	KM Standard Error of Mean	1.22
KM SD	5.055	95% KM (BCA) UCL	N/A
95% KM (t) UCL	20.65	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	20.57	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	22.22	95% KM Chebyshev UCL	23.88
97.5% KM Chebyshev UCL	26.18	99% KM Chebyshev UCL	30.7

Gamma GOF Tests on Detected Observations Only
Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	15.18	k star (bias corrected MLE)	N/A
Theta hat (MLE)	1.999	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	91.06	nu star (bias corrected)	N/A
Mean (detects)	30.33		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	5.389
Maximum	41	Median	0.01
SD	10.42	CV	1.934
k hat (MLE)	0.192	k star (bias corrected MLE)	0.195
Theta hat (MLE)	28.13	Theta star (bias corrected MLE)	27.62
nu hat (MLE)	9.962	nu star (bias corrected)	10.15
Adjusted Level of Significance (β)	0.0398		
Approximate Chi Square Value (10.15, α)	4.033	Adjusted Chi Square Value (10.15, β)	3.781
95% Gamma Approximate UCL (use when n>=50)	13.56	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	18.56	SD (KM)	5.055
Variance (KM)	25.56	SE of Mean (KM)	1.22
k hat (KM)	13.48	k star (KM)	11.95
nu hat (KM)	701.2	nu star (KM)	621.6

APPENDIX B-1B2
OCPs and PCBs in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg)

theta hat (KM)	1.377	theta star (KM)	1.553
80% gamma percentile (KM)	22.87	90% gamma percentile (KM)	25.69
95% gamma percentile (KM)	28.19	99% gamma percentile (KM)	33.28

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (621.63, α)	564.8	Adjusted Chi Square Value (621.63, β)	561.2
95% Gamma Approximate KM-UCL (use when n>=50)	20.43	95% Gamma Adjusted KM-UCL (use when n<50)	20.56

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.983	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Lognormal at 5% Significance Leve	
Lilliefors Test Statistic	0.226	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.425	Detected Data appear Lognormal at 5% Significance Leve	
Detected Data appear Lognormal at 5% Significance Leve			

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	10.45	Mean in Log Scale	2.073
SD in Original Scale	8.812	SD in Log Scale	0.744
95% t UCL (assumes normality of ROS data)	13.4	95% Percentile Bootstrap UCL	13.23
95% BCA Bootstrap UCL	13.86	95% Bootstrap t UCL	15
95% H-UCL (Log ROS)	14.56		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distributior

KM Mean (logged)	2.897	KM Geo Mean	18.13
KM SD (logged)	0.196	95% Critical H Value (KM-Log)	1.756
KM Standard Error of Mean (logged)	0.0473	95% H-UCL (KM -Log)	19.79
KM SD (logged)	0.196	95% Critical H Value (KM-Log)	1.756
KM Standard Error of Mean (logged)	0.0473		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	11.35	Mean in Log Scale	2.31
SD in Original Scale	7.695	SD in Log Scale	0.426
95% t UCL (Assumes normality)	13.92	95% H-Stat UCL	12.97
DL/2 is not a recommended method, provided for comparisons and historical reasons			

Nonparametric Distribution Free UCL Statistics
Detected Data appear Normal Distributed at 5% Significance Leve

Suggested UCL to Use

95% KM (t) UCL	20.65

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
Recommendations are based upon data size, data distribution, and skewness
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statisticiar

APPENDIX B-1B2
OCPs and PCBs in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg)

Toxaphene

General Statistics

Total Number of Observations	26	Number of Distinct Observations	9
Number of Detects	0	Number of Non-Detects	26
Number of Distinct Detects	0	Number of Distinct Non-Detects	9

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV)

The data set for variable C was not processed!

APPENDIX B-1C1

PAHs in Soil - All Areas Except Zone 4

Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH diesel and motor oil in milligrams per kilogram (mg/kg)

2-Methylnaphthalene

General Statistics			
Total Number of Observations	112	Number of Distinct Observations	74
Number of Detects	74	Number of Non-Detects	38
Number of Distinct Detects	57	Number of Distinct Non-Detects	23
Minimum Detect	5.1	Minimum Non-Detect	3.9
Maximum Detect	3300	Maximum Non-Detect	490
Variance Detects	240143	Percent Non-Detects	33.93%
Mean Detects	162.5	SD Detects	490
Median Detects	33.5	CV Detects	3.016
Skewness Detects	4.975	Kurtosis Detects	26.73
Mean of Logged Detects	3.645	SD of Logged Detects	1.437

Normal GOF Test on Detects Only			
Shapiro Wilk Test Statistic	0.347	Normal GOF Test on Detected Observations Only	
5% Shapiro Wilk P Value	0	Detected Data Not Normal at 5% Significance Leve	
Lilliefors Test Statistic	0.386	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.103	Detected Data Not Normal at 5% Significance Leve	
Detected Data Not Normal at 5% Significance Leve			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
KM Mean	111.5	KM Standard Error of Mean	38.28
KM SD	402.2	95% KM (BCA) UCL	177.6
95% KM (t) UCL	175	95% KM (Percentile Bootstrap) UCL	183.8
95% KM (z) UCL	174.5	95% KM Bootstrap t UCL	256.8
90% KM Chebyshev UCL	226.3	95% KM Chebyshev UCL	278.4
97.5% KM Chebyshev UCL	350.6	99% KM Chebyshev UCL	492.4

Gamma GOF Tests on Detected Observations Only			
A-D Test Statistic	7.008	Anderson-Darling GOF Test	
5% A-D Critical Value	0.83	Detected Data Not Gamma Distributed at 5% Significance Leve	
K-S Test Statistic	0.261	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.111	Detected Data Not Gamma Distributed at 5% Significance Leve	
Detected Data Not Gamma Distributed at 5% Significance Leve			

Gamma Statistics on Detected Data Only			
k hat (MLE)	0.447	k star (bias corrected MLE)	0.438
Theta hat (MLE)	363.5	Theta star (bias corrected MLE)	371
nu hat (MLE)	66.16	nu star (bias corrected)	64.82
Mean (detects)	162.5		

Gamma ROS Statistics using Imputed Non-Detects			
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs			
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20			
For such situations, GROS method may yield incorrect values of UCLs and BTVs			
This is especially true when the sample size is small.			
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates			
Minimum	0.01	Mean	107.4
Maximum	3300	Median	13
SD	404.8	CV	3.771
k hat (MLE)	0.195	k star (bias corrected MLE)	0.196
Theta hat (MLE)	550.7	Theta star (bias corrected MLE)	548.6
nu hat (MLE)	43.68	nu star (bias corrected)	43.84
Adjusted Level of Significance (β)	0.0479		
Approximate Chi Square Value (43.84, α)	29.66	Adjusted Chi Square Value (43.84, β)	29.5
95% Gamma Approximate UCL (use when n>=50)	158.7	95% Gamma Adjusted UCL (use when n<50)	159.5

Estimates of Gamma Parameters using KM Estimates			
Mean (KM)	111.5	SD (KM)	402.2
Variance (KM)	161750	SE of Mean (KM)	38.28
k hat (KM)	0.0769	k star (KM)	0.0808
nu hat (KM)	17.22	nu star (KM)	18.09

APPENDIX B-1C1

PAHs in Soil - All Areas Except Zone 4

Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH diesel and motor oil in milligrams per kilogram (mg/kg)

theta hat (KM)	1451	theta star (KM)	1381
80% gamma percentile (KM)	54.06	90% gamma percentile (KM)	266
95% gamma percentile (KM)	648.7	99% gamma percentile (KM)	1966

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (18.09, α)	9.457	Adjusted Chi Square Value (18.09, β)	9.376
95% Gamma Approximate KM-UCL (use when n>=50)	213.3	95% Gamma Adjusted KM-UCL (use when n<50)	215.2

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Approximate Test Statistic	0.924	Shapiro Wilk GOF Test	
5% Shapiro Wilk P Value	1.57E-04	Detected Data Not Lognormal at 5% Significance Leve	
Lilliefors Test Statistic	0.1	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.103	Detected Data appear Lognormal at 5% Significance Leve	

Detected Data appear Approximate Lognormal at 5% Significance Leve

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	109.6	Mean in Log Scale	2.888
SD in Original Scale	404.3	SD in Log Scale	1.689
95% t UCL (assumes normality of ROS data)	173	95% Percentile Bootstrap UCL	176.2
95% BCA Bootstrap UCL	208.5	95% Bootstrap t UCL	246
95% H-UCL (Log ROS)	120		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distributior

KM Mean (logged)	3.062	KM Geo Mean	21.37
KM SD (logged)	1.507	95% Critical H Value (KM-Log)	2.738
KM Standard Error of Mean (logged)	0.149	95% H-UCL (KM -Log)	98.33
KM SD (logged)	1.507	95% Critical H Value (KM-Log)	2.738
KM Standard Error of Mean (logged)	0.149		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	117.7	Mean in Log Scale	3.192
SD in Original Scale	403.4	SD in Log Scale	1.585
95% t UCL (Assumes normality)	180.9	95% H-Stat UCL	130.7

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Approximate Lognormal Distributed at 5% Significance Leve

Suggested UCL to Use

KM H-UCL	98.33

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
Recommendations are based upon data size, data distribution, and skewness
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statisticiar

APPENDIX B-1C1

PAHs in Soil - All Areas Except Zone 4

Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH diesel and motor oil in milligrams per kilogram (mg/kg)

Acenaphthene

General Statistics			
Total Number of Observations	112	Number of Distinct Observations	45
Number of Detects	32	Number of Non-Detects	80
Number of Distinct Detects	25	Number of Distinct Non-Detects	24
Minimum Detect	2.8	Minimum Non-Detect	2.6
Maximum Detect	1000	Maximum Non-Detect	280
Variance Detects	35918	Percent Non-Detects	71.43%
Mean Detects	73.21	SD Detects	189.5
Median Detects	15	CV Detects	2.589
Skewness Detects	4.235	Kurtosis Detects	19.59
Mean of Logged Detects	2.691	SD of Logged Detects	1.655

Normal GOF Test on Detects Only			
Shapiro Wilk Test Statistic	0.419	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.93	Detected Data Not Normal at 5% Significance Leve	
Lilliefors Test Statistic	0.365	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.154	Detected Data Not Normal at 5% Significance Leve	
Detected Data Not Normal at 5% Significance Leve			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
KM Mean	23.5	KM Standard Error of Mean	10.06
KM SD	104.7	95% KM (BCA) UCL	43.24
95% KM (t) UCL	40.2	95% KM (Percentile Bootstrap) UCL	41.36
95% KM (z) UCL	40.06	95% KM Bootstrap t UCL	75.19
90% KM Chebyshev UCL	53.69	95% KM Chebyshev UCL	67.37
97.5% KM Chebyshev UCL	86.35	99% KM Chebyshev UCL	123.6

Gamma GOF Tests on Detected Observations Only			
A-D Test Statistic	2.897	Anderson-Darling GOF Test	
5% A-D Critical Value	0.831	Detected Data Not Gamma Distributed at 5% Significance Leve	
K-S Test Statistic	0.226	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.166	Detected Data Not Gamma Distributed at 5% Significance Leve	
Detected Data Not Gamma Distributed at 5% Significance Leve			

Gamma Statistics on Detected Data Only			
k hat (MLE)	0.409	k star (bias corrected MLE)	0.392
Theta hat (MLE)	179	Theta star (bias corrected MLE)	187
nu hat (MLE)	26.18	nu star (bias corrected)	25.06
Mean (detects)	73.21		

Gamma ROS Statistics using Imputed Non-Detects			
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs			
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20			
For such situations, GROS method may yield incorrect values of UCLs and BTVs			
This is especially true when the sample size is small.			
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates			
Minimum	0.01	Mean	21
Maximum	1000	Median	0.01
SD	105.5	CV	5.024
k hat (MLE)	0.141	k star (bias corrected MLE)	0.143
Theta hat (MLE)	149.1	Theta star (bias corrected MLE)	146.8
nu hat (MLE)	31.56	nu star (bias corrected)	32.05
Adjusted Level of Significance (β)	0.0479		
Approximate Chi Square Value (32.05, α)	20.11	Adjusted Chi Square Value (32.05, β)	19.99
95% Gamma Approximate UCL (use when n>=50)	33.47	95% Gamma Adjusted UCL (use when n<50)	33.67

Estimates of Gamma Parameters using KM Estimates			
Mean (KM)	23.5	SD (KM)	104.7
Variance (KM)	10959	SE of Mean (KM)	10.06
k hat (KM)	0.0504	k star (KM)	0.055
nu hat (KM)	11.29	nu star (KM)	12.32

APPENDIX B-1C1

PAHs in Soil - All Areas Except Zone 4

Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH diesel and motor oil in milligrams per kilogram (mg/kg)

theta hat (KM)	466.3	theta star (KM)	427.3
80% gamma percentile (KM)	4.382	90% gamma percentile (KM)	40.3
95% gamma percentile (KM)	128.9	99% gamma percentile (KM)	491.9
Gamma Kaplan-Meier (KM) Statistics			
Approximate Chi Square Value (12.32, α)	5.44	Adjusted Chi Square Value (12.32, β)	5.38
95% Gamma Approximate KM-UCL (use when n>=50)	53.24	95% Gamma Adjusted KM-UCL (use when n<50)	53.83
Lognormal GOF Test on Detected Observations Only			
Shapiro Wilk Test Statistic	0.87	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.93	Detected Data Not Lognormal at 5% Significance Leve	
Lilliefors Test Statistic	0.187	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.154	Detected Data Not Lognormal at 5% Significance Leve	
Detected Data Not Lognormal at 5% Significance Leve			
Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	21.68	Mean in Log Scale	0.233
SD in Original Scale	105.4	SD in Log Scale	2.142
95% t UCL (assumes normality of ROS data)	38.2	95% Percentile Bootstrap UCL	39.03
95% BCA Bootstrap UCL	49.63	95% Bootstrap t UCL	74.6
95% H-UCL (Log ROS)	25.49		
Statistics using KM estimates on Logged Data and Assuming Lognormal Distributior			
KM Mean (logged)	1.55	KM Geo Mean	4.71
KM SD (logged)	1.182	95% Critical H Value (KM-Log)	2.391
KM Standard Error of Mean (logged)	0.119	95% H-UCL (KM -Log)	12.38
KM SD (logged)	1.182	95% Critical H Value (KM-Log)	2.391
KM Standard Error of Mean (logged)	0.119		
DL/2 Statistics			
DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	30.27	Mean in Log Scale	1.924
SD in Original Scale	105.6	SD in Log Scale	1.475
95% t UCL (Assumes normality)	46.83	95% H-Stat UCL	29.68
DL/2 is not a recommended method, provided for comparisons and historical reasons			
Nonparametric Distribution Free UCL Statistics			
Data do not follow a Discernible Distribution at 5% Significance Leve			
Suggested UCL to Use			
95% KM (Chebyshev) UCL	67.37		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
Recommendations are based upon data size, data distribution, and skewness
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statisticiar

APPENDIX B-1C1

PAHs in Soil - All Areas Except Zone 4

Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH diesel and motor oil in milligrams per kilogram (mg/kg)

Acenaphthylene

General Statistics			
Total Number of Observations	112	Number of Distinct Observations	70
Number of Detects	74	Number of Non-Detects	38
Number of Distinct Detects	59	Number of Distinct Non-Detects	17
Minimum Detect	2.4	Minimum Non-Detect	2.3
Maximum Detect	2100	Maximum Non-Detect	240
Variance Detects	87349	Percent Non-Detects	33.93%
Mean Detects	94.35	SD Detects	295.5
Median Detects	24	CV Detects	3.132
Skewness Detects	5.669	Kurtosis Detects	34.19
Mean of Logged Detects	3.217	SD of Logged Detects	1.418

Normal GOF Test on Detects Only			
Shapiro Wilk Test Statistic	0.317	Normal GOF Test on Detected Observations Only	
5% Shapiro Wilk P Value	0	Detected Data Not Normal at 5% Significance Leve	
Lilliefors Test Statistic	0.378	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.103	Detected Data Not Normal at 5% Significance Leve	
Detected Data Not Normal at 5% Significance Leve			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
KM Mean	65.19	KM Standard Error of Mean	23.05
KM SD	242.2	95% KM (BCA) UCL	110.5
95% KM (t) UCL	103.4	95% KM (Percentile Bootstrap) UCL	107.8
95% KM (z) UCL	103.1	95% KM Bootstrap t UCL	197.5
90% KM Chebyshev UCL	134.3	95% KM Chebyshev UCL	165.7
97.5% KM Chebyshev UCL	209.2	99% KM Chebyshev UCL	294.6

Gamma GOF Tests on Detected Observations Only			
A-D Test Statistic	5.523	Anderson-Darling GOF Test	
5% A-D Critical Value	0.822	Detected Data Not Gamma Distributed at 5% Significance Leve	
K-S Test Statistic	0.217	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.11	Detected Data Not Gamma Distributed at 5% Significance Leve	
Detected Data Not Gamma Distributed at 5% Significance Leve			

Gamma Statistics on Detected Data Only			
k hat (MLE)	0.48	k star (bias corrected MLE)	0.47
Theta hat (MLE)	196.4	Theta star (bias corrected MLE)	200.8
nu hat (MLE)	71.1	nu star (bias corrected)	69.55
Mean (detects)	94.35		

Gamma ROS Statistics using Imputed Non-Detects			
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs			
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20			
For such situations, GROS method may yield incorrect values of UCLs and BTVs			
This is especially true when the sample size is small.			
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates			
Minimum	0.01	Mean	63.08
Maximum	2100	Median	9.95
SD	243.7	CV	3.864
k hat (MLE)	0.212	k star (bias corrected MLE)	0.212
Theta hat (MLE)	297.4	Theta star (bias corrected MLE)	297
nu hat (MLE)	47.51	nu star (bias corrected)	47.57
Adjusted Level of Significance (β)	0.0479		
Approximate Chi Square Value (47.57, α)	32.74	Adjusted Chi Square Value (47.57, β)	32.58
95% Gamma Approximate UCL (use when n>=50)	91.65	95% Gamma Adjusted UCL (use when n<50)	92.1

Estimates of Gamma Parameters using KM Estimates			
Mean (KM)	65.19	SD (KM)	242.2
Variance (KM)	58665	SE of Mean (KM)	23.05
k hat (KM)	0.0724	k star (KM)	0.0764
nu hat (KM)	16.22	nu star (KM)	17.12

APPENDIX B-1C1

PAHs in Soil - All Areas Except Zone 4

Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH diesel and motor oil in milligrams per kilogram (mg/kg)

theta hat (KM)	900	theta star (KM)	852.7
80% gamma percentile (KM)	28.32	90% gamma percentile (KM)	150
95% gamma percentile (KM)	378.1	99% gamma percentile (KM)	1179

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (17.12, α)	8.76	Adjusted Chi Square Value (17.12, β)	8.682
95% Gamma Approximate KM-UCL (use when n>=50)	127.4	95% Gamma Adjusted KM-UCL (use when n<50)	128.6

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Approximate Test Statistic	0.954	Shapiro Wilk GOF Test	
5% Shapiro Wilk P Value	0.0239	Detected Data Not Lognormal at 5% Significance Leve	
Lilliefors Test Statistic	0.0789	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.103	Detected Data appear Lognormal at 5% Significance Leve	

Detected Data appear Approximate Lognormal at 5% Significance Leve

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	64.08	Mean in Log Scale	2.473
SD in Original Scale	243.4	SD in Log Scale	1.683
95% t UCL (assumes normality of ROS data)	102.2	95% Percentile Bootstrap UCL	104.4
95% BCA Bootstrap UCL	128.1	95% Bootstrap t UCL	197.8
95% H-UCL (Log ROS)	78.07		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distributior

KM Mean (logged)	2.616	KM Geo Mean	13.69
KM SD (logged)	1.527	95% Critical H Value (KM-Log)	2.761
KM Standard Error of Mean (logged)	0.152	95% H-UCL (KM -Log)	65.49
KM SD (logged)	1.527	95% Critical H Value (KM-Log)	2.761
KM Standard Error of Mean (logged)	0.152		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	69.5	Mean in Log Scale	2.77
SD in Original Scale	242.9	SD in Log Scale	1.609
95% t UCL (Assumes normality)	107.6	95% H-Stat UCL	89.96

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Approximate Lognormal Distributed at 5% Significance Leve

Suggested UCL to Use

KM H-UCL	65.49

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
Recommendations are based upon data size, data distribution, and skewness
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statisticiar

APPENDIX B-1C1

PAHs in Soil - All Areas Except Zone 4

Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH diesel and motor oil in milligrams per kilogram (mg/kg)

Anthracene

General Statistics			
Total Number of Observations	112	Number of Distinct Observations	76
Number of Detects	85	Number of Non-Detects	27
Number of Distinct Detects	65	Number of Distinct Non-Detects	14
Minimum Detect	2.3	Minimum Non-Detect	2
Maximum Detect	3800	Maximum Non-Detect	200
Variance Detects	184003	Percent Non-Detects	24.11%
Mean Detects	137.3	SD Detects	429
Median Detects	45	CV Detects	3.124
Skewness Detects	7.676	Kurtosis Detects	64.99
Mean of Logged Detects	3.72	SD of Logged Detects	1.438

Normal GOF Test on Detects Only			
Shapiro Wilk Test Statistic	0.302	Normal GOF Test on Detected Observations Only	
5% Shapiro Wilk P Value	0	Detected Data Not Normal at 5% Significance Leve	
Lilliefors Test Statistic	0.376	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.0962	Detected Data Not Normal at 5% Significance Leve	
Detected Data Not Normal at 5% Significance Leve			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
KM Mean	106.1	KM Standard Error of Mean	35.71
KM SD	375.7	95% KM (BCA) UCL	168.7
95% KM (t) UCL	165.3	95% KM (Percentile Bootstrap) UCL	169.2
95% KM (z) UCL	164.8	95% KM Bootstrap t UCL	267.4
90% KM Chebyshev UCL	213.2	95% KM Chebyshev UCL	261.8
97.5% KM Chebyshev UCL	329.1	99% KM Chebyshev UCL	461.4

Gamma GOF Tests on Detected Observations Only			
A-D Test Statistic	4.093	Anderson-Darling GOF Test	
5% A-D Critical Value	0.816	Detected Data Not Gamma Distributed at 5% Significance Leve	
K-S Test Statistic	0.191	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.102	Detected Data Not Gamma Distributed at 5% Significance Leve	
Detected Data Not Gamma Distributed at 5% Significance Leve			

Gamma Statistics on Detected Data Only			
k hat (MLE)	0.525	k star (bias corrected MLE)	0.514
Theta hat (MLE)	261.7	Theta star (bias corrected MLE)	267.2
nu hat (MLE)	89.18	nu star (bias corrected)	87.36
Mean (detects)	137.3		

Gamma ROS Statistics using Imputed Non-Detects			
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs			
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20			
For such situations, GROS method may yield incorrect values of UCLs and BTVs			
This is especially true when the sample size is small.			
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates			
Minimum	0.01	Mean	104.2
Maximum	3800	Median	26
SD	377.8	CV	3.625
k hat (MLE)	0.243	k star (bias corrected MLE)	0.243
Theta hat (MLE)	428.4	Theta star (bias corrected MLE)	429.4
nu hat (MLE)	54.48	nu star (bias corrected)	54.36
Adjusted Level of Significance (β)	0.0479		
Approximate Chi Square Value (54.36, α)	38.42	Adjusted Chi Square Value (54.36, β)	38.24
95% Gamma Approximate UCL (use when n>=50)	147.4	95% Gamma Adjusted UCL (use when n<50)	148.1

Estimates of Gamma Parameters using KM Estimates			
Mean (KM)	106.1	SD (KM)	375.7
Variance (KM)	141130	SE of Mean (KM)	35.71
k hat (KM)	0.0797	k star (KM)	0.0836
nu hat (KM)	17.86	nu star (KM)	18.72

APPENDIX B-1C1

PAHs in Soil - All Areas Except Zone 4

Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH diesel and motor oil in milligrams per kilogram (mg/kg)

theta hat (KM)	1330	theta star (KM)	1270
80% gamma percentile (KM)	54.84	90% gamma percentile (KM)	258.3
95% gamma percentile (KM)	617.8	99% gamma percentile (KM)	1840
Gamma Kaplan-Meier (KM) Statistics			
Approximate Chi Square Value (18.72, α)	9.912	Adjusted Chi Square Value (18.72, β)	9.828
95% Gamma Approximate KM-UCL (use when n>=50)	200.3	95% Gamma Adjusted KM-UCL (use when n<50)	202
Lognormal GOF Test on Detected Observations Only			
Shapiro Wilk Approximate Test Statistic	0.98	Shapiro Wilk GOF Test	
5% Shapiro Wilk P Value	0.558	Detected Data appear Lognormal at 5% Significance Leve	
Lilliefors Test Statistic	0.0617	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.0962	Detected Data appear Lognormal at 5% Significance Leve	
Detected Data appear Lognormal at 5% Significance Leve			
Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	105.4	Mean in Log Scale	3.112
SD in Original Scale	377.5	SD in Log Scale	1.723
95% t UCL (assumes normality of ROS data)	164.6	95% Percentile Bootstrap UCL	174.6
95% BCA Bootstrap UCL	218.1	95% Bootstrap t UCL	267.5
95% H-UCL (Log ROS)	161.5		
Statistics using KM estimates on Logged Data and Assuming Lognormal Distributior			
KM Mean (logged)	3.137	KM Geo Mean	23.04
KM SD (logged)	1.69	95% Critical H Value (KM-Log)	2.948
KM Standard Error of Mean (logged)	0.164	95% H-UCL (KM -Log)	154.2
KM SD (logged)	1.69	95% Critical H Value (KM-Log)	2.948
KM Standard Error of Mean (logged)	0.164		
DL/2 Statistics			
DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	107.5	Mean in Log Scale	3.186
SD in Original Scale	377.1	SD in Log Scale	1.729
95% t UCL (Assumes normality)	166.6	95% H-Stat UCL	176.1
DL/2 is not a recommended method, provided for comparisons and historical reasons			
Nonparametric Distribution Free UCL Statistics			
Detected Data appear Lognormal Distributed at 5% Significance Leve			
Suggested UCL to Use			
KM H-UCL	154.2		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
Recommendations are based upon data size, data distribution, and skewness
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statisticiar

APPENDIX B-1C1
PAHs in Soil - All Areas Except Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH diesel and motor oil in milligrams per kilogram (mg/kg)

Benzo(a)anthracene

General Statistics			
Total Number of Observations	112	Number of Distinct Observations	78
Number of Detects	94	Number of Non-Detects	18
Number of Distinct Detects	70	Number of Distinct Non-Detects	11
Minimum Detect	1.7	Minimum Non-Detect	1.5
Maximum Detect	12000	Maximum Non-Detect	150
Variance Detects	1822854	Percent Non-Detects	16.07%
Mean Detects	315.4	SD Detects	1350
Median Detects	45	CV Detects	4.28
Skewness Detects	7.524	Kurtosis Detects	62.39
Mean of Logged Detects	3.944	SD of Logged Detects	1.587

Normal GOF Test on Detects Only			
Shapiro Wilk Test Statistic	0.244	Normal GOF Test on Detected Observations Only	
5% Shapiro Wilk P Value	0	Detected Data Not Normal at 5% Significance Leve	
Lilliefors Test Statistic	0.426	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.0916	Detected Data Not Normal at 5% Significance Leve	
Detected Data Not Normal at 5% Significance Leve			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
KM Mean	266.5	KM Standard Error of Mean	117.4
KM SD	1235	95% KM (BCA) UCL	494
95% KM (t) UCL	461.2	95% KM (Percentile Bootstrap) UCL	487.8
95% KM (z) UCL	459.6	95% KM Bootstrap t UCL	870.6
90% KM Chebyshev UCL	618.6	95% KM Chebyshev UCL	778.1
97.5% KM Chebyshev UCL	999.4	99% KM Chebyshev UCL	1434

Gamma GOF Tests on Detected Observations Only			
A-D Test Statistic	9.539	Anderson-Darling GOF Test	
5% A-D Critical Value	0.851	Detected Data Not Gamma Distributed at 5% Significance Leve	
K-S Test Statistic	0.247	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.0993	Detected Data Not Gamma Distributed at 5% Significance Leve	
Detected Data Not Gamma Distributed at 5% Significance Leve			

Gamma Statistics on Detected Data Only			
k hat (MLE)	0.368	k star (bias corrected MLE)	0.364
Theta hat (MLE)	856.1	Theta star (bias corrected MLE)	867.1
nu hat (MLE)	69.27	nu star (bias corrected)	68.39
Mean (detects)	315.4		

Gamma ROS Statistics using Imputed Non-Detects			
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs			
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20			
For such situations, GROS method may yield incorrect values of UCLs and BTVs			
This is especially true when the sample size is small.			
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates			
Minimum	0.01	Mean	264.7
Maximum	12000	Median	39
SD	1241	CV	4.689
k hat (MLE)	0.238	k star (bias corrected MLE)	0.238
Theta hat (MLE)	1112	Theta star (bias corrected MLE)	1114
nu hat (MLE)	53.3	nu star (bias corrected)	53.21
Adjusted Level of Significance (β)	0.0479		
Approximate Chi Square Value (53.21, α)	37.45	Adjusted Chi Square Value (53.21, β)	37.28
95% Gamma Approximate UCL (use when n>=50)	376.1	95% Gamma Adjusted UCL (use when n<50)	377.8

Estimates of Gamma Parameters using KM Estimates			
Mean (KM)	266.5	SD (KM)	1235
Variance (KM)	1526157	SE of Mean (KM)	117.4
k hat (KM)	0.0465	k star (KM)	0.0513
nu hat (KM)	10.43	nu star (KM)	11.48

APPENDIX B-1C1

PAHs in Soil - All Areas Except Zone 4

Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH diesel and motor oil in milligrams per kilogram (mg/kg)

theta hat (KM)	5726	theta star (KM)	5200
80% gamma percentile (KM)	39.41	90% gamma percentile (KM)	420
95% gamma percentile (KM)	1430	99% gamma percentile (KM)	5741
Gamma Kaplan-Meier (KM) Statistics			
Approximate Chi Square Value (11.48, α)	4.887	Adjusted Chi Square Value (11.48, β)	4.831
95% Gamma Approximate KM-UCL (use when n>=50)	626.1	95% Gamma Adjusted KM-UCL (use when n<50)	633.4
Lognormal GOF Test on Detected Observations Only			
Shapiro Wilk Approximate Test Statistic	0.964	Shapiro Wilk GOF Test	
5% Shapiro Wilk P Value	0.0593	Detected Data appear Lognormal at 5% Significance Leve	
Lilliefors Test Statistic	0.0692	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.0916	Detected Data appear Lognormal at 5% Significance Leve	
Detected Data appear Lognormal at 5% Significance Leve			
Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	266	Mean in Log Scale	3.548
SD in Original Scale	1241	SD in Log Scale	1.777
95% t UCL (assumes normality of ROS data)	460.6	95% Percentile Bootstrap UCL	490.8
95% BCA Bootstrap UCL	597.7	95% Bootstrap t UCL	970.8
95% H-UCL (Log ROS)	282.2		
Statistics using KM estimates on Logged Data and Assuming Lognormal Distributior			
KM Mean (logged)	3.55	KM Geo Mean	34.8
KM SD (logged)	1.78	95% Critical H Value (KM-Log)	3.053
KM Standard Error of Mean (logged)	0.172	95% H-UCL (KM -Log)	283.9
KM SD (logged)	1.78	95% Critical H Value (KM-Log)	3.053
KM Standard Error of Mean (logged)	0.172		
DL/2 Statistics			
DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	267.7	Mean in Log Scale	3.596
SD in Original Scale	1241	SD in Log Scale	1.796
95% t UCL (Assumes normality)	462.2	95% H-Stat UCL	308.7
DL/2 is not a recommended method, provided for comparisons and historical reasons			
Nonparametric Distribution Free UCL Statistics			
Detected Data appear Lognormal Distributed at 5% Significance Leve			
Suggested UCL to Use			
KM H-UCL	283.9		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
Recommendations are based upon data size, data distribution, and skewness
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statisticiar

APPENDIX B-1C1

PAHs in Soil - All Areas Except Zone 4

Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH diesel and motor oil in milligrams per kilogram (mg/kg)

Benzo(a)pyrene

General Statistics			
Total Number of Observations	112	Number of Distinct Observations	83
Number of Detects	105	Number of Non-Detects	7
Number of Distinct Detects	79	Number of Distinct Non-Detects	6
Minimum Detect	2.2	Minimum Non-Detect	1.9
Maximum Detect	7900	Maximum Non-Detect	94
Variance Detects	1253776	Percent Non-Detects	6.25%
Mean Detects	328.6	SD Detects	1120
Median Detects	57	CV Detects	3.408
Skewness Detects	5.209	Kurtosis Detects	27.93
Mean of Logged Detects	4.075	SD of Logged Detects	1.693

Normal GOF Test on Detects Only			
Shapiro Wilk Test Statistic	0.3	Normal GOF Test on Detected Observations Only	
5% Shapiro Wilk P Value	0	Detected Data Not Normal at 5% Significance Leve	
Lilliefors Test Statistic	0.407	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.0867	Detected Data Not Normal at 5% Significance Leve	
Detected Data Not Normal at 5% Significance Leve			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
KM Mean	308.9	KM Standard Error of Mean	102.7
KM SD	1082	95% KM (BCA) UCL	501.6
95% KM (t) UCL	479.2	95% KM (Percentile Bootstrap) UCL	485.1
95% KM (z) UCL	477.8	95% KM Bootstrap t UCL	648.7
90% KM Chebyshev UCL	617	95% KM Chebyshev UCL	756.5
97.5% KM Chebyshev UCL	950.2	99% KM Chebyshev UCL	1331

Gamma GOF Tests on Detected Observations Only			
A-D Test Statistic	7.867	Anderson-Darling GOF Test	
5% A-D Critical Value	0.847	Detected Data Not Gamma Distributed at 5% Significance Leve	
K-S Test Statistic	0.204	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.0946	Detected Data Not Gamma Distributed at 5% Significance Leve	
Detected Data Not Gamma Distributed at 5% Significance Leve			

Gamma Statistics on Detected Data Only			
k hat (MLE)	0.385	k star (bias corrected MLE)	0.38
Theta hat (MLE)	853.4	Theta star (bias corrected MLE)	863.8
nu hat (MLE)	80.86	nu star (bias corrected)	79.88
Mean (detects)	328.6		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	308
Maximum	7900	Median	52
SD	1087	CV	3.528
k hat (MLE)	0.312	k star (bias corrected MLE)	0.309
Theta hat (MLE)	987.9	Theta star (bias corrected MLE)	995.6
nu hat (MLE)	69.85	nu star (bias corrected)	69.31
Adjusted Level of Significance (β)	0.0479		
Approximate Chi Square Value (69.31, α)	51.14	Adjusted Chi Square Value (69.31, β)	50.94
95% Gamma Approximate UCL (use when n>=50)	417.4	95% Gamma Adjusted UCL (use when n<50)	419.1

Estimates of Gamma Parameters using KM Estimates			
Mean (KM)	308.9	SD (KM)	1082
Variance (KM)	1170074	SE of Mean (KM)	102.7
k hat (KM)	0.0815	k star (KM)	0.0853
nu hat (KM)	18.26	nu star (KM)	19.11

APPENDIX B-1C1

PAHs in Soil - All Areas Except Zone 4

Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH diesel and motor oil in milligrams per kilogram (mg/kg)

theta hat (KM)	3788	theta star (KM)	3621
80% gamma percentile (KM)	165.7	90% gamma percentile (KM)	760.8
95% gamma percentile (KM)	1799	99% gamma percentile (KM)	5305

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (19.11, α)	10.19	Adjusted Chi Square Value (19.11, β)	10.11
95% Gamma Approximate KM-UCL (use when n>=50)	578.8	95% Gamma Adjusted KM-UCL (use when n<50)	583.7

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Approximate Test Statistic	0.962	Shapiro Wilk GOF Test	
5% Shapiro Wilk P Value	0.0306	Detected Data Not Lognormal at 5% Significance Leve	
Lilliefors Test Statistic	0.0605	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.0867	Detected Data appear Lognormal at 5% Significance Leve	

Detected Data appear Approximate Lognormal at 5% Significance Leve

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	308.7	Mean in Log Scale	3.932
SD in Original Scale	1087	SD in Log Scale	1.758
95% t UCL (assumes normality of ROS data)	479	95% Percentile Bootstrap UCL	494
95% BCA Bootstrap UCL	547.7	95% Bootstrap t UCL	621.7
95% H-UCL (Log ROS)	396.7		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distributior

KM Mean (logged)	3.938	KM Geo Mean	51.3
KM SD (logged)	1.739	95% Critical H Value (KM-Log)	3.005
KM Standard Error of Mean (logged)	0.166	95% H-UCL (KM -Log)	382.2
KM SD (logged)	1.739	95% Critical H Value (KM-Log)	3.005
KM Standard Error of Mean (logged)	0.166		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	309.2	Mean in Log Scale	3.957
SD in Original Scale	1086	SD in Log Scale	1.736
95% t UCL (Assumes normality)	479.4	95% H-Stat UCL	387

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Approximate Lognormal Distributed at 5% Significance Leve

Suggested UCL to Use

KM H-UCL	382.2

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
Recommendations are based upon data size, data distribution, and skewness
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statisticiar

APPENDIX B-1C1
PAHs in Soil - All Areas Except Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH diesel and motor oil in milligrams per kilogram (mg/kg)

Benzo(b)fluoranthene

General Statistics			
Total Number of Observations	112	Number of Distinct Observations	78
Number of Detects	106	Number of Non-Detects	6
Number of Distinct Detects	78	Number of Distinct Non-Detects	5
Minimum Detect	2.2	Minimum Non-Detect	4
Maximum Detect	13000	Maximum Non-Detect	100
Variance Detects	2537742	Percent Non-Detects	5.36%
Mean Detects	450.4	SD Detects	1593
Median Detects	90.5	CV Detects	3.537
Skewness Detects	6.065	Kurtosis Detects	40.81
Mean of Logged Detects	4.444	SD of Logged Detects	1.661

Normal GOF Test on Detects Only			
Shapiro Wilk Test Statistic	0.292	Normal GOF Test on Detected Observations Only	
5% Shapiro Wilk P Value	0	Detected Data Not Normal at 5% Significance Leve	
Lilliefors Test Statistic	0.41	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.0863	Detected Data Not Normal at 5% Significance Leve	
Detected Data Not Normal at 5% Significance Leve			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
KM Mean	427	KM Standard Error of Mean	146.7
KM SD	1546	95% KM (BCA) UCL	692.2
95% KM (t) UCL	670.4	95% KM (Percentile Bootstrap) UCL	680.5
95% KM (z) UCL	668.4	95% KM Bootstrap t UCL	940
90% KM Chebyshev UCL	867.2	95% KM Chebyshev UCL	1067
97.5% KM Chebyshev UCL	1343	99% KM Chebyshev UCL	1887

Gamma GOF Tests on Detected Observations Only			
A-D Test Statistic	7.635	Anderson-Darling GOF Test	
5% A-D Critical Value	0.844	Detected Data Not Gamma Distributed at 5% Significance Leve	
K-S Test Statistic	0.204	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.0942	Detected Data Not Gamma Distributed at 5% Significance Leve	
Detected Data Not Gamma Distributed at 5% Significance Leve			

Gamma Statistics on Detected Data Only			
k hat (MLE)	0.396	k star (bias corrected MLE)	0.391
Theta hat (MLE)	1138	Theta star (bias corrected MLE)	1153
nu hat (MLE)	83.89	nu star (bias corrected)	82.84
Mean (detects)	450.4		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	426.3
Maximum	13000	Median	81.5
SD	1553	CV	3.643
k hat (MLE)	0.325	k star (bias corrected MLE)	0.322
Theta hat (MLE)	1312	Theta star (bias corrected MLE)	1324
nu hat (MLE)	72.76	nu star (bias corrected)	72.14
Adjusted Level of Significance (β)	0.0479		
Approximate Chi Square Value (72.14, α)	53.58	Adjusted Chi Square Value (72.14, β)	53.38
95% Gamma Approximate UCL (use when n>=50)	573.9	95% Gamma Adjusted UCL (use when n<50)	576.1

Estimates of Gamma Parameters using KM Estimates			
Mean (KM)	427	SD (KM)	1546
Variance (KM)	2388782	SE of Mean (KM)	146.7
k hat (KM)	0.0763	k star (KM)	0.0802
nu hat (KM)	17.1	nu star (KM)	17.98

APPENDIX B-1C1
PAHs in Soil - All Areas Except Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH diesel and motor oil in milligrams per kilogram (mg/kg)

theta hat (KM)	5594	theta star (KM)	5321
80% gamma percentile (KM)	204.5	90% gamma percentile (KM)	1015
95% gamma percentile (KM)	2484	99% gamma percentile (KM)	7552
Gamma Kaplan-Meier (KM) Statistics			
Approximate Chi Square Value (17.98, α)	9.373	Adjusted Chi Square Value (17.98, β)	9.292
95% Gamma Approximate KM-UCL (use when n>=50)	819	95% Gamma Adjusted KM-UCL (use when n<50)	826.1
Lognormal GOF Test on Detected Observations Only			
Shapiro Wilk Approximate Test Statistic	0.971	Shapiro Wilk GOF Test	
5% Shapiro Wilk P Value	0.155	Detected Data appear Lognormal at 5% Significance Leve	
Lilliefors Test Statistic	0.0669	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.0863	Detected Data appear Lognormal at 5% Significance Leve	
Detected Data appear Lognormal at 5% Significance Leve			
Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	426.9	Mean in Log Scale	4.317
SD in Original Scale	1553	SD in Log Scale	1.719
95% t UCL (assumes normality of ROS data)	670.2	95% Percentile Bootstrap UCL	695.6
95% BCA Bootstrap UCL	819.6	95% Bootstrap t UCL	951
95% H-UCL (Log ROS)	533.7		
Statistics using KM estimates on Logged Data and Assuming Lognormal Distributior			
KM Mean (logged)	4.316	KM Geo Mean	74.87
KM SD (logged)	1.714	95% Critical H Value (KM-Log)	2.976
KM Standard Error of Mean (logged)	0.163	95% H-UCL (KM -Log)	527.6
KM SD (logged)	1.714	95% Critical H Value (KM-Log)	2.976
KM Standard Error of Mean (logged)	0.163		
DL/2 Statistics			
DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	427.3	Mean in Log Scale	4.332
SD in Original Scale	1552	SD in Log Scale	1.704
95% t UCL (Assumes normality)	670.6	95% H-Stat UCL	524.6
DL/2 is not a recommended method, provided for comparisons and historical reasons			
Nonparametric Distribution Free UCL Statistics			
Detected Data appear Lognormal Distributed at 5% Significance Leve			
Suggested UCL to Use			
KM H-UCL	527.6		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
Recommendations are based upon data size, data distribution, and skewness
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statisticiar

APPENDIX B-1C1
PAHs in Soil - All Areas Except Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH diesel and motor oil in milligrams per kilogram (mg/kg)

Benzo(g,h,i)perylene

General Statistics			
Total Number of Observations	112	Number of Distinct Observations	75
Number of Detects	92	Number of Non-Detects	20
Number of Distinct Detects	67	Number of Distinct Non-Detects	11
Minimum Detect	4.1	Minimum Non-Detect	4
Maximum Detect	3900	Maximum Non-Detect	420
Variance Detects	390866	Percent Non-Detects	17.86%
Mean Detects	228.5	SD Detects	625.2
Median Detects	60	CV Detects	2.736
Skewness Detects	4.361	Kurtosis Detects	19.42
Mean of Logged Detects	4.114	SD of Logged Detects	1.436

Normal GOF Test on Detects Only			
Shapiro Wilk Test Statistic	0.367	Normal GOF Test on Detected Observations Only	
5% Shapiro Wilk P Value	0	Detected Data Not Normal at 5% Significance Leve	
Lilliefors Test Statistic	0.385	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.0926	Detected Data Not Normal at 5% Significance Leve	
Detected Data Not Normal at 5% Significance Leve			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
KM Mean	191.4	KM Standard Error of Mean	54.1
KM SD	569.3	95% KM (BCA) UCL	293.7
95% KM (t) UCL	281.2	95% KM (Percentile Bootstrap) UCL	285.4
95% KM (z) UCL	280.4	95% KM Bootstrap t UCL	345.4
90% KM Chebyshev UCL	353.7	95% KM Chebyshev UCL	427.3
97.5% KM Chebyshev UCL	529.3	99% KM Chebyshev UCL	729.8

Gamma GOF Tests on Detected Observations Only			
A-D Test Statistic	7.199	Anderson-Darling GOF Test	
5% A-D Critical Value	0.822	Detected Data Not Gamma Distributed at 5% Significance Leve	
K-S Test Statistic	0.21	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.0988	Detected Data Not Gamma Distributed at 5% Significance Leve	
Detected Data Not Gamma Distributed at 5% Significance Leve			

Gamma Statistics on Detected Data Only			
k hat (MLE)	0.484	k star (bias corrected MLE)	0.476
Theta hat (MLE)	471.8	Theta star (bias corrected MLE)	480.2
nu hat (MLE)	89.12	nu star (bias corrected)	87.55
Mean (detects)	228.5		

Gamma ROS Statistics using Imputed Non-Detects			
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs			
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20			
For such situations, GROS method may yield incorrect values of UCLs and BTVs			
This is especially true when the sample size is small.			
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates			
Minimum	0.01	Mean	188.8
Maximum	3900	Median	42
SD	572.6	CV	3.032
k hat (MLE)	0.27	k star (bias corrected MLE)	0.269
Theta hat (MLE)	699.8	Theta star (bias corrected MLE)	703.1
nu hat (MLE)	60.45	nu star (bias corrected)	60.16
Adjusted Level of Significance (β)	0.0479		
Approximate Chi Square Value (60.16, α)	43.32	Adjusted Chi Square Value (60.16, β)	43.14
95% Gamma Approximate UCL (use when n>=50)	262.2	95% Gamma Adjusted UCL (use when n<50)	263.3

Estimates of Gamma Parameters using KM Estimates			
Mean (KM)	191.4	SD (KM)	569.3
Variance (KM)	324117	SE of Mean (KM)	54.1
k hat (KM)	0.113	k star (KM)	0.116
nu hat (KM)	25.33	nu star (KM)	25.98

APPENDIX B-1C1

PAHs in Soil - All Areas Except Zone 4

Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH diesel and motor oil in milligrams per kilogram (mg/kg)

theta hat (KM)	1693	theta star (KM)	1650
80% gamma percentile (KM)	161.4	90% gamma percentile (KM)	537.1
95% gamma percentile (KM)	1097	99% gamma percentile (KM)	2820

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (25.98, α)	15.37	Adjusted Chi Square Value (25.98, β)	15.26
95% Gamma Approximate KM-UCL (use when n>=50)	323.7	95% Gamma Adjusted KM-UCL (use when n<50)	326

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Approximate Test Statistic	0.952	Shapiro Wilk GOF Test	
5% Shapiro Wilk P Value	0.00613	Detected Data Not Lognormal at 5% Significance Leve	
Lilliefors Test Statistic	0.0644	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.0926	Detected Data appear Lognormal at 5% Significance Leve	

Detected Data appear Approximate Lognormal at 5% Significance Leve

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	190.3	Mean in Log Scale	3.732
SD in Original Scale	572.1	SD in Log Scale	1.622
95% t UCL (assumes normality of ROS data)	280	95% Percentile Bootstrap UCL	283.2
95% BCA Bootstrap UCL	319.5	95% Bootstrap t UCL	340.8
95% H-UCL (Log ROS)	242.1		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distributior

KM Mean (logged)	3.771	KM Geo Mean	43.42
KM SD (logged)	1.567	95% Critical H Value (KM-Log)	2.806
KM Standard Error of Mean (logged)	0.152	95% H-UCL (KM -Log)	225
KM SD (logged)	1.567	95% Critical H Value (KM-Log)	2.806
KM Standard Error of Mean (logged)	0.152		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	194.7	Mean in Log Scale	3.802
SD in Original Scale	571.2	SD in Log Scale	1.64
95% t UCL (Assumes normality)	284.2	95% H-Stat UCL	269.6

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Approximate Lognormal Distributed at 5% Significance Leve

Suggested UCL to Use

KM H-UCL	225

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
Recommendations are based upon data size, data distribution, and skewness
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statisticiar

APPENDIX B-1C1
PAHs in Soil - All Areas Except Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH diesel and motor oil in milligrams per kilogram (mg/kg)

Benzo(k)fluoranthene

General Statistics			
Total Number of Observations	112	Number of Distinct Observations	78
Number of Detects	92	Number of Non-Detects	20
Number of Distinct Detects	71	Number of Distinct Non-Detects	13
Minimum Detect	2.1	Minimum Non-Detect	2.1
Maximum Detect	5000	Maximum Non-Detect	100
Variance Detects	407965	Percent Non-Detects	17.86%
Mean Detects	192.2	SD Detects	638.7
Median Detects	38.5	CV Detects	3.323
Skewness Detects	5.827	Kurtosis Detects	38.12
Mean of Logged Detects	3.673	SD of Logged Detects	1.581

Normal GOF Test on Detects Only			
Shapiro Wilk Test Statistic	0.315	Normal GOF Test on Detected Observations Only	
5% Shapiro Wilk P Value	0	Detected Data Not Normal at 5% Significance Leve	
Lilliefors Test Statistic	0.383	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.0926	Detected Data Not Normal at 5% Significance Leve	
Detected Data Not Normal at 5% Significance Leve			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
KM Mean	159.4	KM Standard Error of Mean	55.11
KM SD	580.1	95% KM (BCA) UCL	271.7
95% KM (t) UCL	250.8	95% KM (Percentile Bootstrap) UCL	256.7
95% KM (z) UCL	250	95% KM Bootstrap t UCL	365.2
90% KM Chebyshev UCL	324.7	95% KM Chebyshev UCL	399.6
97.5% KM Chebyshev UCL	503.5	99% KM Chebyshev UCL	707.7

Gamma GOF Tests on Detected Observations Only			
A-D Test Statistic	7.084	Anderson-Darling GOF Test	
5% A-D Critical Value	0.84	Detected Data Not Gamma Distributed at 5% Significance Leve	
K-S Test Statistic	0.212	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.0998	Detected Data Not Gamma Distributed at 5% Significance Leve	
Detected Data Not Gamma Distributed at 5% Significance Leve			

Gamma Statistics on Detected Data Only			
k hat (MLE)	0.413	k star (bias corrected MLE)	0.407
Theta hat (MLE)	465.5	Theta star (bias corrected MLE)	472.6
nu hat (MLE)	75.97	nu star (bias corrected)	74.83
Mean (detects)	192.2		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	157.9
Maximum	5000	Median	25
SD	583	CV	3.693
k hat (MLE)	0.248	k star (bias corrected MLE)	0.247
Theta hat (MLE)	636.5	Theta star (bias corrected MLE)	638.3
nu hat (MLE)	55.56	nu star (bias corrected)	55.41
Adjusted Level of Significance (β)	0.0479		
Approximate Chi Square Value (55.41, α)	39.3	Adjusted Chi Square Value (55.41, β)	39.13
95% Gamma Approximate UCL (use when n>=50)	222.6	95% Gamma Adjusted UCL (use when n<50)	223.6

Estimates of Gamma Parameters using KM Estimates			
Mean (KM)	159.4	SD (KM)	580.1
Variance (KM)	336460	SE of Mean (KM)	55.11
k hat (KM)	0.0755	k star (KM)	0.0794
nu hat (KM)	16.91	nu star (KM)	17.79

APPENDIX B-1C1

PAHs in Soil - All Areas Except Zone 4

Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH diesel and motor oil in milligrams per kilogram (mg/kg)

theta hat (KM)	2111	theta star (KM)	2007
80% gamma percentile (KM)	74.79	90% gamma percentile (KM)	376.2
95% gamma percentile (KM)	926.5	99% gamma percentile (KM)	2832
Gamma Kaplan-Meier (KM) Statistics			
Approximate Chi Square Value (17.79, α)	9.24	Adjusted Chi Square Value (17.79, β)	9.16
95% Gamma Approximate KM-UCL (use when n>=50)	306.9	95% Gamma Adjusted KM-UCL (use when n<50)	309.6
Lognormal GOF Test on Detected Observations Only			
Shapiro Wilk Approximate Test Statistic	0.963	Shapiro Wilk GOF Test	
5% Shapiro Wilk P Value	0.048	Detected Data Not Lognormal at 5% Significance Leve	
Lilliefors Test Statistic	0.0514	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.0926	Detected Data appear Lognormal at 5% Significance Leve	
Detected Data appear Approximate Lognormal at 5% Significance Leve			
Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	158.9	Mean in Log Scale	3.229
SD in Original Scale	582.8	SD in Log Scale	1.785
95% t UCL (assumes normality of ROS data)	250.2	95% Percentile Bootstrap UCL	256
95% BCA Bootstrap UCL	302.3	95% Bootstrap t UCL	373.6
95% H-UCL (Log ROS)	208.6		
Statistics using KM estimates on Logged Data and Assuming Lognormal Distributior			
KM Mean (logged)	3.282	KM Geo Mean	26.62
KM SD (logged)	1.706	95% Critical H Value (KM-Log)	2.967
KM Standard Error of Mean (logged)	0.165	95% H-UCL (KM -Log)	184.5
KM SD (logged)	1.706	95% Critical H Value (KM-Log)	2.967
KM Standard Error of Mean (logged)	0.165		
DL/2 Statistics			
DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	160.2	Mean in Log Scale	3.325
SD in Original Scale	582.5	SD in Log Scale	1.719
95% t UCL (Assumes normality)	251.5	95% H-Stat UCL	198.1
DL/2 is not a recommended method, provided for comparisons and historical reasons			
Nonparametric Distribution Free UCL Statistics			
Detected Data appear Approximate Lognormal Distributed at 5% Significance Leve			
Suggested UCL to Use			
KM H-UCL	184.5		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
Recommendations are based upon data size, data distribution, and skewness
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statisticiar

APPENDIX B-1C1
PAHs in Soil - All Areas Except Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH diesel and motor oil in milligrams per kilogram (mg/kg)

Chrysene

General Statistics			
Total Number of Observations	112	Number of Distinct Observations	82
Number of Detects	104	Number of Non-Detects	8
Number of Distinct Detects	79	Number of Distinct Non-Detects	5
Minimum Detect	1.5	Minimum Non-Detect	1.4
Maximum Detect	14000	Maximum Non-Detect	69
Variance Detects	2418921	Percent Non-Detects	7.14%
Mean Detects	377.7	SD Detects	1555
Median Detects	64.5	CV Detects	4.117
Skewness Detects	7.347	Kurtosis Detects	59.91
Mean of Logged Detects	4.17	SD of Logged Detects	1.672

Normal GOF Test on Detects Only			
Shapiro Wilk Test Statistic	0.251	Normal GOF Test on Detected Observations Only	
5% Shapiro Wilk P Value	0	Detected Data Not Normal at 5% Significance Leve	
Lilliefors Test Statistic	0.404	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.0872	Detected Data Not Normal at 5% Significance Leve	
Detected Data Not Normal at 5% Significance Leve			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
KM Mean	351.2	KM Standard Error of Mean	141.9
KM SD	1495	95% KM (BCA) UCL	653.3
95% KM (t) UCL	586.6	95% KM (Percentile Bootstrap) UCL	584.9
95% KM (z) UCL	584.6	95% KM Bootstrap t UCL	1023
90% KM Chebyshev UCL	776.9	95% KM Chebyshev UCL	969.8
97.5% KM Chebyshev UCL	1237	99% KM Chebyshev UCL	1763

Gamma GOF Tests on Detected Observations Only			
A-D Test Statistic	8.706	Anderson-Darling GOF Test	
5% A-D Critical Value	0.849	Detected Data Not Gamma Distributed at 5% Significance Leve	
K-S Test Statistic	0.239	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.095	Detected Data Not Gamma Distributed at 5% Significance Leve	
Detected Data Not Gamma Distributed at 5% Significance Leve			

Gamma Statistics on Detected Data Only			
k hat (MLE)	0.377	k star (bias corrected MLE)	0.372
Theta hat (MLE)	1003	Theta star (bias corrected MLE)	1015
nu hat (MLE)	78.33	nu star (bias corrected)	77.41
Mean (detects)	377.7		

Gamma ROS Statistics using Imputed Non-Detects			
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs			
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20			
For such situations, GROS method may yield incorrect values of UCLs and BTVs			
This is especially true when the sample size is small.			
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates			
Minimum	0.01	Mean	350.8
Maximum	14000	Median	58.5
SD	1501	CV	4.28
k hat (MLE)	0.298	k star (bias corrected MLE)	0.296
Theta hat (MLE)	1177	Theta star (bias corrected MLE)	1185
nu hat (MLE)	66.74	nu star (bias corrected)	66.28
Adjusted Level of Significance (β)	0.0479		
Approximate Chi Square Value (66.28, α)	48.55	Adjusted Chi Square Value (66.28, β)	48.35
95% Gamma Approximate UCL (use when n>=50)	478.9	95% Gamma Adjusted UCL (use when n<50)	480.9

Estimates of Gamma Parameters using KM Estimates			
Mean (KM)	351.2	SD (KM)	1495
Variance (KM)	2233706	SE of Mean (KM)	141.9
k hat (KM)	0.0552	k star (KM)	0.0597
nu hat (KM)	12.37	nu star (KM)	13.37

APPENDIX B-1C1

PAHs in Soil - All Areas Except Zone 4

Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH diesel and motor oil in milligrams per kilogram (mg/kg)

theta hat (KM)	6360	theta star (KM)	5883
80% gamma percentile (KM)	83.57	90% gamma percentile (KM)	657.4
95% gamma percentile (KM)	1966	99% gamma percentile (KM)	7101
Gamma Kaplan-Meier (KM) Statistics			
Approximate Chi Square Value (13.37, α)	6.144	Adjusted Chi Square Value (13.37, β)	6.08
95% Gamma Approximate KM-UCL (use when n>=50)	764.4	95% Gamma Adjusted KM-UCL (use when n<50)	772.5
Lognormal GOF Test on Detected Observations Only			
Shapiro Wilk Approximate Test Statistic	0.973	Shapiro Wilk GOF Test	
5% Shapiro Wilk P Value	0.196	Detected Data appear Lognormal at 5% Significance Leve	
Lilliefors Test Statistic	0.0723	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.0872	Detected Data appear Lognormal at 5% Significance Leve	
Detected Data appear Lognormal at 5% Significance Leve			
Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	351.1	Mean in Log Scale	3.948
SD in Original Scale	1501	SD in Log Scale	1.822
95% t UCL (assumes normality of ROS data)	586.4	95% Percentile Bootstrap UCL	612.8
95% BCA Bootstrap UCL	736.9	95% Bootstrap t UCL	1027
95% H-UCL (Log ROS)	465.8		
Statistics using KM estimates on Logged Data and Assuming Lognormal Distributior			
KM Mean (logged)	3.946	KM Geo Mean	51.74
KM SD (logged)	1.817	95% Critical H Value (KM-Log)	3.098
KM Standard Error of Mean (logged)	0.173	95% H-UCL (KM -Log)	460
KM SD (logged)	1.817	95% Critical H Value (KM-Log)	3.098
KM Standard Error of Mean (logged)	0.173		
DL/2 Statistics			
DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	351.3	Mean in Log Scale	3.949
SD in Original Scale	1501	SD in Log Scale	1.838
95% t UCL (Assumes normality)	586.6	95% H-Stat UCL	484.8
DL/2 is not a recommended method, provided for comparisons and historical reasons			
Nonparametric Distribution Free UCL Statistics			
Detected Data appear Lognormal Distributed at 5% Significance Leve			
Suggested UCL to Use			
KM H-UCL	460		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
Recommendations are based upon data size, data distribution, and skewness
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statisticiar

APPENDIX B-1C1
PAHs in Soil - All Areas Except Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH diesel and motor oil in milligrams per kilogram (mg/kg)

Dibenzo(a,h)anthracene

General Statistics			
Total Number of Observations	112	Number of Distinct Observations	66
Number of Detects	63	Number of Non-Detects	49
Number of Distinct Detects	47	Number of Distinct Non-Detects	22
Minimum Detect	3.8	Minimum Non-Detect	3.4
Maximum Detect	1100	Maximum Non-Detect	340
Variance Detects	37503	Percent Non-Detects	43.75%
Mean Detects	73.36	SD Detects	193.7
Median Detects	18	CV Detects	2.64
Skewness Detects	4.388	Kurtosis Detects	19.89
Mean of Logged Detects	3.011	SD of Logged Detects	1.374

Normal GOF Test on Detects Only			
Shapiro Wilk Test Statistic	0.385	Normal GOF Test on Detected Observations Only	
5% Shapiro Wilk P Value	0	Detected Data Not Normal at 5% Significance Leve	
Lilliefors Test Statistic	0.369	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.111	Detected Data Not Normal at 5% Significance Leve	
Detected Data Not Normal at 5% Significance Leve			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
KM Mean	44.6	KM Standard Error of Mean	14.12
KM SD	148	95% KM (BCA) UCL	70.07
95% KM (t) UCL	68.01	95% KM (Percentile Bootstrap) UCL	69.46
95% KM (z) UCL	67.82	95% KM Bootstrap t UCL	103
90% KM Chebyshev UCL	86.95	95% KM Chebyshev UCL	106.1
97.5% KM Chebyshev UCL	132.8	99% KM Chebyshev UCL	185.1

Gamma GOF Tests on Detected Observations Only			
A-D Test Statistic	5.603	Anderson-Darling GOF Test	
5% A-D Critical Value	0.817	Detected Data Not Gamma Distributed at 5% Significance Leve	
K-S Test Statistic	0.232	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.119	Detected Data Not Gamma Distributed at 5% Significance Leve	
Detected Data Not Gamma Distributed at 5% Significance Leve			

Gamma Statistics on Detected Data Only			
k hat (MLE)	0.495	k star (bias corrected MLE)	0.482
Theta hat (MLE)	148.1	Theta star (bias corrected MLE)	152.1
nu hat (MLE)	62.43	nu star (bias corrected)	60.79
Mean (detects)	73.36		

Gamma ROS Statistics using Imputed Non-Detects			
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs			
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20			
For such situations, GROS method may yield incorrect values of UCLs and BTVs			
This is especially true when the sample size is small.			
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates			
Minimum	0.01	Mean	41.84
Maximum	1100	Median	4.55
SD	149.2	CV	3.566
k hat (MLE)	0.189	k star (bias corrected MLE)	0.19
Theta hat (MLE)	221.3	Theta star (bias corrected MLE)	220.3
nu hat (MLE)	42.35	nu star (bias corrected)	42.55
Adjusted Level of Significance (β)	0.0479		
Approximate Chi Square Value (42.55, α)	28.6	Adjusted Chi Square Value (42.55, β)	28.45
95% Gamma Approximate UCL (use when n>=50)	62.26	95% Gamma Adjusted UCL (use when n<50)	62.59

Estimates of Gamma Parameters using KM Estimates			
Mean (KM)	44.6	SD (KM)	148
Variance (KM)	21896	SE of Mean (KM)	14.12
k hat (KM)	0.0908	k star (KM)	0.0944
nu hat (KM)	20.35	nu star (KM)	21.14

APPENDIX B-1C1
PAHs in Soil - All Areas Except Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH diesel and motor oil in milligrams per kilogram (mg/kg)

theta hat (KM)	490.9	theta star (KM)	472.6
80% gamma percentile (KM)	28.35	90% gamma percentile (KM)	115.7
95% gamma percentile (KM)	259.6	99% gamma percentile (KM)	729.2
Gamma Kaplan-Meier (KM) Statistics			
Approximate Chi Square Value (21.14, α)	11.69	Adjusted Chi Square Value (21.14, β)	11.6
95% Gamma Approximate KM-UCL (use when n>=50)	80.62	95% Gamma Adjusted KM-UCL (use when n<50)	81.25
Lognormal GOF Test on Detected Observations Only			
Shapiro Wilk Approximate Test Statistic	0.903	Shapiro Wilk GOF Test	
5% Shapiro Wilk P Value	3.62E-05	Detected Data Not Lognormal at 5% Significance Leve	
Lilliefors Test Statistic	0.133	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.111	Detected Data Not Lognormal at 5% Significance Leve	
Detected Data Not Lognormal at 5% Significance Leve			
Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	42.98	Mean in Log Scale	2.051
SD in Original Scale	148.8	SD in Log Scale	1.66
95% t UCL (assumes normality of ROS data)	66.31	95% Percentile Bootstrap UCL	66.69
95% BCA Bootstrap UCL	77.44	95% Bootstrap t UCL	98.91
95% H-UCL (Log ROS)	48.79		
Statistics using KM estimates on Logged Data and Assuming Lognormal Distributior			
KM Mean (logged)	2.401	KM Geo Mean	11.03
KM SD (logged)	1.321	95% Critical H Value (KM-Log)	2.535
KM Standard Error of Mean (logged)	0.132	95% H-UCL (KM -Log)	36.25
KM SD (logged)	1.321	95% Critical H Value (KM-Log)	2.535
KM Standard Error of Mean (logged)	0.132		
DL/2 Statistics			
DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	51.92	Mean in Log Scale	2.589
SD in Original Scale	149.1	SD in Log Scale	1.513
95% t UCL (Assumes normality)	75.28	95% H-Stat UCL	62.03
DL/2 is not a recommended method, provided for comparisons and historical reasons			
Nonparametric Distribution Free UCL Statistics			
Data do not follow a Discernible Distribution at 5% Significance Leve			
Suggested UCL to Use			
95% KM (Chebyshev) UCL	106.1		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
Recommendations are based upon data size, data distribution, and skewness
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statisticiar

APPENDIX B-1C1
PAHs in Soil - All Areas Except Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH diesel and motor oil in milligrams per kilogram (mg/kg)

Fluoranthene

General Statistics			
Total Number of Observations	112	Number of Distinct Observations	84
Number of Detects	106	Number of Non-Detects	6
Number of Distinct Detects	81	Number of Distinct Non-Detects	6
Minimum Detect	2	Minimum Non-Detect	1.4
Maximum Detect	29000	Maximum Non-Detect	79
Variance Detects	8530057	Percent Non-Detects	5.36%
Mean Detects	548.7	SD Detects	2921
Median Detects	75	CV Detects	5.323
Skewness Detects	9.102	Kurtosis Detects	87.98
Mean of Logged Detects	4.308	SD of Logged Detects	1.681

Normal GOF Test on Detects Only			
Shapiro Wilk Test Statistic	0.19	Normal GOF Test on Detected Observations Only	
5% Shapiro Wilk P Value	0	Detected Data Not Normal at 5% Significance Leve	
Lilliefors Test Statistic	0.434	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.0863	Detected Data Not Normal at 5% Significance Leve	
Detected Data Not Normal at 5% Significance Leve			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
KM Mean	519.9	KM Standard Error of Mean	268.7
KM SD	2830	95% KM (BCA) UCL	1042
95% KM (t) UCL	965.7	95% KM (Percentile Bootstrap) UCL	1016
95% KM (z) UCL	962	95% KM Bootstrap t UCL	2220
90% KM Chebyshev UCL	1326	95% KM Chebyshev UCL	1691
97.5% KM Chebyshev UCL	2198	99% KM Chebyshev UCL	3194

Gamma GOF Tests on Detected Observations Only			
A-D Test Statistic	10.95	Anderson-Darling GOF Test	
5% A-D Critical Value	0.858	Detected Data Not Gamma Distributed at 5% Significance Leve	
K-S Test Statistic	0.265	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.0949	Detected Data Not Gamma Distributed at 5% Significance Leve	
Detected Data Not Gamma Distributed at 5% Significance Leve			

Gamma Statistics on Detected Data Only			
k hat (MLE)	0.338	k star (bias corrected MLE)	0.335
Theta hat (MLE)	1622	Theta star (bias corrected MLE)	1638
nu hat (MLE)	71.7	nu star (bias corrected)	71.01
Mean (detects)	548.7		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	519.3
Maximum	29000	Median	68
SD	2843	CV	5.475
k hat (MLE)	0.287	k star (bias corrected MLE)	0.285
Theta hat (MLE)	1810	Theta star (bias corrected MLE)	1821
nu hat (MLE)	64.25	nu star (bias corrected)	63.86
Adjusted Level of Significance (β)	0.0479		
Approximate Chi Square Value (63.86, α)	46.48	Adjusted Chi Square Value (63.86, β)	46.29
95% Gamma Approximate UCL (use when n>=50)	713.5	95% Gamma Adjusted UCL (use when n<50)	716.5

Estimates of Gamma Parameters using KM Estimates			
Mean (KM)	519.9	SD (KM)	2830
Variance (KM)	8011550	SE of Mean (KM)	268.7
k hat (KM)	0.0337	k star (KM)	0.0388
nu hat (KM)	7.559	nu star (KM)	8.689

APPENDIX B-1C1

PAHs in Soil - All Areas Except Zone 4

Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH diesel and motor oil in milligrams per kilogram (mg/kg)

theta hat (KM)	15409	theta star (KM)	13403
80% gamma percentile (KM)	24.7	90% gamma percentile (KM)	533.4
95% gamma percentile (KM)	2450	99% gamma percentile (KM)	12417
Gamma Kaplan-Meier (KM) Statistics			
Approximate Chi Square Value (8.69, α)	3.14	Adjusted Chi Square Value (8.69, β)	3.097
95% Gamma Approximate KM-UCL (use when n>=50)	1439	95% Gamma Adjusted KM-UCL (use when n<50)	1459
Lognormal GOF Test on Detected Observations Only			
Shapiro Wilk Approximate Test Statistic	0.968	Shapiro Wilk GOF Test	
5% Shapiro Wilk P Value	0.0935	Detected Data appear Lognormal at 5% Significance Leve	
Lilliefors Test Statistic	0.0744	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.0863	Detected Data appear Lognormal at 5% Significance Leve	
Detected Data appear Lognormal at 5% Significance Leve			
Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	519.8	Mean in Log Scale	4.167
SD in Original Scale	2843	SD in Log Scale	1.762
95% t UCL (assumes normality of ROS data)	965.4	95% Percentile Bootstrap UCL	1022
95% BCA Bootstrap UCL	1415	95% Bootstrap t UCL	2347
95% H-UCL (Log ROS)	505.8		
Statistics using KM estimates on Logged Data and Assuming Lognormal Distributior			
KM Mean (logged)	4.164	KM Geo Mean	64.31
KM SD (logged)	1.761	95% Critical H Value (KM-Log)	3.031
KM Standard Error of Mean (logged)	0.168	95% H-UCL (KM -Log)	503.1
KM SD (logged)	1.761	95% Critical H Value (KM-Log)	3.031
KM Standard Error of Mean (logged)	0.168		
DL/2 Statistics			
DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	520.1	Mean in Log Scale	4.175
SD in Original Scale	2843	SD in Log Scale	1.763
95% t UCL (Assumes normality)	965.7	95% H-Stat UCL	510.8
DL/2 is not a recommended method, provided for comparisons and historical reasons			
Nonparametric Distribution Free UCL Statistics			
Detected Data appear Lognormal Distributed at 5% Significance Leve			
Suggested UCL to Use			
KM H-UCL	503.1		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
Recommendations are based upon data size, data distribution, and skewness
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statisticiar

APPENDIX B-1C1
PAHs in Soil - All Areas Except Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH diesel and motor oil in milligrams per kilogram (mg/kg)

Fluorene

General Statistics

Total Number of Observations	112	Number of Distinct Observations	47
Number of Detects	37	Number of Non-Detects	75
Number of Distinct Detects	29	Number of Distinct Non-Detects	22
Minimum Detect	2.4	Minimum Non-Detect	2.1
Maximum Detect	1000	Maximum Non-Detect	220
Variance Detects	31356	Percent Non-Detects	66.96%
Mean Detects	73.18	SD Detects	177.1
Median Detects	12	CV Detects	2.42
Skewness Detects	4.39	Kurtosis Detects	21.75
Mean of Logged Detects	2.895	SD of Logged Detects	1.567

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.439	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.936	Detected Data Not Normal at 5% Significance Leve	
Lilliefors Test Statistic	0.352	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.144	Detected Data Not Normal at 5% Significance Leve	
Detected Data Not Normal at 5% Significance Leve			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	26.23	KM Standard Error of Mean	10.14
KM SD	105.8	95% KM (BCA) UCL	43.64
95% KM (t) UCL	43.05	95% KM (Percentile Bootstrap) UCL	44.88
95% KM (z) UCL	42.91	95% KM Bootstrap t UCL	66.36
90% KM Chebyshev UCL	56.65	95% KM Chebyshev UCL	70.42
97.5% KM Chebyshev UCL	89.54	99% KM Chebyshev UCL	127.1

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	2.669	Anderson-Darling GOF Test	
5% A-D Critical Value	0.821	Detected Data Not Gamma Distributed at 5% Significance Leve	
K-S Test Statistic	0.231	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.154	Detected Data Not Gamma Distributed at 5% Significance Leve	
Detected Data Not Gamma Distributed at 5% Significance Leve			

Gamma Statistics on Detected Data Only

k hat (MLE)	0.46	k star (bias corrected MLE)	0.441
Theta hat (MLE)	159	Theta star (bias corrected MLE)	166
nu hat (MLE)	34.06	nu star (bias corrected)	32.63
Mean (detects)	73.18		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	24.18
Maximum	1000	Median	0.01
SD	106.6	CV	4.408
k hat (MLE)	0.145	k star (bias corrected MLE)	0.147
Theta hat (MLE)	166.4	Theta star (bias corrected MLE)	164.1
nu hat (MLE)	32.55	nu star (bias corrected)	33.01
Adjusted Level of Significance (β)	0.0479		
Approximate Chi Square Value (33.01, α)	20.88	Adjusted Chi Square Value (33.01, β)	20.75
95% Gamma Approximate UCL (use when n>=50)	38.24	95% Gamma Adjusted UCL (use when n<50)	38.47

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	26.23	SD (KM)	105.8
Variance (KM)	11184	SE of Mean (KM)	10.14
k hat (KM)	0.0615	k star (KM)	0.0658
nu hat (KM)	13.78	nu star (KM)	14.74

APPENDIX B-1C1

PAHs in Soil - All Areas Except Zone 4

Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH diesel and motor oil in milligrams per kilogram (mg/kg)

theta hat (KM)	426.4	theta star (KM)	398.5
80% gamma percentile (KM)	8.101	90% gamma percentile (KM)	53.8
95% gamma percentile (KM)	149.6	99% gamma percentile (KM)	508.1

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (14.74, α)	7.084	Adjusted Chi Square Value (14.74, β)	7.015
95% Gamma Approximate KM-UCL (use when n>=50)	54.59	95% Gamma Adjusted KM-UCL (use when n<50)	55.13

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.923	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.936	Detected Data Not Lognormal at 5% Significance Leve	
Lilliefors Test Statistic	0.137	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.144	Detected Data appear Lognormal at 5% Significance Leve	

Detected Data appear Approximate Lognormal at 5% Significance Leve

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	24.75	Mean in Log Scale	0.354
SD in Original Scale	106.5	SD in Log Scale	2.299
95% t UCL (assumes normality of ROS data)	41.44	95% Percentile Bootstrap UCL	42.99
95% BCA Bootstrap UCL	53.66	95% Bootstrap t UCL	66.46
95% H-UCL (Log ROS)	44.81		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distributior

KM Mean (logged)	1.561	KM Geo Mean	4.765
KM SD (logged)	1.345	95% Critical H Value (KM-Log)	2.56
KM Standard Error of Mean (logged)	0.134	95% H-UCL (KM -Log)	16.31
KM SD (logged)	1.345	95% Critical H Value (KM-Log)	2.56
KM Standard Error of Mean (logged)	0.134		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	30.78	Mean in Log Scale	1.818
SD in Original Scale	106.2	SD in Log Scale	1.579
95% t UCL (Assumes normality)	47.43	95% H-Stat UCL	32.71

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Approximate Lognormal Distributed at 5% Significance Leve

Suggested UCL to Use

KM H-UCL	16.31

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
Recommendations are based upon data size, data distribution, and skewness
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statisticiar

APPENDIX B-1C1
PAHs in Soil - All Areas Except Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH diesel and motor oil in milligrams per kilogram (mg/kg)

Indeno(1,2,3-cd)pyrene

General Statistics			
Total Number of Observations	112	Number of Distinct Observations	71
Number of Detects	81	Number of Non-Detects	31
Number of Distinct Detects	60	Number of Distinct Non-Detects	17
Minimum Detect	4	Minimum Non-Detect	3.9
Maximum Detect	3100	Maximum Non-Detect	410
Variance Detects	265083	Percent Non-Detects	27.68%
Mean Detects	185	SD Detects	514.9
Median Detects	37	CV Detects	2.782
Skewness Detects	4.201	Kurtosis Detects	17.91
Mean of Logged Detects	3.831	SD of Logged Detects	1.429

Normal GOF Test on Detects Only			
Shapiro Wilk Test Statistic	0.369	Normal GOF Test on Detected Observations Only	
5% Shapiro Wilk P Value	0	Detected Data Not Normal at 5% Significance Leve	
Lilliefors Test Statistic	0.404	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.0985	Detected Data Not Normal at 5% Significance Leve	
Detected Data Not Normal at 5% Significance Leve			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
KM Mean	138.7	KM Standard Error of Mean	42.02
KM SD	441.8	95% KM (BCA) UCL	212.2
95% KM (t) UCL	208.4	95% KM (Percentile Bootstrap) UCL	216.4
95% KM (z) UCL	207.8	95% KM Bootstrap t UCL	266.3
90% KM Chebyshev UCL	264.8	95% KM Chebyshev UCL	321.9
97.5% KM Chebyshev UCL	401.1	99% KM Chebyshev UCL	556.8

Gamma GOF Tests on Detected Observations Only			
A-D Test Statistic	7.619	Anderson-Darling GOF Test	
5% A-D Critical Value	0.828	Detected Data Not Gamma Distributed at 5% Significance Leve	
K-S Test Statistic	0.236	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.105	Detected Data Not Gamma Distributed at 5% Significance Leve	
Detected Data Not Gamma Distributed at 5% Significance Leve			

Gamma Statistics on Detected Data Only			
k hat (MLE)	0.463	k star (bias corrected MLE)	0.454
Theta hat (MLE)	400	Theta star (bias corrected MLE)	407.9
nu hat (MLE)	74.94	nu star (bias corrected)	73.49
Mean (detects)	185		

Gamma ROS Statistics using Imputed Non-Detects			
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs			
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20			
For such situations, GROS method may yield incorrect values of UCLs and BTVs			
This is especially true when the sample size is small.			
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates			
Minimum	0.01	Mean	135.3
Maximum	3100	Median	25
SD	444.7	CV	3.287
k hat (MLE)	0.222	k star (bias corrected MLE)	0.222
Theta hat (MLE)	608.1	Theta star (bias corrected MLE)	608.1
nu hat (MLE)	49.83	nu star (bias corrected)	49.83
Adjusted Level of Significance (β)	0.0479		
Approximate Chi Square Value (49.83, α)	34.63	Adjusted Chi Square Value (49.83, β)	34.46
95% Gamma Approximate UCL (use when n>=50)	194.7	95% Gamma Adjusted UCL (use when n<50)	195.6

Estimates of Gamma Parameters using KM Estimates			
Mean (KM)	138.7	SD (KM)	441.8
Variance (KM)	195185	SE of Mean (KM)	42.02
k hat (KM)	0.0985	k star (KM)	0.102
nu hat (KM)	22.07	nu star (KM)	22.82

APPENDIX B-1C1
PAHs in Soil - All Areas Except Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH diesel and motor oil in milligrams per kilogram (mg/kg)

theta hat (KM)	1407	theta star (KM)	1362
80% gamma percentile (KM)	98.8	90% gamma percentile (KM)	371.9
95% gamma percentile (KM)	804.1	99% gamma percentile (KM)	2183

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (22.82, α)	12.95	Adjusted Chi Square Value (22.82, β)	12.85
95% Gamma Approximate KM-UCL (use when n>=50)	244.3	95% Gamma Adjusted KM-UCL (use when n<50)	246.2

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Approximate Test Statistic	0.935	Shapiro Wilk GOF Test	
5% Shapiro Wilk P Value	5.33E-04	Detected Data Not Lognormal at 5% Significance Leve	
Lilliefors Test Statistic	0.0813	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.0985	Detected Data appear Lognormal at 5% Significance Leve	

Detected Data appear Approximate Lognormal at 5% Significance Leve

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	137	Mean in Log Scale	3.28
SD in Original Scale	444	SD in Log Scale	1.624
95% t UCL (assumes normality of ROS data)	206.6	95% Percentile Bootstrap UCL	209.1
95% BCA Bootstrap UCL	233.8	95% Bootstrap t UCL	251.4
95% H-UCL (Log ROS)	154.7		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distributior

KM Mean (logged)	3.367	KM Geo Mean	29
KM SD (logged)	1.526	95% Critical H Value (KM-Log)	2.759
KM Standard Error of Mean (logged)	0.151	95% H-UCL (KM -Log)	138.4
KM SD (logged)	1.526	95% Critical H Value (KM-Log)	2.759
KM Standard Error of Mean (logged)	0.151		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	145.2	Mean in Log Scale	3.479
SD in Original Scale	442.8	SD in Log Scale	1.604
95% t UCL (Assumes normality)	214.6	95% H-Stat UCL	181.2

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Detected Data appear Approximate Lognormal Distributed at 5% Significance Leve

Suggested UCL to Use

KM H-UCL	138.4

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
Recommendations are based upon data size, data distribution, and skewness
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statisticiar

APPENDIX B-1C1
PAHs in Soil - All Areas Except Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH diesel and motor oil in milligrams per kilogram (mg/kg)

Naphthalene

General Statistics

Total Number of Observations	112	Number of Distinct Observations	71
Number of Detects	82	Number of Non-Detects	30
Number of Distinct Detects	61	Number of Distinct Non-Detects	17
Minimum Detect	3.5	Minimum Non-Detect	3.4
Maximum Detect	1500	Maximum Non-Detect	340
Variance Detects	64463	Percent Non-Detects	26.79%
Mean Detects	114	SD Detects	253.9
Median Detects	39	CV Detects	2.227
Skewness Detects	4.18	Kurtosis Detects	18.26
Mean of Logged Detects	3.664	SD of Logged Detects	1.365

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.44	Normal GOF Test on Detected Observations Only	
5% Shapiro Wilk P Value	0	Detected Data Not Normal at 5% Significance Leve	
Lilliefors Test Statistic	0.341	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.098	Detected Data Not Normal at 5% Significance Leve	
Detected Data Not Normal at 5% Significance Leve			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	86.53	KM Standard Error of Mean	21.02
KM SD	220.9	95% KM (BCA) UCL	119.1
95% KM (t) UCL	121.4	95% KM (Percentile Bootstrap) UCL	124.3
95% KM (z) UCL	121.1	95% KM Bootstrap t UCL	147.3
90% KM Chebyshev UCL	149.6	95% KM Chebyshev UCL	178.2
97.5% KM Chebyshev UCL	217.8	99% KM Chebyshev UCL	295.7

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	4.147	Anderson-Darling GOF Test	
5% A-D Critical Value	0.811	Detected Data Not Gamma Distributed at 5% Significance Leve	
K-S Test Statistic	0.178	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.104	Detected Data Not Gamma Distributed at 5% Significance Leve	
Detected Data Not Gamma Distributed at 5% Significance Leve			

Gamma Statistics on Detected Data Only

k hat (MLE)	0.579	k star (bias corrected MLE)	0.566
Theta hat (MLE)	196.8	Theta star (bias corrected MLE)	201.3
nu hat (MLE)	94.99	nu star (bias corrected)	92.84
Mean (detects)	114		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	84.18
Maximum	1500	Median	20.5
SD	222.6	CV	2.644
k hat (MLE)	0.245	k star (bias corrected MLE)	0.245
Theta hat (MLE)	343.1	Theta star (bias corrected MLE)	344
nu hat (MLE)	54.96	nu star (bias corrected)	54.82
Adjusted Level of Significance (β)	0.0479		
Approximate Chi Square Value (54.82, α)	38.81	Adjusted Chi Square Value (54.82, β)	38.63
95% Gamma Approximate UCL (use when n>=50)	118.9	95% Gamma Adjusted UCL (use when n<50)	119.5

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	86.53	SD (KM)	220.9
Variance (KM)	48804	SE of Mean (KM)	21.02
k hat (KM)	0.153	k star (KM)	0.155
nu hat (KM)	34.36	nu star (KM)	34.78

APPENDIX B-1C1
PAHs in Soil - All Areas Except Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH diesel and motor oil in milligrams per kilogram (mg/kg)

theta hat (KM)	564	theta star (KM)	557.3
80% gamma percentile (KM)	96.82	90% gamma percentile (KM)	257.7
95% gamma percentile (KM)	473	99% gamma percentile (KM)	1093

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (34.78, α)	22.28	Adjusted Chi Square Value (34.78, β)	22.15
95% Gamma Approximate KM-UCL (use when n>=50)	135	95% Gamma Adjusted KM-UCL (use when n<50)	135.8

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Approximate Test Statistic	0.961	Shapiro Wilk GOF Test	
5% Shapiro Wilk P Value	0.0543	Detected Data appear Lognormal at 5% Significance Leve	
Lilliefors Test Statistic	0.0574	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.098	Detected Data appear Lognormal at 5% Significance Leve	
Detected Data appear Lognormal at 5% Significance Leve			

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	85.39	Mean in Log Scale	3.064
SD in Original Scale	222.1	SD in Log Scale	1.623
95% t UCL (assumes normality of ROS data)	120.2	95% Percentile Bootstrap UCL	121.7
95% BCA Bootstrap UCL	131.8	95% Bootstrap t UCL	149.3
95% H-UCL (Log ROS)	124.4		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distributior

KM Mean (logged)	3.158	KM Geo Mean	23.52
KM SD (logged)	1.509	95% Critical H Value (KM-Log)	2.741
KM Standard Error of Mean (logged)	0.148	95% H-UCL (KM -Log)	108.8
KM SD (logged)	1.509	95% Critical H Value (KM-Log)	2.741
KM Standard Error of Mean (logged)	0.148		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	89.8	Mean in Log Scale	3.213
SD in Original Scale	221.5	SD in Log Scale	1.596
95% t UCL (Assumes normality)	124.5	95% H-Stat UCL	136.7

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Detected Data appear Lognormal Distributed at 5% Significance Leve

Suggested UCL to Use

KM H-UCL	108.8

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
Recommendations are based upon data size, data distribution, and skewness
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statisticiar

APPENDIX B-1C1
PAHs in Soil - All Areas Except Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH diesel and motor oil in milligrams per kilogram (mg/kg)

Phenanthrene

General Statistics			
Total Number of Observations	112	Number of Distinct Observations	81
Number of Detects	102	Number of Non-Detects	10
Number of Distinct Detects	75	Number of Distinct Non-Detects	7
Minimum Detect	2.7	Minimum Non-Detect	1.8
Maximum Detect	25000	Maximum Non-Detect	89
Variance Detects	6493024	Percent Non-Detects	8.93%
Mean Detects	470.7	SD Detects	2548
Median Detects	60	CV Detects	5.413
Skewness Detects	9.118	Kurtosis Detects	87.38
Mean of Logged Detects	4.173	SD of Logged Detects	1.61

Normal GOF Test on Detects Only			
Shapiro Wilk Test Statistic	0.186	Normal GOF Test on Detected Observations Only	
5% Shapiro Wilk P Value	0	Detected Data Not Normal at 5% Significance Leve	
Lilliefors Test Statistic	0.427	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.088	Detected Data Not Normal at 5% Significance Leve	
Detected Data Not Normal at 5% Significance Leve			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
KM Mean	429.7	KM Standard Error of Mean	230.1
KM SD	2423	95% KM (BCA) UCL	897.1
95% KM (t) UCL	811.4	95% KM (Percentile Bootstrap) UCL	876.5
95% KM (z) UCL	808.2	95% KM Bootstrap t UCL	2381
90% KM Chebyshev UCL	1120	95% KM Chebyshev UCL	1433
97.5% KM Chebyshev UCL	1867	99% KM Chebyshev UCL	2719

Gamma GOF Tests on Detected Observations Only			
A-D Test Statistic	11.33	Anderson-Darling GOF Test	
5% A-D Critical Value	0.858	Detected Data Not Gamma Distributed at 5% Significance Leve	
K-S Test Statistic	0.295	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.096	Detected Data Not Gamma Distributed at 5% Significance Leve	
Detected Data Not Gamma Distributed at 5% Significance Leve			

Gamma Statistics on Detected Data Only			
k hat (MLE)	0.341	k star (bias corrected MLE)	0.337
Theta hat (MLE)	1381	Theta star (bias corrected MLE)	1395
nu hat (MLE)	69.54	nu star (bias corrected)	68.83
Mean (detects)	470.7		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	428.7
Maximum	25000	Median	53
SD	2434	CV	5.679
k hat (MLE)	0.264	k star (bias corrected MLE)	0.263
Theta hat (MLE)	1626	Theta star (bias corrected MLE)	1633
nu hat (MLE)	59.05	nu star (bias corrected)	58.8
Adjusted Level of Significance (β)	0.0479		
Approximate Chi Square Value (58.80, α)	42.17	Adjusted Chi Square Value (58.80, β)	41.99
95% Gamma Approximate UCL (use when n>=50)	597.8	95% Gamma Adjusted UCL (use when n<50)	600.4

Estimates of Gamma Parameters using KM Estimates			
Mean (KM)	429.7	SD (KM)	2423
Variance (KM)	5872478	SE of Mean (KM)	230.1
k hat (KM)	0.0314	k star (KM)	0.0366
nu hat (KM)	7.044	nu star (KM)	8.189

APPENDIX B-1C1

PAHs in Soil - All Areas Except Zone 4

Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH diesel and motor oil in milligrams per kilogram (mg/kg)

theta hat (KM)	13665	theta star (KM)	11755
80% gamma percentile (KM)	15.21	90% gamma percentile (KM)	393.2
95% gamma percentile (KM)	1949	99% gamma percentile (KM)	10466

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (8.19, α)	2.845	Adjusted Chi Square Value (8.19, β)	2.804
95% Gamma Approximate KM-UCL (use when n>=50)	1237	95% Gamma Adjusted KM-UCL (use when n<50)	1255

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Approximate Test Statistic	0.965	Shapiro Wilk GOF Test	
5% Shapiro Wilk P Value	0.0531	Detected Data appear Lognormal at 5% Significance Leve	
Lilliefors Test Statistic	0.0957	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.088	Detected Data Not Lognormal at 5% Significance Leve	

Detected Data appear Approximate Lognormal at 5% Significance Leve

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	429.5	Mean in Log Scale	3.936
SD in Original Scale	2434	SD in Log Scale	1.752
95% t UCL (assumes normality of ROS data)	811	95% Percentile Bootstrap UCL	872.3
95% BCA Bootstrap UCL	1178	95% Bootstrap t UCL	2632
95% H-UCL (Log ROS)	392.4		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distributior

KM Mean (logged)	3.942	KM Geo Mean	51.5
KM SD (logged)	1.739	95% Critical H Value (KM-Log)	3.005
KM Standard Error of Mean (logged)	0.166	95% H-UCL (KM -Log)	383.3
KM SD (logged)	1.739	95% Critical H Value (KM-Log)	3.005
KM Standard Error of Mean (logged)	0.166		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	430.1	Mean in Log Scale	3.949
SD in Original Scale	2434	SD in Log Scale	1.77
95% t UCL (Assumes normality)	811.6	95% H-Stat UCL	414.1

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Approximate Lognormal Distributed at 5% Significance Leve

Suggested UCL to Use

KM H-UCL	383.3

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
Recommendations are based upon data size, data distribution, and skewness
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statisticiar

APPENDIX B-1C1
PAHs in Soil - All Areas Except Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH diesel and motor oil in milligrams per kilogram (mg/kg)

Pyrene

General Statistics			
Total Number of Observations	112	Number of Distinct Observations	84
Number of Detects	108	Number of Non-Detects	4
Number of Distinct Detects	81	Number of Distinct Non-Detects	4
Minimum Detect	2.3	Minimum Non-Detect	1.7
Maximum Detect	26000	Maximum Non-Detect	84
Variance Detects	8260390	Percent Non-Detects	3.57%
Mean Detects	663.2	SD Detects	2874
Median Detects	84	CV Detects	4.334
Skewness Detects	7.269	Kurtosis Detects	59.12
Mean of Logged Detects	4.52	SD of Logged Detects	1.743

Normal GOF Test on Detects Only			
Shapiro Wilk Test Statistic	0.244	Normal GOF Test on Detected Observations Only	
5% Shapiro Wilk P Value	0	Detected Data Not Normal at 5% Significance Leve	
Lilliefors Test Statistic	0.426	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.0855	Detected Data Not Normal at 5% Significance Leve	
Detected Data Not Normal at 5% Significance Leve			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
KM Mean	639.9	KM Standard Error of Mean	266.9
KM SD	2812	95% KM (BCA) UCL	1155
95% KM (t) UCL	1083	95% KM (Percentile Bootstrap) UCL	1128
95% KM (z) UCL	1079	95% KM Bootstrap t UCL	1936
90% KM Chebyshev UCL	1441	95% KM Chebyshev UCL	1803
97.5% KM Chebyshev UCL	2307	99% KM Chebyshev UCL	3296

Gamma GOF Tests on Detected Observations Only			
A-D Test Statistic	10.15	Anderson-Darling GOF Test	
5% A-D Critical Value	0.858	Detected Data Not Gamma Distributed at 5% Significance Leve	
K-S Test Statistic	0.24	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.0943	Detected Data Not Gamma Distributed at 5% Significance Leve	
Detected Data Not Gamma Distributed at 5% Significance Leve			

Gamma Statistics on Detected Data Only			
k hat (MLE)	0.341	k star (bias corrected MLE)	0.338
Theta hat (MLE)	1942	Theta star (bias corrected MLE)	1961
nu hat (MLE)	73.75	nu star (bias corrected)	73.04
Mean (detects)	663.2		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	639.5
Maximum	26000	Median	78.5
SD	2825	CV	4.417
k hat (MLE)	0.304	k star (bias corrected MLE)	0.301
Theta hat (MLE)	2106	Theta star (bias corrected MLE)	2121
nu hat (MLE)	68.01	nu star (bias corrected)	67.52
Adjusted Level of Significance (β)	0.0479		
Approximate Chi Square Value (67.52, α)	49.61	Adjusted Chi Square Value (67.52, β)	49.41
95% Gamma Approximate UCL (use when n>=50)	870.4	95% Gamma Adjusted UCL (use when n<50)	873.9

Estimates of Gamma Parameters using KM Estimates			
Mean (KM)	639.9	SD (KM)	2812
Variance (KM)	7906256	SE of Mean (KM)	266.9
k hat (KM)	0.0518	k star (KM)	0.0564
nu hat (KM)	11.6	nu star (KM)	12.62

APPENDIX B-1C1

PAHs in Soil - All Areas Except Zone 4

Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH diesel and motor oil in milligrams per kilogram (mg/kg)

theta hat (KM)	12356	theta star (KM)	11355
80% gamma percentile (KM)	128.6	90% gamma percentile (KM)	1127
95% gamma percentile (KM)	3532	99% gamma percentile (KM)	13257
Gamma Kaplan-Meier (KM) Statistics			
Approximate Chi Square Value (12.62, α)	5.641	Adjusted Chi Square Value (12.62, β)	5.58
95% Gamma Approximate KM-UCL (use when n>=50)	1432	95% Gamma Adjusted KM-UCL (use when n<50)	1448
Lognormal GOF Test on Detected Observations Only			
Shapiro Wilk Approximate Test Statistic	0.966	Shapiro Wilk GOF Test	
5% Shapiro Wilk P Value	0.0608	Detected Data appear Lognormal at 5% Significance Leve	
Lilliefors Test Statistic	0.0707	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.0855	Detected Data appear Lognormal at 5% Significance Leve	
Detected Data appear Lognormal at 5% Significance Leve			
Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	639.8	Mean in Log Scale	4.412
SD in Original Scale	2824	SD in Log Scale	1.817
95% t UCL (assumes normality of ROS data)	1082	95% Percentile Bootstrap UCL	1143
95% BCA Bootstrap UCL	1423	95% Bootstrap t UCL	1749
95% H-UCL (Log ROS)	732.6		
Statistics using KM estimates on Logged Data and Assuming Lognormal Distributior			
KM Mean (logged)	4.415	KM Geo Mean	82.71
KM SD (logged)	1.802	95% Critical H Value (KM-Log)	3.08
KM Standard Error of Mean (logged)	0.171	95% H-UCL (KM -Log)	709.8
KM SD (logged)	1.802	95% Critical H Value (KM-Log)	3.08
KM Standard Error of Mean (logged)	0.171		
DL/2 Statistics			
DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	640	Mean in Log Scale	4.415
SD in Original Scale	2824	SD in Log Scale	1.818
95% t UCL (Assumes normality)	1083	95% H-Stat UCL	737.3
DL/2 is not a recommended method, provided for comparisons and historical reasons			
Nonparametric Distribution Free UCL Statistics			
Detected Data appear Lognormal Distributed at 5% Significance Leve			
Suggested UCL to Use			
KM H-UCL	709.8		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
Recommendations are based upon data size, data distribution, and skewness
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statisticiar

APPENDIX B-1C1

PAHs in Soil - All Areas Except Zone 4

Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH diesel and motor oil in milligrams per kilogram (mg/kg)

TPH-Diesel (C10-C28)

General Statistics			
Total Number of Observations	112	Number of Distinct Observations	84
		Number of Missing Observations	0
Minimum	1.5	Mean	219.8
Maximum	3600	Median	62
SD	448.3	Std. Error of Mean	42.36
Coefficient of Variation	2.04	Skewness	4.846
Normal GOF Test			
Shapiro Wilk Test Statistic	0.511	Shapiro Wilk GOF Test	
5% Shapiro Wilk P Value	0	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.313	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.084	Data Not Normal at 5% Significance Level	
Data Not Normal at 5% Significance Level			
Assuming Normal Distribution			
95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	290	95% Adjusted-CLT UCL (Chen-1995)	310.2
		95% Modified-t UCL (Johnson-1978)	293.2
Gamma GOF Test			
A-D Test Statistic	3.263	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.816	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.171	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.0912	Data Not Gamma Distributed at 5% Significance Level	
Data Not Gamma Distributed at 5% Significance Level			
Gamma Statistics			
k hat (MLE)	0.527	k star (bias corrected MLE)	0.519
Theta hat (MLE)	417.1	Theta star (bias corrected MLE)	423.7
nu hat (MLE)	118	nu star (bias corrected)	116.2
MLE Mean (bias corrected)	219.8	MLE Sd (bias corrected)	305.1
		Approximate Chi Square Value (0.05)	92.3
Adjusted Level of Significance	0.0479	Adjusted Chi Square Value	92.02
Assuming Gamma Distribution			
95% Approximate Gamma UCL (use when n>=50))	276.6	95% Adjusted Gamma UCL (use when n<50)	277.5
Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.98	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk P Value	0.485	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.0604	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.084	Data appear Lognormal at 5% Significance Level	
Data appear Lognormal at 5% Significance Level			
Lognormal Statistics			
Minimum of Logged Data	0.405	Mean of logged Data	4.197
Maximum of Logged Data	8.189	SD of logged Data	1.607
Assuming Lognormal Distribution			
95% H-UCL	373.5	90% Chebyshev (MVUE) UCL	389.8
95% Chebyshev (MVUE) UCL	459.7	97.5% Chebyshev (MVUE) UCL	556.6
99% Chebyshev (MVUE) UCL	747.1		
Nonparametric Distribution Free UCL Statistics			
Data appear to follow a Discernible Distribution at 5% Significance Leve			
Nonparametric Distribution Free UCLs			
95% CLT UCL	289.4	95% Jackknife UCL	290
95% Standard Bootstrap UCL	289.3	95% Bootstrap-t UCL	324.5
95% Hall's Bootstrap UCL	379.5	95% Percentile Bootstrap UCL	294.5

APPENDIX B-1C1

PAHs in Soil - All Areas Except Zone 4

Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH diesel and motor oil in milligrams per kilogram (mg/kg)

95% BCA Bootstrap UCL	317.3		
90% Chebyshev(Mean, Sd) UCL	346.8	95% Chebyshev(Mean, Sd) UCL	404.4
97.5% Chebyshev(Mean, Sd) UCL	484.3	99% Chebyshev(Mean, Sd) UCL	641.2

Suggested UCL to Use

95% H-UCL 373.5

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
Recommendations are based upon data size, data distribution, and skewness
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statisticiar

ProUCL computes and outputs H-statistic based UCLs for historical reasons only
H-statistic often results in unstable (both high and low) values of UCL95 as shown in examples in the Technical Guide
It is therefore recommended to avoid the use of H-statistic based 95% UCLs
Use of nonparametric methods are preferred to compute UCL95 for skewed data sets which do not follow a gamma distribution

APPENDIX B-1C1
PAHs in Soil - All Areas Except Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH diesel and motor oil in milligrams per kilogram (mg/kg)

TPH-Motor Oil (C24-C36)

General Statistics

Total Number of Observations	112	Number of Distinct Observations	74
Number of Detects	111	Number of Non-Detects	1
Number of Distinct Detects	73	Number of Distinct Non-Detects	1
Minimum Detect	5.2	Minimum Non-Detect	10
Maximum Detect	4900	Maximum Non-Detect	10
Variance Detects	652464	Percent Non-Detects	0.89%
Mean Detects	460.7	SD Detects	807.8
Median Detects	150	CV Detects	1.753
Skewness Detects	3.014	Kurtosis Detects	10.32
Mean of Logged Detects	4.998	SD of Logged Detects	1.576

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.592	Normal GOF Test on Detected Observations Only	
5% Shapiro Wilk P Value	0	Detected Data Not Normal at 5% Significance Leve	
Lilliefors Test Statistic	0.286	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.0844	Detected Data Not Normal at 5% Significance Leve	
Detected Data Not Normal at 5% Significance Leve			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	456.6	KM Standard Error of Mean	76.09
KM SD	801.7	95% KM (BCA) UCL	597.2
95% KM (t) UCL	582.8	95% KM (Percentile Bootstrap) UCL	583.8
95% KM (z) UCL	581.8	95% KM Bootstrap t UCL	619
90% KM Chebyshev UCL	684.9	95% KM Chebyshev UCL	788.3
97.5% KM Chebyshev UCL	931.8	99% KM Chebyshev UCL	1214

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	3.145	Anderson-Darling GOF Test	
5% A-D Critical Value	0.814	Detected Data Not Gamma Distributed at 5% Significance Leve	
K-S Test Statistic	0.165	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.0913	Detected Data Not Gamma Distributed at 5% Significance Leve	
Detected Data Not Gamma Distributed at 5% Significance Leve			

Gamma Statistics on Detected Data Only

k hat (MLE)	0.551	k star (bias corrected MLE)	0.543
Theta hat (MLE)	835.4	Theta star (bias corrected MLE)	849.1
nu hat (MLE)	122.4	nu star (bias corrected)	120.4
Mean (detects)	460.7		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	456.6
Maximum	4900	Median	150
SD	805.3	CV	1.764
k hat (MLE)	0.521	k star (bias corrected MLE)	0.513
Theta hat (MLE)	876.3	Theta star (bias corrected MLE)	890
nu hat (MLE)	116.7	nu star (bias corrected)	114.9
Adjusted Level of Significance (β)	0.0479		
Approximate Chi Square Value (114.91, α)	91.16	Adjusted Chi Square Value (114.91, β)	90.89
95% Gamma Approximate UCL (use when n>=50)	575.5	95% Gamma Adjusted UCL (use when n<50)	577.2

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	456.6	SD (KM)	801.7
Variance (KM)	642643	SE of Mean (KM)	76.09
k hat (KM)	0.324	k star (KM)	0.322
nu hat (KM)	72.67	nu star (KM)	72.06

APPENDIX B-1C1

PAHs in Soil - All Areas Except Zone 4

Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH diesel and motor oil in milligrams per kilogram (mg/kg)

theta hat (KM)	1407	theta star (KM)	1419
80% gamma percentile (KM)	711.5	90% gamma percentile (KM)	1335
95% gamma percentile (KM)	2042	99% gamma percentile (KM)	3864

Gamma Kaplan-Meier (KM) Statistics			
Approximate Chi Square Value (72.06, α)	53.51	Adjusted Chi Square Value (72.06, β)	53.31
95% Gamma Approximate KM-UCL (use when n>=50)	614.9	95% Gamma Adjusted KM-UCL (use when n<50)	617.2

Lognormal GOF Test on Detected Observations Only			
Shapiro Wilk Approximate Test Statistic	0.968	Shapiro Wilk GOF Test	
5% Shapiro Wilk P Value	0.0815	Detected Data appear Lognormal at 5% Significance Leve	
Lilliefors Test Statistic	0.0585	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.0844	Detected Data appear Lognormal at 5% Significance Leve	
Detected Data appear Lognormal at 5% Significance Leve			

Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	456.6	Mean in Log Scale	4.965
SD in Original Scale	805.3	SD in Log Scale	1.606
95% t UCL (assumes normality of ROS data)	582.8	95% Percentile Bootstrap UCL	584.9
95% BCA Bootstrap UCL	617.4	95% Bootstrap t UCL	615.8
95% H-UCL (Log ROS)	804.5		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distributior			
KM Mean (logged)	4.969	KM Geo Mean	143.9
KM SD (logged)	1.591	95% Critical H Value (KM-Log)	2.833
KM Standard Error of Mean (logged)	0.151	95% H-UCL (KM -Log)	782.6
KM SD (logged)	1.591	95% Critical H Value (KM-Log)	2.833
KM Standard Error of Mean (logged)	0.151		

DL/2 Statistics			
DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	456.6	Mean in Log Scale	4.968
SD in Original Scale	805.3	SD in Log Scale	1.601
95% t UCL (Assumes normality)	582.8	95% H-Stat UCL	797.5
DL/2 is not a recommended method, provided for comparisons and historical reasons			

Nonparametric Distribution Free UCL Statistics	
Detected Data appear Lognormal Distributed at 5% Significance Leve	

Suggested UCL to Use	
KM H-UCL	782.6

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
Recommendations are based upon data size, data distribution, and skewness
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statisticiar

APPENDIX B-1C2

PAHs in Soil - Zone 4

Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH diesel and motor oil in milligrams per kilogram (mg/kg)

2-Methylnaphthalene

General Statistics

Total Number of Observations	26	Number of Distinct Observations	19
Number of Detects	3	Number of Non-Detects	23
Number of Distinct Detects	3	Number of Distinct Non-Detects	16
Minimum Detect	110	Minimum Non-Detect	4.9
Maximum Detect	1700	Maximum Non-Detect	2400
Variance Detects	674033	Percent Non-Detects	88.46%
Mean Detects	786.7	SD Detects	821
Median Detects	550	CV Detects	1.044
Skewness Detects	1.189	Kurtosis Detects	N/A
Mean of Logged Detects	6.15	SD of Logged Detects	1.376

Warning: Data set has only 3 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.938	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Normal at 5% Significance Leve	
Lilliefors Test Statistic	0.28	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.425	Detected Data appear Normal at 5% Significance Leve	

Detected Data appear Normal at 5% Significance Leve

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	105.2	KM Standard Error of Mean	85.12
KM SD	344.6	95% KM (BCA) UCL	N/A
95% KM (t) UCL	250.6	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	245.2	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	360.6	95% KM Chebyshev UCL	476.3
97.5% KM Chebyshev UCL	636.8	99% KM Chebyshev UCL	952.1

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	1.102	k star (bias corrected MLE)	N/A
Theta hat (MLE)	714.1	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	6.61	nu star (bias corrected)	N/A
Mean (detects)	786.7		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	90.78
Maximum	1700	Median	0.01
SD	345.9	CV	3.81
k hat (MLE)	0.103	k star (bias corrected MLE)	0.117
Theta hat (MLE)	883.1	Theta star (bias corrected MLE)	778.7
nu hat (MLE)	5.345	nu star (bias corrected)	6.062
Adjusted Level of Significance (β)	0.0398		
Approximate Chi Square Value (6.06, α)	1.672	Adjusted Chi Square Value (6.06, β)	1.525
95% Gamma Approximate UCL (use when n>=50)	329.2	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	105.2	SD (KM)	344.6
Variance (KM)	118751	SE of Mean (KM)	85.12
k hat (KM)	0.0933	k star (KM)	0.108
nu hat (KM)	4.85	nu star (KM)	5.624

APPENDIX B-1C2

PAHs in Soil - Zone 4

Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH diesel and motor oil in milligrams per kilogram (mg/kg)

theta hat (KM)	1128	theta star (KM)	973.1
80% gamma percentile (KM)	81.35	90% gamma percentile (KM)	288.7
95% gamma percentile (KM)	607.4	99% gamma percentile (KM)	1607

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (5.62, α)	1.451	Adjusted Chi Square Value (5.62, β)	1.317
95% Gamma Approximate KM-UCL (use when n>=50)	408	95% Gamma Adjusted KM-UCL (use when n<50)	449.5

95% Gamma Adjusted KM-UCL (use when k<=1 and 15 < n < 50)

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.99	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Lognormal at 5% Significance Leve	
Lilliefors Test Statistic	0.213	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.425	Detected Data appear Lognormal at 5% Significance Leve	

Detected Data appear Lognormal at 5% Significance Leve

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	94.57	Mean in Log Scale	1.585
SD in Original Scale	344.8	SD in Log Scale	1.963
95% t UCL (assumes normality of ROS data)	210.1	95% Percentile Bootstrap UCL	222.1
95% BCA Bootstrap UCL	312.5	95% Bootstrap t UCL	1508
95% H-UCL (Log ROS)	157.7		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distributior

KM Mean (logged)	2.288	KM Geo Mean	9.859
KM SD (logged)	1.63	95% Critical H Value (KM-Log)	3.417
KM Standard Error of Mean (logged)	0.46	95% H-UCL (KM -Log)	113.5
KM SD (logged)	1.63	95% Critical H Value (KM-Log)	3.417
KM Standard Error of Mean (logged)	0.46		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	241.2	Mean in Log Scale	4.402
SD in Original Scale	394.5	SD in Log Scale	1.668
95% t UCL (Assumes normality)	373.3	95% H-Stat UCL	1044

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Normal Distributed at 5% Significance Leve

Suggested UCL to Use

95% KM (t) UCL	250.6

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
Recommendations are based upon data size, data distribution, and skewness
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statisticiar

APPENDIX B-1C2
PAHs in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH diesel and motor oil in milligrams per kilogram (mg/kg)

Acenaphthene

General Statistics

Total Number of Observations	26	Number of Distinct Observations	17
Number of Detects	3	Number of Non-Detects	23
Number of Distinct Detects	3	Number of Distinct Non-Detects	15
Minimum Detect	28	Minimum Non-Detect	2.8
Maximum Detect	2700	Maximum Non-Detect	1400
Variance Detects	2292481	Percent Non-Detects	88.46%
Mean Detects	952.7	SD Detects	1514
Median Detects	130	CV Detects	1.589
Skewness Detects	1.723	Kurtosis Detects	N/A
Mean of Logged Detects	5.367	SD of Logged Detects	2.325

Warning: Data set has only 3 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.779	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Normal at 5% Significance Leve	
Lilliefors Test Statistic	0.373	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.425	Detected Data appear Normal at 5% Significance Leve	

Detected Data appear Normal at 5% Significance Leve

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	118	KM Standard Error of Mean	124.4
KM SD	517.3	95% KM (BCA) UCL	N/A
95% KM (t) UCL	330.5	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	322.6	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	491.2	95% KM Chebyshev UCL	660.3
97.5% KM Chebyshev UCL	895	99% KM Chebyshev UCL	1356

Gamma GOF Tests on Detected Observations Only
Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	0.435	k star (bias corrected MLE)	N/A
Theta hat (MLE)	2190	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	2.61	nu star (bias corrected)	N/A
Mean (detects)	952.7		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	109.9
Maximum	2700	Median	0.01
SD	528.9	CV	4.811
k hat (MLE)	0.0996	k star (bias corrected MLE)	0.114
Theta hat (MLE)	1103	Theta star (bias corrected MLE)	966.2
nu hat (MLE)	5.181	nu star (bias corrected)	5.917
Adjusted Level of Significance (β)	0.0398		
Approximate Chi Square Value (5.92, α)	1.597	Adjusted Chi Square Value (5.92, β)	1.455
95% Gamma Approximate UCL (use when n>=50)	407.2	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	118	SD (KM)	517.3
Variance (KM)	267607	SE of Mean (KM)	124.4
k hat (KM)	0.052	k star (KM)	0.0716
nu hat (KM)	2.704	nu star (KM)	3.726

APPENDIX B-1C2

PAHs in Soil - Zone 4

Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH diesel and motor oil in milligrams per kilogram (mg/kg)

theta hat (KM)	2268	theta star (KM)	1647
80% gamma percentile (KM)	44.55	90% gamma percentile (KM)	259.2
95% gamma percentile (KM)	680.3	99% gamma percentile (KM)	2200

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (3.73, α)	0.616	Adjusted Chi Square Value (3.73, β)	0.542
95% Gamma Approximate KM-UCL (use when n>=50)	713.1	95% Gamma Adjusted KM-UCL (use when n<50)	810.5

95% Gamma Adjusted KM-UCL (use when k<=1 and 15 < n < 50)

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.965	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Lognormal at 5% Significance Leve	
Lilliefors Test Statistic	0.252	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.425	Detected Data appear Lognormal at 5% Significance Leve	

Detected Data appear Lognormal at 5% Significance Leve

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	110.6	Mean in Log Scale	-0.523
SD in Original Scale	528.8	SD in Log Scale	2.665
95% t UCL (assumes normality of ROS data)	287.7	95% Percentile Bootstrap UCL	313.4
95% BCA Bootstrap UCL	430.9	95% Bootstrap t UCL	10729
95% H-UCL (Log ROS)	316.8		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distributior

KM Mean (logged)	1.87	KM Geo Mean	6.491
KM SD (logged)	1.671	95% Critical H Value (KM-Log)	3.48
KM Standard Error of Mean (logged)	0.542	95% H-UCL (KM -Log)	83.79
KM SD (logged)	1.671	95% Critical H Value (KM-Log)	3.48
KM Standard Error of Mean (logged)	0.542		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	195.9	Mean in Log Scale	3.851
SD in Original Scale	530.7	SD in Log Scale	1.685
95% t UCL (Assumes normality)	373.6	95% H-Stat UCL	632.5

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Normal Distributed at 5% Significance Leve

Suggested UCL to Use

95% KM (t) UCL	330.5

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
Recommendations are based upon data size, data distribution, and skewness
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statisticiar

APPENDIX B-1C2
PAHs in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH diesel and motor oil in milligrams per kilogram (mg/kg)

Acenaphthylene

General Statistics

Total Number of Observations	26	Number of Distinct Observations	20
Number of Detects	3	Number of Non-Detects	23
Number of Distinct Detects	3	Number of Distinct Non-Detects	17
Minimum Detect	7	Minimum Non-Detect	2.4
Maximum Detect	580	Maximum Non-Detect	1200
Variance Detects	89936	Percent Non-Detects	88.46%
Mean Detects	242.3	SD Detects	299.9
Median Detects	140	CV Detects	1.238
Skewness Detects	1.357	Kurtosis Detects	N/A
Mean of Logged Detects	4.417	SD of Logged Detects	2.255

Warning: Data set has only 3 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.913	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Normal at 5% Significance Leve	
Lilliefors Test Statistic	0.3	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.425	Detected Data appear Normal at 5% Significance Leve	

Detected Data appear Normal at 5% Significance Leve

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	33.85	KM Standard Error of Mean	28.54
KM SD	115.4	95% KM (BCA) UCL	N/A
95% KM (t) UCL	82.61	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	80.8	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	119.5	95% KM Chebyshev UCL	158.3
97.5% KM Chebyshev UCL	212.1	99% KM Chebyshev UCL	317.9

Gamma GOF Tests on Detected Observations Only
Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	0.579	k star (bias corrected MLE)	N/A
Theta hat (MLE)	418.8	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	3.472	nu star (bias corrected)	N/A
Mean (detects)	242.3		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	27.97
Maximum	580	Median	0.01
SD	115.9	CV	4.143
k hat (MLE)	0.116	k star (bias corrected MLE)	0.128
Theta hat (MLE)	242	Theta star (bias corrected MLE)	218.7
nu hat (MLE)	6.011	nu star (bias corrected)	6.65
Adjusted Level of Significance (β)	0.0398		
Approximate Chi Square Value (6.65, α)	1.981	Adjusted Chi Square Value (6.65, β)	1.817
95% Gamma Approximate UCL (use when n>=50)	93.91	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	33.85	SD (KM)	115.4
Variance (KM)	13319	SE of Mean (KM)	28.54
k hat (KM)	0.086	k star (KM)	0.102
nu hat (KM)	4.474	nu star (KM)	5.291

APPENDIX B-1C2

PAHs in Soil - Zone 4

Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH diesel and motor oil in milligrams per kilogram (mg/kg)

theta hat (KM)	393.5	theta star (KM)	332.7
80% gamma percentile (KM)	24.08	90% gamma percentile (KM)	90.74
95% gamma percentile (KM)	196.3	99% gamma percentile (KM)	533.1

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (5.29, α)	1.289	Adjusted Chi Square Value (5.29, β)	1.165
95% Gamma Approximate KM-UCL (use when n>=50)	139	95% Gamma Adjusted KM-UCL (use when n<50)	153.8

95% Gamma Adjusted KM-UCL (use when k<=1 and 15 < n < 50)

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.959	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Lognormal at 5% Significance Leve	
Lilliefors Test Statistic	0.259	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.425	Detected Data appear Lognormal at 5% Significance Leve	

Detected Data appear Lognormal at 5% Significance Leve

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	28.69	Mean in Log Scale	-0.12
SD in Original Scale	115.7	SD in Log Scale	2.055
95% t UCL (assumes normality of ROS data)	67.45	95% Percentile Bootstrap UCL	68.39
95% BCA Bootstrap UCL	106.5	95% Bootstrap t UCL	2213
95% H-UCL (Log ROS)	39.46		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distributior

KM Mean (logged)	1.625	KM Geo Mean	5.078
KM SD (logged)	1.351	95% Critical H Value (KM-Log)	2.993
KM Standard Error of Mean (logged)	0.46	95% H-UCL (KM -Log)	28.4
KM SD (logged)	1.351	95% Critical H Value (KM-Log)	2.993
KM Standard Error of Mean (logged)	0.46		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	103.6	Mean in Log Scale	3.696
SD in Original Scale	157	SD in Log Scale	1.549
95% t UCL (Assumes normality)	156.2	95% H-Stat UCL	371

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Normal Distributed at 5% Significance Leve

Suggested UCL to Use

95% KM (t) UCL	82.61

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL

Recommendations are based upon data size, data distribution, and skewness

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statisticiar

APPENDIX B-1C2

PAHs in Soil - Zone 4

Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH diesel and motor oil in milligrams per kilogram (mg/kg)

Anthracene

General Statistics			
Total Number of Observations	26	Number of Distinct Observations	24
Number of Detects	15	Number of Non-Detects	11
Number of Distinct Detects	14	Number of Distinct Non-Detects	10
Minimum Detect	4.1	Minimum Non-Detect	2
Maximum Detect	2900	Maximum Non-Detect	980
Variance Detects	534876	Percent Non-Detects	42.31%
Mean Detects	269.8	SD Detects	731.4
Median Detects	55	CV Detects	2.71
Skewness Detects	3.806	Kurtosis Detects	14.62
Mean of Logged Detects	4.176	SD of Logged Detects	1.547

Normal GOF Test on Detects Only		
Shapiro Wilk Test Statistic	0.368	Shapiro Wilk GOF Test
5% Shapiro Wilk Critical Value	0.881	Detected Data Not Normal at 5% Significance Leve
Lilliefors Test Statistic	0.439	Lilliefors GOF Test
5% Lilliefors Critical Value	0.22	Detected Data Not Normal at 5% Significance Leve
Detected Data Not Normal at 5% Significance Leve		

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
KM Mean	171.2	KM Standard Error of Mean	111.8
KM SD	549.7	95% KM (BCA) UCL	392.6
95% KM (t) UCL	362.1	95% KM (Percentile Bootstrap) UCL	384.5
95% KM (z) UCL	355	95% KM Bootstrap t UCL	1394
90% KM Chebyshev UCL	506.5	95% KM Chebyshev UCL	658.3
97.5% KM Chebyshev UCL	869.1	99% KM Chebyshev UCL	1283

Gamma GOF Tests on Detected Observations Only		
A-D Test Statistic	1.463	Anderson-Darling GOF Test
5% A-D Critical Value	0.803	Detected Data Not Gamma Distributed at 5% Significance Leve
K-S Test Statistic	0.254	Kolmogorov-Smirnov GOF
5% K-S Critical Value	0.235	Detected Data Not Gamma Distributed at 5% Significance Leve
Detected Data Not Gamma Distributed at 5% Significance Leve		

Gamma Statistics on Detected Data Only			
k hat (MLE)	0.454	k star (bias corrected MLE)	0.407
Theta hat (MLE)	594.9	Theta star (bias corrected MLE)	662.5
nu hat (MLE)	13.61	nu star (bias corrected)	12.22
Mean (detects)	269.8		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	155.7
Maximum	2900	Median	13.3
SD	563.9	CV	3.622
k hat (MLE)	0.165	k star (bias corrected MLE)	0.172
Theta hat (MLE)	942.4	Theta star (bias corrected MLE)	906.3
nu hat (MLE)	8.59	nu star (bias corrected)	8.932
Adjusted Level of Significance (β)	0.0398		
Approximate Chi Square Value (8.93, α)	3.286	Adjusted Chi Square Value (8.93, β)	3.063
95% Gamma Approximate UCL (use when n>=50)	423.2	95% Gamma Adjusted UCL (use when n<50)	454

Estimates of Gamma Parameters using KM Estimates			
Mean (KM)	171.2	SD (KM)	549.7
Variance (KM)	302173	SE of Mean (KM)	111.8
k hat (KM)	0.097	k star (KM)	0.111
nu hat (KM)	5.042	nu star (KM)	5.794

APPENDIX B-1C2

PAHs in Soil - Zone 4

Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH diesel and motor oil in milligrams per kilogram (mg/kg)

theta hat (KM)	1765	theta star (KM)	1536
80% gamma percentile (KM)	137.4	90% gamma percentile (KM)	474.2
95% gamma percentile (KM)	985	99% gamma percentile (KM)	2574

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (5.79, α)	1.535	Adjusted Chi Square Value (5.79, β)	1.396
95% Gamma Approximate KM-UCL (use when n>=50)	645.9	95% Gamma Adjusted KM-UCL (use when n<50)	710.3

95% Gamma Adjusted KM-UCL (use when k<=1 and 15 < n < 50)

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.957	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.881	Detected Data appear Lognormal at 5% Significance Leve	
Lilliefors Test Statistic	0.119	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.22	Detected Data appear Lognormal at 5% Significance Leve	

Detected Data appear Lognormal at 5% Significance Leve

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	165.1	Mean in Log Scale	3.615
SD in Original Scale	561.4	SD in Log Scale	1.45
95% t UCL (assumes normality of ROS data)	353.2	95% Percentile Bootstrap UCL	380.8
95% BCA Bootstrap UCL	510.6	95% Bootstrap t UCL	1727
95% H-UCL (Log ROS)	264.3		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distributior

KM Mean (logged)	3.596	KM Geo Mean	36.46
KM SD (logged)	1.605	95% Critical H Value (KM-Log)	3.378
KM Standard Error of Mean (logged)	0.384	95% H-UCL (KM -Log)	391.4
KM SD (logged)	1.605	95% Critical H Value (KM-Log)	3.378
KM Standard Error of Mean (logged)	0.384		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	204.3	Mean in Log Scale	4.079
SD in Original Scale	560	SD in Log Scale	1.56
95% t UCL (Assumes normality)	391.9	95% H-Stat UCL	560

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Lognormal Distributed at 5% Significance Leve

Suggested UCL to Use

95% KM (Chebyshev) UCL	658.3

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL

Recommendations are based upon data size, data distribution, and skewness

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statisticiar

APPENDIX B-1C2

PAHs in Soil - Zone 4

Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH diesel and motor oil in milligrams per kilogram (mg/kg)

Benzo(a)anthracene

General Statistics			
Total Number of Observations	26	Number of Distinct Observations	20
Number of Detects	10	Number of Non-Detects	16
Number of Distinct Detects	10	Number of Distinct Non-Detects	10
Minimum Detect	20	Minimum Non-Detect	1.5
Maximum Detect	1300	Maximum Non-Detect	730
Variance Detects	152535	Percent Non-Detects	61.54%
Mean Detects	211.5	SD Detects	390.6
Median Detects	64.5	CV Detects	1.847
Skewness Detects	2.935	Kurtosis Detects	8.878
Mean of Logged Detects	4.482	SD of Logged Detects	1.222

Normal GOF Test on Detects Only			
Shapiro Wilk Test Statistic	0.522	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.842	Detected Data Not Normal at 5% Significance Leve	
Lilliefors Test Statistic	0.361	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.262	Detected Data Not Normal at 5% Significance Leve	
Detected Data Not Normal at 5% Significance Leve			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
KM Mean	94.61	KM Standard Error of Mean	51.89
KM SD	249.2	95% KM (BCA) UCL	196.3
95% KM (t) UCL	183.2	95% KM (Percentile Bootstrap) UCL	189.7
95% KM (z) UCL	180	95% KM Bootstrap t UCL	394.5
90% KM Chebyshev UCL	250.3	95% KM Chebyshev UCL	320.8
97.5% KM Chebyshev UCL	418.7	99% KM Chebyshev UCL	610.9

Gamma GOF Tests on Detected Observations Only			
A-D Test Statistic	1.076	Anderson-Darling GOF Test	
5% A-D Critical Value	0.761	Detected Data Not Gamma Distributed at 5% Significance Leve	
K-S Test Statistic	0.322	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.277	Detected Data Not Gamma Distributed at 5% Significance Leve	
Detected Data Not Gamma Distributed at 5% Significance Leve			

Gamma Statistics on Detected Data Only			
k hat (MLE)	0.694	k star (bias corrected MLE)	0.552
Theta hat (MLE)	304.9	Theta star (bias corrected MLE)	383
nu hat (MLE)	13.87	nu star (bias corrected)	11.05
Mean (detects)	211.5		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	81.35
Maximum	1300	Median	0.01
SD	256.8	CV	3.156
k hat (MLE)	0.141	k star (bias corrected MLE)	0.15
Theta hat (MLE)	577.8	Theta star (bias corrected MLE)	541.7
nu hat (MLE)	7.321	nu star (bias corrected)	7.81
Adjusted Level of Significance (β)	0.0398		
Approximate Chi Square Value (7.81, α)	2.625	Adjusted Chi Square Value (7.81, β)	2.431
95% Gamma Approximate UCL (use when n>=50)	242	95% Gamma Adjusted UCL (use when n<50)	261.4

Estimates of Gamma Parameters using KM Estimates			
Mean (KM)	94.61	SD (KM)	249.2
Variance (KM)	62110	SE of Mean (KM)	51.89
k hat (KM)	0.144	k star (KM)	0.153
nu hat (KM)	7.494	nu star (KM)	7.963

APPENDIX B-1C2

PAHs in Soil - Zone 4

Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH diesel and motor oil in milligrams per kilogram (mg/kg)

theta hat (KM)	656.5	theta star (KM)	617.8
80% gamma percentile (KM)	104.7	90% gamma percentile (KM)	281.3
95% gamma percentile (KM)	518.6	99% gamma percentile (KM)	1204
Gamma Kaplan-Meier (KM) Statistics			
Approximate Chi Square Value (7.96, α)	2.714	Adjusted Chi Square Value (7.96, β)	2.515
95% Gamma Approximate KM-UCL (use when n>=50)	277.6	95% Gamma Adjusted KM-UCL (use when n<50)	299.6
Lognormal GOF Test on Detected Observations Only			
Shapiro Wilk Test Statistic	0.885	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.842	Detected Data appear Lognormal at 5% Significance Leve	
Lilliefors Test Statistic	0.254	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.262	Detected Data appear Lognormal at 5% Significance Leve	
Detected Data appear Lognormal at 5% Significance Leve			
Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	91.59	Mean in Log Scale	3.277
SD in Original Scale	253.7	SD in Log Scale	1.358
95% t UCL (assumes normality of ROS data)	176.6	95% Percentile Bootstrap UCL	186.9
95% BCA Bootstrap UCL	240.1	95% Bootstrap t UCL	474.7
95% H-UCL (Log ROS)	150.5		
Statistics using KM estimates on Logged Data and Assuming Lognormal Distributior			
KM Mean (logged)	2.856	KM Geo Mean	17.4
KM SD (logged)	1.964	95% Critical H Value (KM-Log)	3.948
KM Standard Error of Mean (logged)	0.537	95% H-UCL (KM -Log)	564.4
KM SD (logged)	1.964	95% Critical H Value (KM-Log)	3.948
KM Standard Error of Mean (logged)	0.537		
DL/2 Statistics			
DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	122.2	Mean in Log Scale	3.783
SD in Original Scale	255.3	SD in Log Scale	1.543
95% t UCL (Assumes normality)	207.7	95% H-Stat UCL	397.9
DL/2 is not a recommended method, provided for comparisons and historical reasons			
Nonparametric Distribution Free UCL Statistics			
Detected Data appear Lognormal Distributed at 5% Significance Leve			
Suggested UCL to Use			
KM H-UCL	564.4		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
Recommendations are based upon data size, data distribution, and skewness
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statisticiar

APPENDIX B-1C2

PAHs in Soil - Zone 4

Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH diesel and motor oil in milligrams per kilogram (mg/kg)

Benzo(a)pyrene

General Statistics			
Total Number of Observations	26	Number of Distinct Observations	24
Number of Detects	23	Number of Non-Detects	3
Number of Distinct Detects	21	Number of Distinct Non-Detects	3
Minimum Detect	3.1	Minimum Non-Detect	40
Maximum Detect	990	Maximum Non-Detect	930
Variance Detects	91686	Percent Non-Detects	11.54%
Mean Detects	297.5	SD Detects	302.8
Median Detects	180	CV Detects	1.018
Skewness Detects	1.195	Kurtosis Detects	0.432
Mean of Logged Detects	4.992	SD of Logged Detects	1.485

Normal GOF Test on Detects Only			
Shapiro Wilk Test Statistic	0.835	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.914	Detected Data Not Normal at 5% Significance Leve	
Lilliefors Test Statistic	0.215	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.18	Detected Data Not Normal at 5% Significance Leve	
Detected Data Not Normal at 5% Significance Leve			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
KM Mean	273.1	KM Standard Error of Mean	59.09
KM SD	291.4	95% KM (BCA) UCL	379.8
95% KM (t) UCL	374	95% KM (Percentile Bootstrap) UCL	373.7
95% KM (z) UCL	370.3	95% KM Bootstrap t UCL	394.6
90% KM Chebyshev UCL	450.3	95% KM Chebyshev UCL	530.6
97.5% KM Chebyshev UCL	642.1	99% KM Chebyshev UCL	861

Gamma GOF Tests on Detected Observations Only			
A-D Test Statistic	0.196	Anderson-Darling GOF Test	
5% A-D Critical Value	0.778	Detected data appear Gamma Distributed at 5% Significance Leve	
K-S Test Statistic	0.0891	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.188	Detected data appear Gamma Distributed at 5% Significance Leve	
Detected data appear Gamma Distributed at 5% Significance Leve			

Gamma Statistics on Detected Data Only			
k hat (MLE)	0.838	k star (bias corrected MLE)	0.758
Theta hat (MLE)	354.8	Theta star (bias corrected MLE)	392.5
nu hat (MLE)	38.57	nu star (bias corrected)	34.87
Mean (detects)	297.5		

Gamma ROS Statistics using Imputed Non-Detects			
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs			
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20			
For such situations, GROS method may yield incorrect values of UCLs and BTVs			
This is especially true when the sample size is small.			
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates			
Minimum	3.1	Mean	270.6
Maximum	990	Median	142.8
SD	294.9	CV	1.09
k hat (MLE)	0.765	k star (bias corrected MLE)	0.702
Theta hat (MLE)	353.9	Theta star (bias corrected MLE)	385.4
nu hat (MLE)	39.76	nu star (bias corrected)	36.51
Adjusted Level of Significance (β)	0.0398		
Approximate Chi Square Value (36.51, α)	23.68	Adjusted Chi Square Value (36.51, β)	22.99
95% Gamma Approximate UCL (use when n>=50)	417.2	95% Gamma Adjusted UCL (use when n<50)	429.6

Estimates of Gamma Parameters using KM Estimates			
Mean (KM)	273.1	SD (KM)	291.4
Variance (KM)	84929	SE of Mean (KM)	59.09
k hat (KM)	0.878	k star (KM)	0.802
nu hat (KM)	45.65	nu star (KM)	41.72

APPENDIX B-1C2

PAHs in Soil - Zone 4

Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH diesel and motor oil in milligrams per kilogram (mg/kg)

theta hat (KM)	311	theta star (KM)	340.3
80% gamma percentile (KM)	446.2	90% gamma percentile (KM)	663.5
95% gamma percentile (KM)	884.9	99% gamma percentile (KM)	1408
Gamma Kaplan-Meier (KM) Statistics			
Approximate Chi Square Value (41.72, α)	27.92	Adjusted Chi Square Value (41.72, β)	27.17
95% Gamma Approximate KM-UCL (use when n>=50)	408.1	95% Gamma Adjusted KM-UCL (use when n<50)	419.3
Lognormal GOF Test on Detected Observations Only			
Shapiro Wilk Test Statistic	0.924	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.914	Detected Data appear Lognormal at 5% Significance Leve	
Lilliefors Test Statistic	0.136	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.18	Detected Data appear Lognormal at 5% Significance Leve	
Detected Data appear Lognormal at 5% Significance Leve			
Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	268.9	Mean in Log Scale	4.826
SD in Original Scale	295.7	SD in Log Scale	1.496
95% t UCL (assumes normality of ROS data)	367.9	95% Percentile Bootstrap UCL	365.5
95% BCA Bootstrap UCL	376.3	95% Bootstrap t UCL	392.9
95% H-UCL (Log ROS)	998.7		
Statistics using KM estimates on Logged Data and Assuming Lognormal Distributior			
KM Mean (logged)	4.787	KM Geo Mean	120
KM SD (logged)	1.575	95% Critical H Value (KM-Log)	3.331
KM Standard Error of Mean (logged)	0.329	95% H-UCL (KM -Log)	1183
KM SD (logged)	1.575	95% Critical H Value (KM-Log)	3.331
KM Standard Error of Mean (logged)	0.329		
DL/2 Statistics			
DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	283.7	Mean in Log Scale	4.916
SD in Original Scale	295.3	SD in Log Scale	1.483
95% t UCL (Assumes normality)	382.6	95% H-Stat UCL	1054
DL/2 is not a recommended method, provided for comparisons and historical reasons			
Nonparametric Distribution Free UCL Statistics			
Detected Data appear Gamma Distributed at 5% Significance Leve			
Suggested UCL to Use			
Gamma Adjusted KM-UCL (use when k<=1 and 15 < n < 50 but	419.3		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
Recommendations are based upon data size, data distribution, and skewness
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statisticiar

APPENDIX B-1C2

PAHs in Soil - Zone 4

Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH diesel and motor oil in milligrams per kilogram (mg/kg)

Benzo(b)fluoranthene

General Statistics			
Total Number of Observations	26	Number of Distinct Observations	22
Number of Detects	23	Number of Non-Detects	3
Number of Distinct Detects	20	Number of Distinct Non-Detects	3
Minimum Detect	2.6	Minimum Non-Detect	40
Maximum Detect	990	Maximum Non-Detect	1000
Variance Detects	77263	Percent Non-Detects	11.54%
Mean Detects	290.9	SD Detects	278
Median Detects	160	CV Detects	0.956
Skewness Detects	0.957	Kurtosis Detects	-0.0482
Mean of Logged Detects	4.988	SD of Logged Detects	1.501

Normal GOF Test on Detects Only		
Shapiro Wilk Test Statistic	0.857	Shapiro Wilk GOF Test
5% Shapiro Wilk Critical Value	0.914	Detected Data Not Normal at 5% Significance Leve
Lilliefors Test Statistic	0.237	Lilliefors GOF Test
5% Lilliefors Critical Value	0.18	Detected Data Not Normal at 5% Significance Leve
Detected Data Not Normal at 5% Significance Leve		

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
KM Mean	269.4	KM Standard Error of Mean	55.39
KM SD	270.8	95% KM (BCA) UCL	365
95% KM (t) UCL	364	95% KM (Percentile Bootstrap) UCL	369.4
95% KM (z) UCL	360.5	95% KM Bootstrap t UCL	373.1
90% KM Chebyshev UCL	435.5	95% KM Chebyshev UCL	510.8
97.5% KM Chebyshev UCL	615.3	99% KM Chebyshev UCL	820.5

Gamma GOF Tests on Detected Observations Only		
A-D Test Statistic	0.398	Anderson-Darling GOF Test
5% A-D Critical Value	0.777	Detected data appear Gamma Distributed at 5% Significance Leve
K-S Test Statistic	0.164	Kolmogorov-Smirnov GOF
5% K-S Critical Value	0.188	Detected data appear Gamma Distributed at 5% Significance Leve
Detected data appear Gamma Distributed at 5% Significance Leve		

Gamma Statistics on Detected Data Only			
k hat (MLE)	0.858	k star (bias corrected MLE)	0.775
Theta hat (MLE)	338.9	Theta star (bias corrected MLE)	375.2
nu hat (MLE)	39.48	nu star (bias corrected)	35.66
Mean (detects)	290.9		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	2.6	Mean	265.8
Maximum	990	Median	150
SD	271.5	CV	1.022
k hat (MLE)	0.786	k star (bias corrected MLE)	0.721
Theta hat (MLE)	338	Theta star (bias corrected MLE)	368.5
nu hat (MLE)	40.89	nu star (bias corrected)	37.51
Adjusted Level of Significance (β)	0.0398		
Approximate Chi Square Value (37.51, α)	24.48	Adjusted Chi Square Value (37.51, β)	23.79
95% Gamma Approximate UCL (use when n>=50)	407.2	95% Gamma Adjusted UCL (use when n<50)	419.1

Estimates of Gamma Parameters using KM Estimates			
Mean (KM)	269.4	SD (KM)	270.8
Variance (KM)	73343	SE of Mean (KM)	55.39
k hat (KM)	0.989	k star (KM)	0.901
nu hat (KM)	51.44	nu star (KM)	46.84

APPENDIX B-1C2

PAHs in Soil - Zone 4

Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH diesel and motor oil in milligrams per kilogram (mg/kg)

theta hat (KM)	272.3	theta star (KM)	299
80% gamma percentile (KM)	437	90% gamma percentile (KM)	636.4
95% gamma percentile (KM)	837.4	99% gamma percentile (KM)	1308
Gamma Kaplan-Meier (KM) Statistics			
Approximate Chi Square Value (46.84, α)	32.13	Adjusted Chi Square Value (46.84, β)	31.33
95% Gamma Approximate KM-UCL (use when n>=50)	392.6	95% Gamma Adjusted KM-UCL (use when n<50)	402.7
Lognormal GOF Test on Detected Observations Only			
Shapiro Wilk Test Statistic	0.898	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.914	Detected Data Not Lognormal at 5% Significance Leve	
Lilliefors Test Statistic	0.141	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.18	Detected Data appear Lognormal at 5% Significance Leve	
Detected Data appear Approximate Lognormal at 5% Significance Leve			
Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	263.6	Mean in Log Scale	4.824
SD in Original Scale	272.4	SD in Log Scale	1.515
95% t UCL (assumes normality of ROS data)	354.9	95% Percentile Bootstrap UCL	353.5
95% BCA Bootstrap UCL	368.5	95% Bootstrap t UCL	373.5
95% H-UCL (Log ROS)	1046		
Statistics using KM estimates on Logged Data and Assuming Lognormal Distributior			
KM Mean (logged)	4.787	KM Geo Mean	120
KM SD (logged)	1.6	95% Critical H Value (KM-Log)	3.369
KM Standard Error of Mean (logged)	0.336	95% H-UCL (KM -Log)	1267
KM SD (logged)	1.6	95% Critical H Value (KM-Log)	3.369
KM Standard Error of Mean (logged)	0.336		
DL/2 Statistics			
DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	279.2	Mean in Log Scale	4.917
SD in Original Scale	273.6	SD in Log Scale	1.497
95% t UCL (Assumes normality)	370.9	95% H-Stat UCL	1096
DL/2 is not a recommended method, provided for comparisons and historical reasons			
Nonparametric Distribution Free UCL Statistics			
Detected Data appear Gamma Distributed at 5% Significance Leve			
Suggested UCL to Use			
Gamma Adjusted KM-UCL (use when k<=1 and 15 < n < 50 but	402.7		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
Recommendations are based upon data size, data distribution, and skewness
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statisticiar

APPENDIX B-1C2

PAHs in Soil - Zone 4

Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH diesel and motor oil in milligrams per kilogram (mg/kg)

Benzo(g,h,i)perylene

General Statistics			
Total Number of Observations	26	Number of Distinct Observations	18
Number of Detects	15	Number of Non-Detects	11
Number of Distinct Detects	13	Number of Distinct Non-Detects	6
Minimum Detect	4.2	Minimum Non-Detect	43
Maximum Detect	900	Maximum Non-Detect	2100
Variance Detects	49205	Percent Non-Detects	42.31%
Mean Detects	157.7	SD Detects	221.8
Median Detects	110	CV Detects	1.406
Skewness Detects	3.004	Kurtosis Detects	10.11
Mean of Logged Detects	4.33	SD of Logged Detects	1.376

Normal GOF Test on Detects Only			
Shapiro Wilk Test Statistic	0.624	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.881	Detected Data Not Normal at 5% Significance Leve	
Lilliefors Test Statistic	0.278	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.22	Detected Data Not Normal at 5% Significance Leve	
Detected Data Not Normal at 5% Significance Leve			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
KM Mean	122.8	KM Standard Error of Mean	37.71
KM SD	176.2	95% KM (BCA) UCL	190.3
95% KM (t) UCL	187.2	95% KM (Percentile Bootstrap) UCL	191.3
95% KM (z) UCL	184.8	95% KM Bootstrap t UCL	244.1
90% KM Chebyshev UCL	235.9	95% KM Chebyshev UCL	287.1
97.5% KM Chebyshev UCL	358.3	99% KM Chebyshev UCL	498

Gamma GOF Tests on Detected Observations Only			
A-D Test Statistic	0.329	Anderson-Darling GOF Test	
5% A-D Critical Value	0.772	Detected data appear Gamma Distributed at 5% Significance Leve	
K-S Test Statistic	0.136	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.23	Detected data appear Gamma Distributed at 5% Significance Leve	
Detected data appear Gamma Distributed at 5% Significance Leve			

Gamma Statistics on Detected Data Only			
k hat (MLE)	0.81	k star (bias corrected MLE)	0.693
Theta hat (MLE)	194.7	Theta star (bias corrected MLE)	227.8
nu hat (MLE)	24.3	nu star (bias corrected)	20.78
Mean (detects)	157.7		

Gamma ROS Statistics using Imputed Non-Detects			
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs			
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20			
For such situations, GROS method may yield incorrect values of UCLs and BTVs			
This is especially true when the sample size is small.			
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates			
Minimum	0.01	Mean	112.2
Maximum	900	Median	62.6
SD	177.6	CV	1.583
k hat (MLE)	0.483	k star (bias corrected MLE)	0.453
Theta hat (MLE)	232.3	Theta star (bias corrected MLE)	247.7
nu hat (MLE)	25.12	nu star (bias corrected)	23.55
Adjusted Level of Significance (β)	0.0398		
Approximate Chi Square Value (23.55, α)	13.51	Adjusted Chi Square Value (23.55, β)	13.01
95% Gamma Approximate UCL (use when n>=50)	195.6	95% Gamma Adjusted UCL (use when n<50)	203.2

Estimates of Gamma Parameters using KM Estimates			
Mean (KM)	122.8	SD (KM)	176.2
Variance (KM)	31043	SE of Mean (KM)	37.71
k hat (KM)	0.486	k star (KM)	0.455
nu hat (KM)	25.25	nu star (KM)	23.67

APPENDIX B-1C2

PAHs in Soil - Zone 4

Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH diesel and motor oil in milligrams per kilogram (mg/kg)

theta hat (KM)	252.8	theta star (KM)	269.7
80% gamma percentile (KM)	200.6	90% gamma percentile (KM)	338.5
95% gamma percentile (KM)	487.6	99% gamma percentile (KM)	857.6
Gamma Kaplan-Meier (KM) Statistics			
Approximate Chi Square Value (23.67, α)	13.6	Adjusted Chi Square Value (23.67, β)	13.09
95% Gamma Approximate KM-UCL (use when n>=50)	213.7	95% Gamma Adjusted KM-UCL (use when n<50)	221.9
Lognormal GOF Test on Detected Observations Only			
Shapiro Wilk Test Statistic	0.962	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.881	Detected Data appear Lognormal at 5% Significance Leve	
Lilliefors Test Statistic	0.168	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.22	Detected Data appear Lognormal at 5% Significance Leve	
Detected Data appear Lognormal at 5% Significance Leve			
Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	112.6	Mean in Log Scale	4.083
SD in Original Scale	175.6	SD in Log Scale	1.151
95% t UCL (assumes normality of ROS data)	171.4	95% Percentile Bootstrap UCL	170.4
95% BCA Bootstrap UCL	221.1	95% Bootstrap t UCL	251.1
95% H-UCL (Log ROS)	214.7		
Statistics using KM estimates on Logged Data and Assuming Lognormal Distributior			
KM Mean (logged)	4.072	KM Geo Mean	58.65
KM SD (logged)	1.322	95% Critical H Value (KM-Log)	2.951
KM Standard Error of Mean (logged)	0.335	95% H-UCL (KM -Log)	306.8
KM SD (logged)	1.322	95% Critical H Value (KM-Log)	2.951
KM Standard Error of Mean (logged)	0.335		
DL/2 Statistics			
DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	198.6	Mean in Log Scale	4.625
SD in Original Scale	255.6	SD in Log Scale	1.281
95% t UCL (Assumes normality)	284.2	95% H-Stat UCL	485.4
DL/2 is not a recommended method, provided for comparisons and historical reasons			
Nonparametric Distribution Free UCL Statistics			
Detected Data appear Gamma Distributed at 5% Significance Leve			
Suggested UCL to Use			
Gamma Adjusted KM-UCL (use when k<=1 and 15 < n < 50 but	221.9		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
Recommendations are based upon data size, data distribution, and skewness
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statisticiar

APPENDIX B-1C2

PAHs in Soil - Zone 4

Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH diesel and motor oil in milligrams per kilogram (mg/kg)

Benzo(k)fluoranthene

General Statistics			
Total Number of Observations	26	Number of Distinct Observations	20
Number of Detects	20	Number of Non-Detects	6
Number of Distinct Detects	15	Number of Distinct Non-Detects	6
Minimum Detect	4.9	Minimum Non-Detect	40
Maximum Detect	990	Maximum Non-Detect	1000
Variance Detects	82294	Percent Non-Detects	23.08%
Mean Detects	231.8	SD Detects	286.9
Median Detects	160	CV Detects	1.238
Skewness Detects	2.002	Kurtosis Detects	3.531
Mean of Logged Detects	4.638	SD of Logged Detects	1.519

Normal GOF Test on Detects Only			
Shapiro Wilk Test Statistic	0.719	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.905	Detected Data Not Normal at 5% Significance Leve	
Lilliefors Test Statistic	0.275	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.192	Detected Data Not Normal at 5% Significance Leve	
Detected Data Not Normal at 5% Significance Leve			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
KM Mean	192.1	KM Standard Error of Mean	54.09
KM SD	263.1	95% KM (BCA) UCL	290
95% KM (t) UCL	284.5	95% KM (Percentile Bootstrap) UCL	290.6
95% KM (z) UCL	281	95% KM Bootstrap t UCL	348.5
90% KM Chebyshev UCL	354.3	95% KM Chebyshev UCL	427.9
97.5% KM Chebyshev UCL	529.9	99% KM Chebyshev UCL	730.3

Gamma GOF Tests on Detected Observations Only			
A-D Test Statistic	0.301	Anderson-Darling GOF Test	
5% A-D Critical Value	0.78	Detected data appear Gamma Distributed at 5% Significance Leve	
K-S Test Statistic	0.124	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.201	Detected data appear Gamma Distributed at 5% Significance Leve	
Detected data appear Gamma Distributed at 5% Significance Leve			

Gamma Statistics on Detected Data Only			
k hat (MLE)	0.742	k star (bias corrected MLE)	0.664
Theta hat (MLE)	312.3	Theta star (bias corrected MLE)	349
nu hat (MLE)	29.69	nu star (bias corrected)	26.57
Mean (detects)	231.8		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	183
Maximum	990	Median	94.84
SD	266.6	CV	1.457
k hat (MLE)	0.331	k star (bias corrected MLE)	0.319
Theta hat (MLE)	552.3	Theta star (bias corrected MLE)	574.1
nu hat (MLE)	17.23	nu star (bias corrected)	16.57
Adjusted Level of Significance (β)	0.0398		
Approximate Chi Square Value (16.57, α)	8.367	Adjusted Chi Square Value (16.57, β)	7.983
95% Gamma Approximate UCL (use when n>=50)	362.4	95% Gamma Adjusted UCL (use when n<50)	379.8

Estimates of Gamma Parameters using KM Estimates			
Mean (KM)	192.1	SD (KM)	263.1
Variance (KM)	69201	SE of Mean (KM)	54.09
k hat (KM)	0.533	k star (KM)	0.497
nu hat (KM)	27.72	nu star (KM)	25.85

APPENDIX B-1C2

PAHs in Soil - Zone 4

Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH diesel and motor oil in milligrams per kilogram (mg/kg)

theta hat (KM)	360.3	theta star (KM)	386.3
80% gamma percentile (KM)	315.4	90% gamma percentile (KM)	520.2
95% gamma percentile (KM)	739.3	99% gamma percentile (KM)	1278
Gamma Kaplan-Meier (KM) Statistics			
Approximate Chi Square Value (25.85, α)	15.27	Adjusted Chi Square Value (25.85, β)	14.73
95% Gamma Approximate KM-UCL (use when n>=50)	325.3	95% Gamma Adjusted KM-UCL (use when n<50)	337.1
Lognormal GOF Test on Detected Observations Only			
Shapiro Wilk Test Statistic	0.938	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.905	Detected Data appear Lognormal at 5% Significance Leve	
Lilliefors Test Statistic	0.168	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.192	Detected Data appear Lognormal at 5% Significance Leve	
Detected Data appear Lognormal at 5% Significance Leve			
Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	185.8	Mean in Log Scale	4.336
SD in Original Scale	264.5	SD in Log Scale	1.463
95% t UCL (assumes normality of ROS data)	274.4	95% Percentile Bootstrap UCL	276.3
95% BCA Bootstrap UCL	293.8	95% Bootstrap t UCL	352.6
95% H-UCL (Log ROS)	561.1		
Statistics using KM estimates on Logged Data and Assuming Lognormal Distributior			
KM Mean (logged)	4.295	KM Geo Mean	73.36
KM SD (logged)	1.566	95% Critical H Value (KM-Log)	3.317
KM Standard Error of Mean (logged)	0.339	95% H-UCL (KM -Log)	705.9
KM SD (logged)	1.566	95% Critical H Value (KM-Log)	3.317
KM Standard Error of Mean (logged)	0.339		
DL/2 Statistics			
DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	206.6	Mean in Log Scale	4.511
SD in Original Scale	267.9	SD in Log Scale	1.45
95% t UCL (Assumes normality)	296.4	95% H-Stat UCL	647.1
DL/2 is not a recommended method, provided for comparisons and historical reasons			
Nonparametric Distribution Free UCL Statistics			
Detected Data appear Gamma Distributed at 5% Significance Leve			
Suggested UCL to Use			
Gamma Adjusted KM-UCL (use when k<=1 and 15 < n < 50 but	337.1		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
Recommendations are based upon data size, data distribution, and skewness
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statisticiar

APPENDIX B-1C2

PAHs in Soil - Zone 4

Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH diesel and motor oil in milligrams per kilogram (mg/kg)

Chrysene

General Statistics			
Total Number of Observations	26	Number of Distinct Observations	19
Number of Detects	14	Number of Non-Detects	12
Number of Distinct Detects	13	Number of Distinct Non-Detects	7
Minimum Detect	3	Minimum Non-Detect	1.4
Maximum Detect	2900	Maximum Non-Detect	690
Variance Detects	562942	Percent Non-Detects	46.15%
Mean Detects	313	SD Detects	750.3
Median Detects	92	CV Detects	2.397
Skewness Detects	3.644	Kurtosis Detects	13.47
Mean of Logged Detects	4.497	SD of Logged Detects	1.582

Normal GOF Test on Detects Only			
Shapiro Wilk Test Statistic	0.405	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.874	Detected Data Not Normal at 5% Significance Leve	
Lilliefors Test Statistic	0.441	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.226	Detected Data Not Normal at 5% Significance Leve	
Detected Data Not Normal at 5% Significance Leve			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
KM Mean	182.1	KM Standard Error of Mean	112.1
KM SD	549.8	95% KM (BCA) UCL	419.9
95% KM (t) UCL	373.5	95% KM (Percentile Bootstrap) UCL	393.2
95% KM (z) UCL	366.4	95% KM Bootstrap t UCL	1150
90% KM Chebyshev UCL	518.3	95% KM Chebyshev UCL	670.5
97.5% KM Chebyshev UCL	881.9	99% KM Chebyshev UCL	1297

Gamma GOF Tests on Detected Observations Only			
A-D Test Statistic	1.078	Anderson-Darling GOF Test	
5% A-D Critical Value	0.793	Detected Data Not Gamma Distributed at 5% Significance Leve	
K-S Test Statistic	0.266	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.242	Detected Data Not Gamma Distributed at 5% Significance Leve	
Detected Data Not Gamma Distributed at 5% Significance Leve			

Gamma Statistics on Detected Data Only			
k hat (MLE)	0.507	k star (bias corrected MLE)	0.446
Theta hat (MLE)	617	Theta star (bias corrected MLE)	701.5
nu hat (MLE)	14.2	nu star (bias corrected)	12.49
Mean (detects)	313		

Gamma ROS Statistics using Imputed Non-Detects			
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs			
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20			
For such situations, GROS method may yield incorrect values of UCLs and BTVs			
This is especially true when the sample size is small.			
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates			
Minimum	0.01	Mean	168.5
Maximum	2900	Median	10
SD	564	CV	3.346
k hat (MLE)	0.158	k star (bias corrected MLE)	0.165
Theta hat (MLE)	1067	Theta star (bias corrected MLE)	1020
nu hat (MLE)	8.21	nu star (bias corrected)	8.596
Adjusted Level of Significance (β)	0.0398		
Approximate Chi Square Value (8.60, α)	3.085	Adjusted Chi Square Value (8.60, β)	2.87
95% Gamma Approximate UCL (use when n>=50)	469.6	95% Gamma Adjusted UCL (use when n<50)	504.8

Estimates of Gamma Parameters using KM Estimates			
Mean (KM)	182.1	SD (KM)	549.8
Variance (KM)	302327	SE of Mean (KM)	112.1
k hat (KM)	0.11	k star (KM)	0.123
nu hat (KM)	5.701	nu star (KM)	6.377

APPENDIX B-1C2

PAHs in Soil - Zone 4

Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH diesel and motor oil in milligrams per kilogram (mg/kg)

theta hat (KM)	1661	theta star (KM)	1485
80% gamma percentile (KM)	163.6	90% gamma percentile (KM)	518.8
95% gamma percentile (KM)	1036	99% gamma percentile (KM)	2606
Gamma Kaplan-Meier (KM) Statistics			
Approximate Chi Square Value (6.38, α)	1.835	Adjusted Chi Square Value (6.38, β)	1.68
95% Gamma Approximate KM-UCL (use when n>=50)	632.6	95% Gamma Adjusted KM-UCL (use when n<50)	691.3
Lognormal GOF Test on Detected Observations Only			
Shapiro Wilk Test Statistic	0.955	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.874	Detected Data appear Lognormal at 5% Significance Leve	
Lilliefors Test Statistic	0.158	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.226	Detected Data appear Lognormal at 5% Significance Leve	
Detected Data appear Lognormal at 5% Significance Leve			
Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	176.7	Mean in Log Scale	3.571
SD in Original Scale	561.6	SD in Log Scale	1.665
95% t UCL (assumes normality of ROS data)	364.8	95% Percentile Bootstrap UCL	391
95% BCA Bootstrap UCL	512.2	95% Bootstrap t UCL	1273
95% H-UCL (Log ROS)	451		
Statistics using KM estimates on Logged Data and Assuming Lognormal Distributior			
KM Mean (logged)	3.473	KM Geo Mean	32.22
KM SD (logged)	1.925	95% Critical H Value (KM-Log)	3.886
KM Standard Error of Mean (logged)	0.477	95% H-UCL (KM -Log)	918.4
KM SD (logged)	1.925	95% Critical H Value (KM-Log)	3.886
KM Standard Error of Mean (logged)	0.477		
DL/2 Statistics			
DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	204.1	Mean in Log Scale	4.069
SD in Original Scale	557.8	SD in Log Scale	1.627
95% t UCL (Assumes normality)	391	95% H-Stat UCL	667.6
DL/2 is not a recommended method, provided for comparisons and historical reasons			
Nonparametric Distribution Free UCL Statistics			
Detected Data appear Lognormal Distributed at 5% Significance Leve			
Suggested UCL to Use			
95% KM (Chebyshev) UCL	670.5		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
Recommendations are based upon data size, data distribution, and skewness
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statisticiar

APPENDIX B-1C2

PAHs in Soil - Zone 4

Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH diesel and motor oil in milligrams per kilogram (mg/kg)

Dibenzo(a,h)anthracene

General Statistics

Total Number of Observations	26	Number of Distinct Observations	18
Number of Detects	4	Number of Non-Detects	22
Number of Distinct Detects	4	Number of Distinct Non-Detects	14
Minimum Detect	7.5	Minimum Non-Detect	3.4
Maximum Detect	400	Maximum Non-Detect	1700
Variance Detects	29372	Percent Non-Detects	84.62%
Mean Detects	151.6	SD Detects	171.4
Median Detects	99.5	CV Detects	1.13
Skewness Detects	1.591	Kurtosis Detects	2.942
Mean of Logged Detects	4.299	SD of Logged Detects	1.661

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.847	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Normal at 5% Significance Leve	
Lilliefors Test Statistic	0.346	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.375	Detected Data appear Normal at 5% Significance Leve	
Detected Data appear Normal at 5% Significance Leve			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	35.89	KM Standard Error of Mean	21.49
KM SD	84.63	95% KM (BCA) UCL	N/A
95% KM (t) UCL	72.59	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	71.23	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	100.3	95% KM Chebyshev UCL	129.5
97.5% KM Chebyshev UCL	170.1	99% KM Chebyshev UCL	249.7

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.274	Anderson-Darling GOF Test	
5% A-D Critical Value	0.669	Detected data appear Gamma Distributed at 5% Significance Leve	
K-S Test Statistic	0.227	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.404	Detected data appear Gamma Distributed at 5% Significance Leve	
Detected data appear Gamma Distributed at 5% Significance Leve			

Gamma Statistics on Detected Data Only

k hat (MLE)	0.819	k star (bias corrected MLE)	0.371
Theta hat (MLE)	185.2	Theta star (bias corrected MLE)	408.3
nu hat (MLE)	6.551	nu star (bias corrected)	2.971
Mean (detects)	151.6		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	24.21
Maximum	400	Median	0.01
SD	81.33	CV	3.36
k hat (MLE)	0.128	k star (bias corrected MLE)	0.139
Theta hat (MLE)	188.7	Theta star (bias corrected MLE)	174
nu hat (MLE)	6.672	nu star (bias corrected)	7.235
Adjusted Level of Significance (β)	0.0398		
Approximate Chi Square Value (7.24, α)	2.3	Adjusted Chi Square Value (7.24, β)	2.121
95% Gamma Approximate UCL (use when n>=50)	76.13	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	35.89	SD (KM)	84.63
Variance (KM)	7163	SE of Mean (KM)	21.49
k hat (KM)	0.18	k star (KM)	0.185
nu hat (KM)	9.352	nu star (KM)	9.606

APPENDIX B-1C2

PAHs in Soil - Zone 4

Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH diesel and motor oil in milligrams per kilogram (mg/kg)

theta hat (KM)	199.6	theta star (KM)	194.3
80% gamma percentile (KM)	45.24	90% gamma percentile (KM)	108.4
95% gamma percentile (KM)	188.7	99% gamma percentile (KM)	412.8
Gamma Kaplan-Meier (KM) Statistics			
Approximate Chi Square Value (9.61, α)	3.697	Adjusted Chi Square Value (9.61, β)	3.458
95% Gamma Approximate KM-UCL (use when n>=50)	93.26	95% Gamma Adjusted KM-UCL (use when n<50)	99.71
Lognormal GOF Test on Detected Observations Only			
Shapiro Wilk Test Statistic	0.926	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Lognormal at 5% Significance Leve	
Lilliefors Test Statistic	0.295	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.375	Detected Data appear Lognormal at 5% Significance Leve	
Detected Data appear Lognormal at 5% Significance Leve			
Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	26.88	Mean in Log Scale	1.391
SD in Original Scale	80.57	SD in Log Scale	1.692
95% t UCL (assumes normality of ROS data)	53.87	95% Percentile Bootstrap UCL	55.28
95% BCA Bootstrap UCL	77.09	95% Bootstrap t UCL	121.3
95% H-UCL (Log ROS)	55.26		
Statistics using KM estimates on Logged Data and Assuming Lognormal Distributior			
KM Mean (logged)	2.141	KM Geo Mean	8.504
KM SD (logged)	1.411	95% Critical H Value (KM-Log)	3.081
KM Standard Error of Mean (logged)	0.445	95% H-UCL (KM -Log)	54.88
KM SD (logged)	1.411	95% Critical H Value (KM-Log)	3.081
KM Standard Error of Mean (logged)	0.445		
DL/2 Statistics			
DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	124.4	Mean in Log Scale	3.942
SD in Original Scale	184	SD in Log Scale	1.498
95% t UCL (Assumes normality)	186.1	95% H-Stat UCL	413.8
DL/2 is not a recommended method, provided for comparisons and historical reasons			
Nonparametric Distribution Free UCL Statistics			
Detected Data appear Normal Distributed at 5% Significance Leve			
Suggested UCL to Use			
95% KM (t) UCL	72.59		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
Recommendations are based upon data size, data distribution, and skewness
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statisticiar

APPENDIX B-1C2
PAHs in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH diesel and motor oil in milligrams per kilogram (mg/kg)

Fluoranthene

General Statistics

Total Number of Observations	26	Number of Distinct Observations	22
Number of Detects	21	Number of Non-Detects	5
Number of Distinct Detects	20	Number of Distinct Non-Detects	3
Minimum Detect	1.5	Minimum Non-Detect	69
Maximum Detect	1300	Maximum Non-Detect	280
Variance Detects	121299	Percent Non-Detects	19.23%
Mean Detects	230.5	SD Detects	348.3
Median Detects	78	CV Detects	1.511
Skewness Detects	2.205	Kurtosis Detects	4.324
Mean of Logged Detects	4.439	SD of Logged Detects	1.643

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.646	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.908	Detected Data Not Normal at 5% Significance Leve	
Lilliefors Test Statistic	0.326	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.188	Detected Data Not Normal at 5% Significance Leve	
Detected Data Not Normal at 5% Significance Leve			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	195.8	KM Standard Error of Mean	63.19
KM SD	314	95% KM (BCA) UCL	302.5
95% KM (t) UCL	303.7	95% KM (Percentile Bootstrap) UCL	303.8
95% KM (z) UCL	299.7	95% KM Bootstrap t UCL	421.4
90% KM Chebyshev UCL	385.3	95% KM Chebyshev UCL	471.2
97.5% KM Chebyshev UCL	590.4	99% KM Chebyshev UCL	824.5

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.882	Anderson-Darling GOF Test	
5% A-D Critical Value	0.795	Detected Data Not Gamma Distributed at 5% Significance Leve	
K-S Test Statistic	0.249	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.199	Detected Data Not Gamma Distributed at 5% Significance Leve	
Detected Data Not Gamma Distributed at 5% Significance Leve			

Gamma Statistics on Detected Data Only

k hat (MLE)	0.615	k star (bias corrected MLE)	0.559
Theta hat (MLE)	374.8	Theta star (bias corrected MLE)	412.4
nu hat (MLE)	25.83	nu star (bias corrected)	23.47
Mean (detects)	230.5		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	189.3
Maximum	1300	Median	66.5
SD	323.3	CV	1.708
k hat (MLE)	0.351	k star (bias corrected MLE)	0.336
Theta hat (MLE)	539.4	Theta star (bias corrected MLE)	563.2
nu hat (MLE)	18.25	nu star (bias corrected)	17.48
Adjusted Level of Significance (β)	0.0398		
Approximate Chi Square Value (17.48, α)	9.016	Adjusted Chi Square Value (17.48, β)	8.615
95% Gamma Approximate UCL (use when n>=50)	367.1	95% Gamma Adjusted UCL (use when n<50)	384.1

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	195.8	SD (KM)	314
Variance (KM)	98605	SE of Mean (KM)	63.19
k hat (KM)	0.389	k star (KM)	0.369
nu hat (KM)	20.21	nu star (KM)	19.21

APPENDIX B-1C2

PAHs in Soil - Zone 4

Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH diesel and motor oil in milligrams per kilogram (mg/kg)

theta hat (KM)	503.7	theta star (KM)	529.9
80% gamma percentile (KM)	312.6	90% gamma percentile (KM)	560.5
95% gamma percentile (KM)	835.8	99% gamma percentile (KM)	1534
Gamma Kaplan-Meier (KM) Statistics			
Approximate Chi Square Value (19.21, α)	10.27	Adjusted Chi Square Value (19.21, β)	9.84
95% Gamma Approximate KM-UCL (use when n>=50)	366.1	95% Gamma Adjusted KM-UCL (use when n<50)	382.2
Lognormal GOF Test on Detected Observations Only			
Shapiro Wilk Test Statistic	0.924	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.908	Detected Data appear Lognormal at 5% Significance Leve	
Lilliefors Test Statistic	0.184	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.188	Detected Data appear Lognormal at 5% Significance Leve	
Detected Data appear Lognormal at 5% Significance Leve			
Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	192.9	Mean in Log Scale	4.244
SD in Original Scale	321.3	SD in Log Scale	1.544
95% t UCL (assumes normality of ROS data)	300.6	95% Percentile Bootstrap UCL	298.3
95% BCA Bootstrap UCL	345.2	95% Bootstrap t UCL	390.6
95% H-UCL (Log ROS)	632.3		
Statistics using KM estimates on Logged Data and Assuming Lognormal Distributior			
KM Mean (logged)	4.244	KM Geo Mean	69.7
KM SD (logged)	1.6	95% Critical H Value (KM-Log)	3.37
KM Standard Error of Mean (logged)	0.348	95% H-UCL (KM -Log)	737.8
KM SD (logged)	1.6	95% Critical H Value (KM-Log)	3.37
KM Standard Error of Mean (logged)	0.348		
DL/2 Statistics			
DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	199.6	Mean in Log Scale	4.375
SD in Original Scale	318.6	SD in Log Scale	1.494
95% t UCL (Assumes normality)	306.3	95% H-Stat UCL	631.8
DL/2 is not a recommended method, provided for comparisons and historical reasons			
Nonparametric Distribution Free UCL Statistics			
Detected Data appear Lognormal Distributed at 5% Significance Leve			
Suggested UCL to Use			
95% KM (Chebyshev) UCL	471.2		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
Recommendations are based upon data size, data distribution, and skewness
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statisticiar

APPENDIX B-1C2
PAHs in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH diesel and motor oil in milligrams per kilogram (mg/kg)

Fluorene

General Statistics

Total Number of Observations	26	Number of Distinct Observations	21
Number of Detects	3	Number of Non-Detects	23
Number of Distinct Detects	3	Number of Distinct Non-Detects	18
Minimum Detect	21	Minimum Non-Detect	2.2
Maximum Detect	4300	Maximum Non-Detect	1100
Variance Detects	5911460	Percent Non-Detects	88.46%
Mean Detects	1494	SD Detects	2431
Median Detects	160	CV Detects	1.628
Skewness Detects	1.726	Kurtosis Detects	N/A
Mean of Logged Detects	5.495	SD of Logged Detects	2.686

Warning: Data set has only 3 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.774	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Normal at 5% Significance Leve	
Lilliefors Test Statistic	0.375	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.425	Detected Data appear Normal at 5% Significance Leve	

Detected Data appear Normal at 5% Significance Leve

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	178.9	KM Standard Error of Mean	198.2
KM SD	824.9	95% KM (BCA) UCL	N/A
95% KM (t) UCL	517.5	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	505	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	773.6	95% KM Chebyshev UCL	1043
97.5% KM Chebyshev UCL	1417	99% KM Chebyshev UCL	2151

Gamma GOF Tests on Detected Observations Only
Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	0.368	k star (bias corrected MLE)	N/A
Theta hat (MLE)	4061	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	2.207	nu star (bias corrected)	N/A
Mean (detects)	1494		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	172.4
Maximum	4300	Median	0.01
SD	842.5	CV	4.888
k hat (MLE)	0.0951	k star (bias corrected MLE)	0.11
Theta hat (MLE)	1812	Theta star (bias corrected MLE)	1570
nu hat (MLE)	4.947	nu star (bias corrected)	5.71
Adjusted Level of Significance (β)	0.0398		
Approximate Chi Square Value (5.71, α)	1.493	Adjusted Chi Square Value (5.71, β)	1.357
95% Gamma Approximate UCL (use when n>=50)	659	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	178.9	SD (KM)	824.9
Variance (KM)	680524	SE of Mean (KM)	198.2
k hat (KM)	0.047	k star (KM)	0.0672
nu hat (KM)	2.446	nu star (KM)	3.497

APPENDIX B-1C2

PAHs in Soil - Zone 4

Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH diesel and motor oil in milligrams per kilogram (mg/kg)

theta hat (KM)	3804	theta star (KM)	2660
80% gamma percentile (KM)	58.26	90% gamma percentile (KM)	373.7
95% gamma percentile (KM)	1024	99% gamma percentile (KM)	3433

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (3.50, α)	0.534	Adjusted Chi Square Value (3.50, β)	0.467
95% Gamma Approximate KM-UCL (use when n>=50)	1172	95% Gamma Adjusted KM-UCL (use when n<50)	1339

95% Gamma Adjusted KM-UCL (use when k<=1 and 15 < n < 50)

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.982	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Lognormal at 5% Significance Leve	
Lilliefors Test Statistic	0.229	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.425	Detected Data appear Lognormal at 5% Significance Leve	

Detected Data appear Lognormal at 5% Significance Leve

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	172.6	Mean in Log Scale	-1.165
SD in Original Scale	842.4	SD in Log Scale	2.867
95% t UCL (assumes normality of ROS data)	454.8	95% Percentile Bootstrap UCL	502.6
95% BCA Bootstrap UCL	670.3	95% Bootstrap t UCL	35547
95% H-UCL (Log ROS)	437.2		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distributior

KM Mean (logged)	1.708	KM Geo Mean	5.517
KM SD (logged)	1.795	95% Critical H Value (KM-Log)	3.676
KM Standard Error of Mean (logged)	0.599	95% H-UCL (KM -Log)	103.3
KM SD (logged)	1.795	95% Critical H Value (KM-Log)	3.676
KM Standard Error of Mean (logged)	0.599		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	240.8	Mean in Log Scale	3.688
SD in Original Scale	835.7	SD in Log Scale	1.76
95% t UCL (Assumes normality)	520.7	95% H-Stat UCL	672.8

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Normal Distributed at 5% Significance Leve

Suggested UCL to Use

95% KM (t) UCL	517.5

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL

Recommendations are based upon data size, data distribution, and skewness

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statisticiar

APPENDIX B-1C2

PAHs in Soil - Zone 4

Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH diesel and motor oil in milligrams per kilogram (mg/kg)

Indeno(1,2,3-cd)pyrene

General Statistics			
Total Number of Observations	26	Number of Distinct Observations	18
Number of Detects	6	Number of Non-Detects	20
Number of Distinct Detects	6	Number of Distinct Non-Detects	13
Minimum Detect	13	Minimum Non-Detect	4.1
Maximum Detect	520	Maximum Non-Detect	2100
Variance Detects	36072	Percent Non-Detects	76.92%
Mean Detects	163.5	SD Detects	189.9
Median Detects	88	CV Detects	1.162
Skewness Detects	1.731	Kurtosis Detects	2.879
Mean of Logged Detects	4.491	SD of Logged Detects	1.287

Normal GOF Test on Detects Only			
Shapiro Wilk Test Statistic	0.799	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.788	Detected Data appear Normal at 5% Significance Leve	
Lilliefors Test Statistic	0.313	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.325	Detected Data appear Normal at 5% Significance Leve	
Detected Data appear Normal at 5% Significance Leve			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
KM Mean	57.11	KM Standard Error of Mean	26.67
KM SD	112	95% KM (BCA) UCL	102.4
95% KM (t) UCL	102.7	95% KM (Percentile Bootstrap) UCL	100.7
95% KM (z) UCL	101	95% KM Bootstrap t UCL	129.5
90% KM Chebyshev UCL	137.1	95% KM Chebyshev UCL	173.4
97.5% KM Chebyshev UCL	223.7	99% KM Chebyshev UCL	322.5

Gamma GOF Tests on Detected Observations Only			
A-D Test Statistic	0.23	Anderson-Darling GOF Test	
5% A-D Critical Value	0.716	Detected data appear Gamma Distributed at 5% Significance Leve	
K-S Test Statistic	0.229	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.341	Detected data appear Gamma Distributed at 5% Significance Leve	
Detected data appear Gamma Distributed at 5% Significance Leve			

Gamma Statistics on Detected Data Only			
k hat (MLE)	0.958	k star (bias corrected MLE)	0.59
Theta hat (MLE)	170.7	Theta star (bias corrected MLE)	277.1
nu hat (MLE)	11.5	nu star (bias corrected)	7.081
Mean (detects)	163.5		

Gamma ROS Statistics using Imputed Non-Detects			
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs			
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20			
For such situations, GROS method may yield incorrect values of UCLs and BTVs			
This is especially true when the sample size is small.			
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates			
Minimum	0.01	Mean	40.23
Maximum	520	Median	0.01
SD	109.5	CV	2.723
k hat (MLE)	0.15	k star (bias corrected MLE)	0.159
Theta hat (MLE)	267.6	Theta star (bias corrected MLE)	253.6
nu hat (MLE)	7.816	nu star (bias corrected)	8.247
Adjusted Level of Significance (β)	0.0398		
Approximate Chi Square Value (8.25, α)	2.879	Adjusted Chi Square Value (8.25, β)	2.673
95% Gamma Approximate UCL (use when n>=50)	115.2	95% Gamma Adjusted UCL (use when n<50)	124.1

Estimates of Gamma Parameters using KM Estimates			
Mean (KM)	57.11	SD (KM)	112
Variance (KM)	12537	SE of Mean (KM)	26.67
k hat (KM)	0.26	k star (KM)	0.256
nu hat (KM)	13.53	nu star (KM)	13.3

APPENDIX B-1C2

PAHs in Soil - Zone 4

Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH diesel and motor oil in milligrams per kilogram (mg/kg)

theta hat (KM)	219.5	theta star (KM)	223.3
80% gamma percentile (KM)	83.61	90% gamma percentile (KM)	171.1
95% gamma percentile (KM)	274.6	99% gamma percentile (KM)	549

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (13.30, α)	6.096	Adjusted Chi Square Value (13.30, β)	5.775
95% Gamma Approximate KM-UCL (use when n>=50)	124.6	95% Gamma Adjusted KM-UCL (use when n<50)	131.5

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.985	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.788	Detected Data appear Lognormal at 5% Significance Leve	
Lilliefors Test Statistic	0.157	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.325	Detected Data appear Lognormal at 5% Significance Leve	
Detected Data appear Lognormal at 5% Significance Leve			

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	47.38	Mean in Log Scale	2.745
SD in Original Scale	107.3	SD in Log Scale	1.328
95% t UCL (assumes normality of ROS data)	83.32	95% Percentile Bootstrap UCL	86.77
95% BCA Bootstrap UCL	105.1	95% Bootstrap t UCL	187.3
95% H-UCL (Log ROS)	82.47		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distributior

KM Mean (logged)	2.813	KM Geo Mean	16.66
KM SD (logged)	1.497	95% Critical H Value (KM-Log)	3.212
KM Standard Error of Mean (logged)	0.469	95% H-UCL (KM -Log)	133.6
KM SD (logged)	1.497	95% Critical H Value (KM-Log)	3.212
KM Standard Error of Mean (logged)	0.469		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	158.4	Mean in Log Scale	4.235
SD in Original Scale	227.3	SD in Log Scale	1.46
95% t UCL (Assumes normality)	234.5	95% H-Stat UCL	504.3

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Normal Distributed at 5% Significance Leve

Suggested UCL to Use

95% KM (t) UCL	102.7

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
Recommendations are based upon data size, data distribution, and skewness
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statisticiar

APPENDIX B-1C2
PAHs in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH diesel and motor oil in milligrams per kilogram (mg/kg)

Naphthalene

General Statistics

Total Number of Observations	26	Number of Distinct Observations	17
Number of Detects	3	Number of Non-Detects	23
Number of Distinct Detects	3	Number of Distinct Non-Detects	14
Minimum Detect	37	Minimum Non-Detect	3.4
Maximum Detect	660	Maximum Non-Detect	1700
Variance Detects	120001	Percent Non-Detects	88.46%
Mean Detects	261	SD Detects	346.4
Median Detects	86	CV Detects	1.327
Skewness Detects	1.693	Kurtosis Detects	N/A
Mean of Logged Detects	4.853	SD of Logged Detects	1.481

Warning: Data set has only 3 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.809	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Normal at 5% Significance Leve	
Lilliefors Test Statistic	0.36	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.425	Detected Data appear Normal at 5% Significance Leve	

Detected Data appear Normal at 5% Significance Leve

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	43.44	KM Standard Error of Mean	34.77
KM SD	133.6	95% KM (BCA) UCL	N/A
95% KM (t) UCL	102.8	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	100.6	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	147.7	95% KM Chebyshev UCL	195
97.5% KM Chebyshev UCL	260.6	99% KM Chebyshev UCL	389.4

Gamma GOF Tests on Detected Observations Only
Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	0.83	k star (bias corrected MLE)	N/A
Theta hat (MLE)	314.6	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	4.978	nu star (bias corrected)	N/A
Mean (detects)	261		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	30.12
Maximum	660	Median	0.01
SD	129.7	CV	4.307
k hat (MLE)	0.115	k star (bias corrected MLE)	0.128
Theta hat (MLE)	261.4	Theta star (bias corrected MLE)	236.1
nu hat (MLE)	5.992	nu star (bias corrected)	6.634
Adjusted Level of Significance (β)	0.0398		
Approximate Chi Square Value (6.63, α)	1.972	Adjusted Chi Square Value (6.63, β)	1.809
95% Gamma Approximate UCL (use when n>=50)	101.3	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	43.44	SD (KM)	133.6
Variance (KM)	17850	SE of Mean (KM)	34.77
k hat (KM)	0.106	k star (KM)	0.119
nu hat (KM)	5.498	nu star (KM)	6.197

APPENDIX B-1C2

PAHs in Soil - Zone 4

Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH diesel and motor oil in milligrams per kilogram (mg/kg)

theta hat (KM)	410.9	theta star (KM)	364.5
80% gamma percentile (KM)	37.8	90% gamma percentile (KM)	122.8
95% gamma percentile (KM)	248.1	99% gamma percentile (KM)	631.1

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (6.20, α)	1.741	Adjusted Chi Square Value (6.20, β)	1.59
95% Gamma Approximate KM-UCL (use when n>=50)	154.6	95% Gamma Adjusted KM-UCL (use when n<50)	169.3

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.946	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Lognormal at 5% Significance Leve	
Lilliefors Test Statistic	0.273	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.425	Detected Data appear Lognormal at 5% Significance Leve	
Detected Data appear Lognormal at 5% Significance Leve			

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	34	Mean in Log Scale	1.407
SD in Original Scale	128.9	SD in Log Scale	1.649
95% t UCL (assumes normality of ROS data)	77.18	95% Percentile Bootstrap UCL	82.39
95% BCA Bootstrap UCL	112.2	95% Bootstrap t UCL	525.1
95% H-UCL (Log ROS)	49.49		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distributior

KM Mean (logged)	2.059	KM Geo Mean	7.84
KM SD (logged)	1.474	95% Critical H Value (KM-Log)	3.177
KM Standard Error of Mean (logged)	0.53	95% H-UCL (KM -Log)	59.31
KM SD (logged)	1.474	95% Critical H Value (KM-Log)	3.177
KM Standard Error of Mean (logged)	0.53		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	137.2	Mean in Log Scale	3.976
SD in Original Scale	205.2	SD in Log Scale	1.571
95% t UCL (Assumes normality)	205.9	95% H-Stat UCL	520.1

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Normal Distributed at 5% Significance Leve

Suggested UCL to Use

95% KM (t) UCL	102.8

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
Recommendations are based upon data size, data distribution, and skewness
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statisticiar

APPENDIX B-1C2
PAHs in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH diesel and motor oil in milligrams per kilogram (mg/kg)

Phenanthrene

General Statistics			
Total Number of Observations	26	Number of Distinct Observations	23
Number of Detects	17	Number of Non-Detects	9
Number of Distinct Detects	17	Number of Distinct Non-Detects	7
Minimum Detect	2.4	Minimum Non-Detect	8.8
Maximum Detect	13000	Maximum Non-Detect	880
Variance Detects	9789384	Percent Non-Detects	34.62%
Mean Detects	870.1	SD Detects	3129
Median Detects	77	CV Detects	3.596
Skewness Detects	4.11	Kurtosis Detects	16.92
Mean of Logged Detects	4.331	SD of Logged Detects	1.934

Normal GOF Test on Detects Only			
Shapiro Wilk Test Statistic	0.291	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.892	Detected Data Not Normal at 5% Significance Leve	
Lilliefors Test Statistic	0.477	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.207	Detected Data Not Normal at 5% Significance Leve	
Detected Data Not Normal at 5% Significance Leve			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
KM Mean	586.2	KM Standard Error of Mean	502.5
KM SD	2485	95% KM (BCA) UCL	1592
95% KM (t) UCL	1445	95% KM (Percentile Bootstrap) UCL	1578
95% KM (z) UCL	1413	95% KM Bootstrap t UCL	20822
90% KM Chebyshev UCL	2094	95% KM Chebyshev UCL	2777
97.5% KM Chebyshev UCL	3724	99% KM Chebyshev UCL	5586

Gamma GOF Tests on Detected Observations Only			
A-D Test Statistic	2.616	Anderson-Darling GOF Test	
5% A-D Critical Value	0.848	Detected Data Not Gamma Distributed at 5% Significance Leve	
K-S Test Statistic	0.386	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.228	Detected Data Not Gamma Distributed at 5% Significance Leve	
Detected Data Not Gamma Distributed at 5% Significance Leve			

Gamma Statistics on Detected Data Only			
k hat (MLE)	0.285	k star (bias corrected MLE)	0.274
Theta hat (MLE)	3051	Theta star (bias corrected MLE)	3174
nu hat (MLE)	9.697	nu star (bias corrected)	9.319
Mean (detects)	870.1		

Gamma ROS Statistics using Imputed Non-Detects			
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs			
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20			
For such situations, GROS method may yield incorrect values of UCLs and BTVs			
This is especially true when the sample size is small.			
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates			
Minimum	0.01	Mean	568.9
Maximum	13000	Median	41
SD	2538	CV	4.462
k hat (MLE)	0.15	k star (bias corrected MLE)	0.159
Theta hat (MLE)	3781	Theta star (bias corrected MLE)	3584
nu hat (MLE)	7.824	nu star (bias corrected)	8.254
Adjusted Level of Significance (β)	0.0398		
Approximate Chi Square Value (8.25, α)	2.883	Adjusted Chi Square Value (8.25, β)	2.677
95% Gamma Approximate UCL (use when n>=50)	1629	95% Gamma Adjusted UCL (use when n<50)	1754

Estimates of Gamma Parameters using KM Estimates			
Mean (KM)	586.2	SD (KM)	2485
Variance (KM)	6177705	SE of Mean (KM)	502.5
k hat (KM)	0.0556	k star (KM)	0.0748
nu hat (KM)	2.893	nu star (KM)	3.892

APPENDIX B-1C2

PAHs in Soil - Zone 4

Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH diesel and motor oil in milligrams per kilogram (mg/kg)

theta hat (KM)	10538	theta star (KM)	7832
80% gamma percentile (KM)	243.6	90% gamma percentile (KM)	1330
95% gamma percentile (KM)	3395	99% gamma percentile (KM)	10711

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (3.89, α)	0.68	Adjusted Chi Square Value (3.89, β)	0.6
95% Gamma Approximate KM-UCL (use when n>=50)	3358	95% Gamma Adjusted KM-UCL (use when n<50)	3804

95% Gamma Adjusted KM-UCL (use when k<=1 and 15 < n < 50)

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.906	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.892	Detected Data appear Lognormal at 5% Significance Leve	
Lilliefors Test Statistic	0.2	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.207	Detected Data appear Lognormal at 5% Significance Leve	

Detected Data appear Lognormal at 5% Significance Leve

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	579.5	Mean in Log Scale	3.923
SD in Original Scale	2536	SD in Log Scale	1.724
95% t UCL (assumes normality of ROS data)	1429	95% Percentile Bootstrap UCL	1566
95% BCA Bootstrap UCL	2078	95% Bootstrap t UCL	26054
95% H-UCL (Log ROS)	764		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distributior

KM Mean (logged)	3.89	KM Geo Mean	48.9
KM SD (logged)	1.864	95% Critical H Value (KM-Log)	3.787
KM Standard Error of Mean (logged)	0.424	95% H-UCL (KM -Log)	1141
KM SD (logged)	1.864	95% Critical H Value (KM-Log)	3.787
KM Standard Error of Mean (logged)	0.424		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	611.4	Mean in Log Scale	4.297
SD in Original Scale	2530	SD in Log Scale	1.717
95% t UCL (Assumes normality)	1459	95% H-Stat UCL	1086

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Lognormal Distributed at 5% Significance Leve

Suggested UCL to Use

95% KM (Chebyshev) UCL	2777

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL

Recommendations are based upon data size, data distribution, and skewness

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statisticiar

APPENDIX B-1C2
PAHs in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH diesel and motor oil in milligrams per kilogram (mg/kg)

Pyrene

General Statistics

Total Number of Observations	26	Number of Distinct Observations	21
Number of Detects	25	Number of Non-Detects	1
Number of Distinct Detects	20	Number of Distinct Non-Detects	1
Minimum Detect	3.9	Minimum Non-Detect	84
Maximum Detect	4700	Maximum Non-Detect	84
Variance Detects	891269	Percent Non-Detects	3.85%
Mean Detects	513.9	SD Detects	944.1
Median Detects	190	CV Detects	1.837
Skewness Detects	3.932	Kurtosis Detects	17.34
Mean of Logged Detects	5.247	SD of Logged Detects	1.57

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.509	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.918	Detected Data Not Normal at 5% Significance Leve	
Lilliefors Test Statistic	0.295	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.173	Detected Data Not Normal at 5% Significance Leve	
Detected Data Not Normal at 5% Significance Leve			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	495.6	KM Standard Error of Mean	182.5
KM SD	911.7	95% KM (BCA) UCL	836.5
95% KM (t) UCL	807.3	95% KM (Percentile Bootstrap) UCL	839.6
95% KM (z) UCL	795.7	95% KM Bootstrap t UCL	1291
90% KM Chebyshev UCL	1043	95% KM Chebyshev UCL	1291
97.5% KM Chebyshev UCL	1635	99% KM Chebyshev UCL	2311

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.615	Anderson-Darling GOF Test	
5% A-D Critical Value	0.796	Detected data appear Gamma Distributed at 5% Significance Leve	
K-S Test Statistic	0.166	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.183	Detected data appear Gamma Distributed at 5% Significance Leve	
Detected data appear Gamma Distributed at 5% Significance Leve			

Gamma Statistics on Detected Data Only

k hat (MLE)	0.618	k star (bias corrected MLE)	0.571
Theta hat (MLE)	831.4	Theta star (bias corrected MLE)	900.6
nu hat (MLE)	30.9	nu star (bias corrected)	28.53
Mean (detects)	513.9		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	494.1
Maximum	4700	Median	190
SD	930.5	CV	1.883
k hat (MLE)	0.479	k star (bias corrected MLE)	0.449
Theta hat (MLE)	1032	Theta star (bias corrected MLE)	1100
nu hat (MLE)	24.91	nu star (bias corrected)	23.37
Adjusted Level of Significance (β)	0.0398		
Approximate Chi Square Value (23.37, α)	13.37	Adjusted Chi Square Value (23.37, β)	12.87
95% Gamma Approximate UCL (use when n>=50)	863.7	95% Gamma Adjusted UCL (use when n<50)	897.2

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	495.6	SD (KM)	911.7
Variance (KM)	831117	SE of Mean (KM)	182.5
k hat (KM)	0.295	k star (KM)	0.287
nu hat (KM)	15.37	nu star (KM)	14.93

APPENDIX B-1C2

PAHs in Soil - Zone 4

Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH diesel and motor oil in milligrams per kilogram (mg/kg)

theta hat (KM)	1677	theta star (KM)	1727
80% gamma percentile (KM)	751.4	90% gamma percentile (KM)	1469
95% gamma percentile (KM)	2299	99% gamma percentile (KM)	4468
Gamma Kaplan-Meier (KM) Statistics			
Approximate Chi Square Value (14.93, α)	7.21	Adjusted Chi Square Value (14.93, β)	6.857
95% Gamma Approximate KM-UCL (use when n>=50)	1026	95% Gamma Adjusted KM-UCL (use when n<50)	1079
Lognormal GOF Test on Detected Observations Only			
Shapiro Wilk Test Statistic	0.965	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.918	Detected Data appear Lognormal at 5% Significance Leve	
Lilliefors Test Statistic	0.124	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.173	Detected Data appear Lognormal at 5% Significance Leve	
Detected Data appear Lognormal at 5% Significance Leve			
Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	495.2	Mean in Log Scale	5.172
SD in Original Scale	929.9	SD in Log Scale	1.584
95% t UCL (assumes normality of ROS data)	806.7	95% Percentile Bootstrap UCL	824.2
95% BCA Bootstrap UCL	1051	95% Bootstrap t UCL	1345
95% H-UCL (Log ROS)	1783		
Statistics using KM estimates on Logged Data and Assuming Lognormal Distributior			
KM Mean (logged)	5.168	KM Geo Mean	175.6
KM SD (logged)	1.573	95% Critical H Value (KM-Log)	3.328
KM Standard Error of Mean (logged)	0.318	95% H-UCL (KM -Log)	1725
KM SD (logged)	1.573	95% Critical H Value (KM-Log)	3.328
KM Standard Error of Mean (logged)	0.318		
DL/2 Statistics			
DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	495.7	Mean in Log Scale	5.189
SD in Original Scale	929.6	SD in Log Scale	1.566
95% t UCL (Assumes normality)	807.1	95% H-Stat UCL	1727
DL/2 is not a recommended method, provided for comparisons and historical reasons			
Nonparametric Distribution Free UCL Statistics			
Detected Data appear Gamma Distributed at 5% Significance Leve			
Suggested UCL to Use			
Gamma Adjusted KM-UCL (use when k<=1 and 15 < n < 50 but	1079		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
Recommendations are based upon data size, data distribution, and skewness
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statisticiar

APPENDIX B-1C2

PAHs in Soil - Zone 4

Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH diesel and motor oil in milligrams per kilogram (mg/kg)

TPH-Diesel (C10-C28)

General Statistics			
Total Number of Observations	26	Number of Distinct Observations	24
		Number of Missing Observations	0
Minimum	22	Mean	1553
Maximum	15000	Median	600
SD	2994	Std. Error of Mean	587.2
Coefficient of Variation	1.928	Skewness	3.962
Normal GOF Test			
Shapiro Wilk Test Statistic	0.488	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.92	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.315	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.17	Data Not Normal at 5% Significance Level	
Data Not Normal at 5% Significance Level			
Assuming Normal Distribution			
95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	2556	95% Adjusted-CLT UCL (Chen-1995)	3006
		95% Modified-t UCL (Johnson-1978)	2632
Gamma GOF Test			
A-D Test Statistic	1.068	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.795	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.204	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.179	Data Not Gamma Distributed at 5% Significance Level	
Data Not Gamma Distributed at 5% Significance Level			
Gamma Statistics			
k hat (MLE)	0.644	k star (bias corrected MLE)	0.595
Theta hat (MLE)	2412	Theta star (bias corrected MLE)	2609
nu hat (MLE)	33.47	nu star (bias corrected)	30.94
MLE Mean (bias corrected)	1553	MLE Sd (bias corrected)	2013
		Approximate Chi Square Value (0.05)	19.23
Adjusted Level of Significance	0.0398	Adjusted Chi Square Value	18.62
Assuming Gamma Distribution			
95% Approximate Gamma UCL (use when n>=50))	2498	95% Adjusted Gamma UCL (use when n<50)	2579
Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.969	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.92	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.129	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.17	Data appear Lognormal at 5% Significance Level	
Data appear Lognormal at 5% Significance Level			
Lognormal Statistics			
Minimum of Logged Data	3.091	Mean of logged Data	6.398
Maximum of Logged Data	9.616	SD of logged Data	1.428
Assuming Lognormal Distribution			
95% H-UCL	4045	90% Chebyshev (MVUE) UCL	3147
95% Chebyshev (MVUE) UCL	3871	97.5% Chebyshev (MVUE) UCL	4875
99% Chebyshev (MVUE) UCL	6848		
Nonparametric Distribution Free UCL Statistics			
Data appear to follow a Discernible Distribution at 5% Significance Leve			
Nonparametric Distribution Free UCLs			
95% CLT UCL	2519	95% Jackknife UCL	2556
95% Standard Bootstrap UCL	2510	95% Bootstrap-t UCL	4450
95% Hall's Bootstrap UCL	5928	95% Percentile Bootstrap UCL	2625

APPENDIX B-1C2

PAHs in Soil - Zone 4

Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH diesel and motor oil in milligrams per kilogram (mg/kg)

95% BCA Bootstrap UCL	3182		
90% Chebyshev(Mean, Sd) UCL	3314	95% Chebyshev(Mean, Sd) UCL	4112
97.5% Chebyshev(Mean, Sd) UCL	5220	99% Chebyshev(Mean, Sd) UCL	7395

Suggested UCL to Use

95% H-UCL 4045

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
Recommendations are based upon data size, data distribution, and skewness
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statisticiar

ProUCL computes and outputs H-statistic based UCLs for historical reasons only
H-statistic often results in unstable (both high and low) values of UCL95 as shown in examples in the Technical Guide
It is therefore recommended to avoid the use of H-statistic based 95% UCLs
Use of nonparametric methods are preferred to compute UCL95 for skewed data sets which do not follow a gamma distribution

APPENDIX B-1C2

PAHs in Soil - Zone 4

Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH diesel and motor oil in milligrams per kilogram (mg/kg)

TPH-Motor Oil (C24-C36)

General Statistics

Total Number of Observations	26	Number of Distinct Observations	24
		Number of Missing Observations	0
Minimum	79	Mean	2607
Maximum	17000	Median	1150
SD	3745	Std. Error of Mean	734.5
Coefficient of Variation	1.437	Skewness	2.622

Normal GOF Test

Shapiro Wilk Test Statistic	0.674	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.92	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.26	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.17	Data Not Normal at 5% Significance Level	
Data Not Normal at 5% Significance Level			

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	3862	95% Adjusted-CLT UCL (Chen-1995)	4219
		95% Modified-t UCL (Johnson-1978)	3925

Gamma GOF Test

A-D Test Statistic	0.532	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.789	Detected data appear Gamma Distributed at 5% Significance Leve	
K-S Test Statistic	0.156	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.179	Detected data appear Gamma Distributed at 5% Significance Leve	
Detected data appear Gamma Distributed at 5% Significance Leve			

Gamma Statistics

k hat (MLE)	0.697	k star (bias corrected MLE)	0.642
Theta hat (MLE)	3741	Theta star (bias corrected MLE)	4060
nu hat (MLE)	36.24	nu star (bias corrected)	33.39
MLE Mean (bias corrected)	2607	MLE Sd (bias corrected)	3254
		Approximate Chi Square Value (0.05)	21.18
Adjusted Level of Significance	0.0398	Adjusted Chi Square Value	20.54

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50)	4111	95% Adjusted Gamma UCL (use when n<50)	4239

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.977	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.92	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.0789	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.17	Data appear Lognormal at 5% Significance Level	
Data appear Lognormal at 5% Significance Level			

Lognormal Statistics

Minimum of Logged Data	4.369	Mean of logged Data	6.998
Maximum of Logged Data	9.741	SD of logged Data	1.421

Assuming Lognormal Distribution

95% H-UCL	7249	90% Chebyshev (MVUE) UCL	5670
95% Chebyshev (MVUE) UCL	6970	97.5% Chebyshev (MVUE) UCL	8774
99% Chebyshev (MVUE) UCL	12318		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Leve

Nonparametric Distribution Free UCLs

95% CLT UCL	3815	95% Jackknife UCL	3862
95% Standard Bootstrap UCL	3801	95% Bootstrap-t UCL	4721
95% Hall's Bootstrap UCL	5936	95% Percentile Bootstrap UCL	3940

APPENDIX B-1C2

PAHs in Soil - Zone 4

Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH diesel and motor oil in milligrams per kilogram (mg/kg)

95% BCA Bootstrap UCL	4388		
90% Chebyshev(Mean, Sd) UCL	4811	95% Chebyshev(Mean, Sd) UCL	5809
97.5% Chebyshev(Mean, Sd) UCL	7195	99% Chebyshev(Mean, Sd) UCL	9916

Suggested UCL to Use

95% Adjusted Gamma UCL 4239

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
Recommendations are based upon data size, data distribution, and skewness
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statisticiar

APPENDIX B-1D1
VOCs and TPH in Soil - All Areas except for Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH mg/kg

111TCA

General Statistics

Total Number of Observations	283	Number of Distinct Observations	57
Number of Detects	0	Number of Non-Detects	283
Number of Distinct Detects	0	Number of Distinct Non-Detects	57

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable A was not processed!

APPENDIX B-1D1
VOCs and TPH in Soil - All Areas except for Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH mg/kg

112TC122TF

General Statistics

Total Number of Observations	283	Number of Distinct Observations	58
Number of Detects	1	Number of Non-Detects	282
Number of Distinct Detects	1	Number of Distinct Non-Detects	57

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!
It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable B was not processed!

APPENDIX B-1D1
VOCs and TPH in Soil - All Areas except for Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH mg/kg

11DCA

General Statistics

Total Number of Observations	283	Number of Distinct Observations	57
Number of Detects	0	Number of Non-Detects	283
Number of Distinct Detects	0	Number of Distinct Non-Detects	57

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV)

The data set for variable C was not processed!

APPENDIX B-1D1
VOCs and TPH in Soil - All Areas except for Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH mg/kg

124TMB

General Statistics			
Total Number of Observations	283	Number of Distinct Observations	65
Number of Detects	7	Number of Non-Detects	276
Number of Distinct Detects	7	Number of Distinct Non-Detects	58
Minimum Detect	2.9	Minimum Non-Detect	0.36
Maximum Detect	11000	Maximum Non-Detect	270
Variance Detects	16159565	Percent Non-Detects	97.53%
Mean Detects	1921	SD Detects	4020
Median Detects	450	CV Detects	2.092
Skewness Detects	2.601	Kurtosis Detects	6.815
Mean of Logged Detects	5.643	SD of Logged Detects	2.567

Normal GOF Test on Detects Only			
Shapiro Wilk Test Statistic	0.535	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.803	Detected Data Not Normal at 5% Significance Leve	
Lilliefors Test Statistic	0.438	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.304	Detected Data Not Normal at 5% Significance Leve	
Detected Data Not Normal at 5% Significance Leve			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
KM Mean	47.87	KM Standard Error of Mean	42.18
KM SD	657	95% KM (BCA) UCL	131.1
95% KM (t) UCL	117.5	95% KM (Percentile Bootstrap) UCL	124.1
95% KM (z) UCL	117.3	95% KM Bootstrap t UCL	604.1
90% KM Chebyshev UCL	174.4	95% KM Chebyshev UCL	231.7
97.5% KM Chebyshev UCL	311.3	99% KM Chebyshev UCL	467.6

Gamma GOF Tests on Detected Observations Only			
A-D Test Statistic	0.419	Anderson-Darling GOF Test	
5% A-D Critical Value	0.776	Detected data appear Gamma Distributed at 5% Significance Leve	
K-S Test Statistic	0.249	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.333	Detected data appear Gamma Distributed at 5% Significance Leve	
Detected data appear Gamma Distributed at 5% Significance Leve			

Gamma Statistics on Detected Data Only			
k hat (MLE)	0.351	k star (bias corrected MLE)	0.296
Theta hat (MLE)	5481	Theta star (bias corrected MLE)	6500
nu hat (MLE)	4.907	nu star (bias corrected)	4.138
Mean (detects)	1921		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	47.53
Maximum	11000	Median	0.01
SD	658.2	CV	13.85
k hat (MLE)	0.099	k star (bias corrected MLE)	0.1
Theta hat (MLE)	480.1	Theta star (bias corrected MLE)	473.8
nu hat (MLE)	56.04	nu star (bias corrected)	56.78
Adjusted Level of Significance (β)	0.0492		
Approximate Chi Square Value (56.78, α)	40.46	Adjusted Chi Square Value (56.78, β)	40.39
95% Gamma Approximate UCL (use when n>=50)	66.7	95% Gamma Adjusted UCL (use when n<50)	66.82

Estimates of Gamma Parameters using KM Estimates			
Mean (KM)	47.87	SD (KM)	657
Variance (KM)	431604	SE of Mean (KM)	42.18
k hat (KM)	0.00531	k star (KM)	0.00761
nu hat (KM)	3.005	nu star (KM)	4.307

APPENDIX B-1D1
VOCs and TPH in Soil - All Areas except for Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH mg/kg

theta hat (KM)	9016	theta star (KM)	6291
80% gamma percentile (KM)	6.54E-10	90% gamma percentile (KM)	0.00345
95% gamma percentile (KM)	4.203	99% gamma percentile (KM)	1124

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (4.31, α)	0.847	Adjusted Chi Square Value (4.31, β)	0.839
95% Gamma Approximate KM-UCL (use when n>=50)	243.6	95% Gamma Adjusted KM-UCL (use when n<50)	245.7

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.948	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.803	Detected Data appear Lognormal at 5% Significance Leve	
Lilliefors Test Statistic	0.229	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.304	Detected Data appear Lognormal at 5% Significance Leve	
Detected Data appear Lognormal at 5% Significance Leve			

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	47.52	Mean in Log Scale	-14.67
SD in Original Scale	658.2	SD in Log Scale	6.776
95% t UCL (assumes normality of ROS data)	112.1	95% Percentile Bootstrap UCL	124.9
95% BCA Bootstrap UCL	169.6	95% Bootstrap t UCL	809
95% H-UCL (Log ROS)	156424		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distributior

KM Mean (logged)	-0.856	KM Geo Mean	0.425
KM SD (logged)	1.101	95% Critical H Value (KM-Log)	2.22
KM Standard Error of Mean (logged)	0.0708	95% H-UCL (KM -Log)	0.901
KM SD (logged)	1.101	95% Critical H Value (KM-Log)	2.22
KM Standard Error of Mean (logged)	0.0708		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	49.29	Mean in Log Scale	-0.641
SD in Original Scale	658.1	SD in Log Scale	1.296
95% t UCL (Assumes normality)	113.9	95% H-Stat UCL	1.468

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Detected Data appear Gamma Distributed at 5% Significance Leve

Suggested UCL to Use

95% KM Approximate Gamma UCL	243.6

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
Recommendations are based upon data size, data distribution, and skewness
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statisticiar

APPENDIX B-1D1
VOCs and TPH in Soil - All Areas except for Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH mg/kg

135TMB

General Statistics			
Total Number of Observations	283	Number of Distinct Observations	63
Number of Detects	7	Number of Non-Detects	276
Number of Distinct Detects	7	Number of Distinct Non-Detects	58
Minimum Detect	1	Minimum Non-Detect	0.36
Maximum Detect	6000	Maximum Non-Detect	270
Variance Detects	4889127	Percent Non-Detects	97.53%
Mean Detects	994.6	SD Detects	2211
Median Detects	150	CV Detects	2.223
Skewness Detects	2.626	Kurtosis Detects	6.92
Mean of Logged Detects	4.81	SD of Logged Detects	2.631

Normal GOF Test on Detects Only		
Shapiro Wilk Test Statistic	0.509	Shapiro Wilk GOF Test
5% Shapiro Wilk Critical Value	0.803	Detected Data Not Normal at 5% Significance Leve
Lilliefors Test Statistic	0.472	Lilliefors GOF Test
5% Lilliefors Critical Value	0.304	Detected Data Not Normal at 5% Significance Leve
Detected Data Not Normal at 5% Significance Leve		

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
KM Mean	24.96	KM Standard Error of Mean	22.93
KM SD	357.1	95% KM (BCA) UCL	68.44
95% KM (t) UCL	62.8	95% KM (Percentile Bootstrap) UCL	66.68
95% KM (z) UCL	62.67	95% KM Bootstrap t UCL	385.2
90% KM Chebyshev UCL	93.74	95% KM Chebyshev UCL	124.9
97.5% KM Chebyshev UCL	168.1	99% KM Chebyshev UCL	253.1

Gamma GOF Tests on Detected Observations Only		
A-D Test Statistic	0.534	Anderson-Darling GOF Test
5% A-D Critical Value	0.78	Detected data appear Gamma Distributed at 5% Significance Leve
K-S Test Statistic	0.319	Kolmogorov-Smirnov GOF
5% K-S Critical Value	0.334	Detected data appear Gamma Distributed at 5% Significance Leve
Detected data appear Gamma Distributed at 5% Significance Leve		

Gamma Statistics on Detected Data Only			
k hat (MLE)	0.325	k star (bias corrected MLE)	0.281
Theta hat (MLE)	3058	Theta star (bias corrected MLE)	3538
nu hat (MLE)	4.553	nu star (bias corrected)	3.935
Mean (detects)	994.6		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	24.61
Maximum	6000	Median	0.01
SD	357.7	CV	14.54
k hat (MLE)	0.106	k star (bias corrected MLE)	0.108
Theta hat (MLE)	231.4	Theta star (bias corrected MLE)	228.7
nu hat (MLE)	60.2	nu star (bias corrected)	60.9
Adjusted Level of Significance (β)	0.0492		
Approximate Chi Square Value (60.90, α)	43.95	Adjusted Chi Square Value (60.90, β)	43.88
95% Gamma Approximate UCL (use when n>=50)	34.1	95% Gamma Adjusted UCL (use when n<50)	34.16

Estimates of Gamma Parameters using KM Estimates			
Mean (KM)	24.96	SD (KM)	357.1
Variance (KM)	127502	SE of Mean (KM)	22.93
k hat (KM)	0.00489	k star (KM)	0.00719
nu hat (KM)	2.766	nu star (KM)	4.07

APPENDIX B-1D1
VOCs and TPH in Soil - All Areas except for Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH mg/kg

theta hat (KM)	5108	theta star (KM)	3471
80% gamma percentile (KM)	6.54E-11	90% gamma percentile (KM)	8.49E-04
95% gamma percentile (KM)	1.566	99% gamma percentile (KM)	566.2

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (4.07, α)	0.75	Adjusted Chi Square Value (4.07, β)	0.743
95% Gamma Approximate KM-UCL (use when n>=50)	135.5	95% Gamma Adjusted KM-UCL (use when n<50)	136.8

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.935	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.803	Detected Data appear Lognormal at 5% Significance Leve	
Lilliefors Test Statistic	0.202	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.304	Detected Data appear Lognormal at 5% Significance Leve	
Detected Data appear Lognormal at 5% Significance Leve			

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	24.6	Mean in Log Scale	-13.99
SD in Original Scale	357.7	SD in Log Scale	6.257
95% t UCL (assumes normality of ROS data)	59.69	95% Percentile Bootstrap UCL	66.82
95% BCA Bootstrap UCL	110.5	95% Bootstrap t UCL	451.2
95% H-UCL (Log ROS)	6161		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distributior

KM Mean (logged)	-0.876	KM Geo Mean	0.416
KM SD (logged)	0.985	95% Critical H Value (KM-Log)	2.123
KM Standard Error of Mean (logged)	0.0634	95% H-UCL (KM -Log)	0.766
KM SD (logged)	0.985	95% Critical H Value (KM-Log)	2.123
KM Standard Error of Mean (logged)	0.0634		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	26.37	Mean in Log Scale	-0.661
SD in Original Scale	357.8	SD in Log Scale	1.201
95% t UCL (Assumes normality)	61.47	95% H-Stat UCL	1.253

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Detected Data appear Gamma Distributed at 5% Significance Leve

Suggested UCL to Use

95% KM Approximate Gamma UCL	135.5

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
Recommendations are based upon data size, data distribution, and skewness
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statisticiar

APPENDIX B-1D1
VOCs and TPH in Soil - All Areas except for Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH mg/kg

2Butanone

General Statistics

Total Number of Observations	284	Number of Distinct Observations	71
Number of Detects	27	Number of Non-Detects	257
Number of Distinct Detects	21	Number of Distinct Non-Detects	54
Minimum Detect	4.2	Minimum Non-Detect	2.1
Maximum Detect	77	Maximum Non-Detect	2700
Variance Detects	326.8	Percent Non-Detects	90.49%
Mean Detects	20.1	SD Detects	18.08
Median Detects	16	CV Detects	0.9
Skewness Detects	2.339	Kurtosis Detects	5.671
Mean of Logged Detects	2.72	SD of Logged Detects	0.737

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.71	Shapiro Wilk GOF Test
5% Shapiro Wilk Critical Value	0.923	Detected Data Not Normal at 5% Significance Leve
Lilliefors Test Statistic	0.236	Lilliefors GOF Test
5% Lilliefors Critical Value	0.167	Detected Data Not Normal at 5% Significance Leve
Detected Data Not Normal at 5% Significance Leve		

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	3.894	KM Standard Error of Mean	0.479
KM SD	7.758	95% KM (BCA) UCL	5.374
95% KM (t) UCL	4.685	95% KM (Percentile Bootstrap) UCL	5.142
95% KM (z) UCL	4.683	95% KM Bootstrap t UCL	4.827
90% KM Chebyshev UCL	5.333	95% KM Chebyshev UCL	5.984
97.5% KM Chebyshev UCL	6.888	99% KM Chebyshev UCL	8.665

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.672	Anderson-Darling GOF Test
5% A-D Critical Value	0.757	Detected data appear Gamma Distributed at 5% Significance Leve
K-S Test Statistic	0.134	Kolmogorov-Smirnov GOF
5% K-S Critical Value	0.171	Detected data appear Gamma Distributed at 5% Significance Leve
Detected data appear Gamma Distributed at 5% Significance Leve		

Gamma Statistics on Detected Data Only

k hat (MLE)	1.933	k star (bias corrected MLE)	1.743
Theta hat (MLE)	10.4	Theta star (bias corrected MLE)	11.53
nu hat (MLE)	104.4	nu star (bias corrected)	94.13
Mean (detects)	20.1		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	1.92
Maximum	77	Median	0.01
SD	8.053	CV	4.195
k hat (MLE)	0.166	k star (bias corrected MLE)	0.167
Theta hat (MLE)	11.56	Theta star (bias corrected MLE)	11.52
nu hat (MLE)	94.3	nu star (bias corrected)	94.63
Adjusted Level of Significance (β)	0.0492		
Approximate Chi Square Value (94.63, α)	73.2	Adjusted Chi Square Value (94.63, β)	73.1
95% Gamma Approximate UCL (use when n>=50)	2.482	95% Gamma Adjusted UCL (use when n<50)	2.485

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	3.894	SD (KM)	7.758
Variance (KM)	60.19	SE of Mean (KM)	0.479
k hat (KM)	0.252	k star (KM)	0.252
nu hat (KM)	143.1	nu star (KM)	142.9

APPENDIX B-1D1
VOCs and TPH in Soil - All Areas except for Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH mg/kg

theta hat (KM)	15.46	theta star (KM)	15.48
80% gamma percentile (KM)	5.669	90% gamma percentile (KM)	11.68
95% gamma percentile (KM)	18.81	99% gamma percentile (KM)	37.77

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (142.93, α)	116.3	Adjusted Chi Square Value (142.93, β)	116.2
95% Gamma Approximate KM-UCL (use when n>=50)	4.786	95% Gamma Adjusted KM-UCL (use when n<50)	4.791

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.963	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.923	Detected Data appear Lognormal at 5% Significance Leve	
Lilliefors Test Statistic	0.0852	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.167	Detected Data appear Lognormal at 5% Significance Leve	
Detected Data appear Lognormal at 5% Significance Leve			

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	2.601	Mean in Log Scale	-0.593
SD in Original Scale	7.937	SD in Log Scale	1.628
95% t UCL (assumes normality of ROS data)	3.378	95% Percentile Bootstrap UCL	3.403
95% BCA Bootstrap UCL	3.586	95% Bootstrap t UCL	3.678
95% H-UCL (Log ROS)	2.708		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distributior

KM Mean (logged)	0.941	KM Geo Mean	2.562
KM SD (logged)	0.635	95% Critical H Value (KM-Log)	1.873
KM Standard Error of Mean (logged)	0.0393	95% H-UCL (KM -Log)	3.363
KM SD (logged)	0.635	95% Critical H Value (KM-Log)	1.873
KM Standard Error of Mean (logged)	0.0393		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	25.15	Mean in Log Scale	1.124
SD in Original Scale	127.6	SD in Log Scale	1.225
95% t UCL (Assumes normality)	37.65	95% H-Stat UCL	7.717

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Detected Data appear Gamma Distributed at 5% Significance Leve

Suggested UCL to Use

95% KM Approximate Gamma UCL	4.786	95% GROS Approximate Gamma UCL	2.482

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
Recommendations are based upon data size, data distribution, and skewness
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statisticiar

APPENDIX B-1D1
VOCs and TPH in Soil - All Areas except for Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH mg/kg

4Isopropyltoluene

General Statistics

Total Number of Observations	283	Number of Distinct Observations	59
Number of Detects	8	Number of Non-Detects	275
Number of Distinct Detects	8	Number of Distinct Non-Detects	53
Minimum Detect	0.44	Minimum Non-Detect	0.18
Maximum Detect	2000	Maximum Non-Detect	270
Variance Detects	465525	Percent Non-Detects	97.17%
Mean Detects	441.5	SD Detects	682.3
Median Detects	155	CV Detects	1.546
Skewness Detects	2.1	Kurtosis Detects	4.646
Mean of Logged Detects	3.563	SD of Logged Detects	3.59

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.716	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.818	Detected Data Not Normal at 5% Significance Leve	
Lilliefors Test Statistic	0.274	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.283	Detected Data appear Normal at 5% Significance Leve	
Detected Data appear Approximate Normal at 5% Significance Leve			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	12.66	KM Standard Error of Mean	8.253
KM SD	129.9	95% KM (BCA) UCL	29.95
95% KM (t) UCL	26.28	95% KM (Percentile Bootstrap) UCL	26.55
95% KM (z) UCL	26.24	95% KM Bootstrap t UCL	51.12
90% KM Chebyshev UCL	37.42	95% KM Chebyshev UCL	48.64
97.5% KM Chebyshev UCL	64.2	99% KM Chebyshev UCL	94.78

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.462	Anderson-Darling GOF Test	
5% A-D Critical Value	0.806	Detected data appear Gamma Distributed at 5% Significance Leve	
K-S Test Statistic	0.244	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.318	Detected data appear Gamma Distributed at 5% Significance Leve	
Detected data appear Gamma Distributed at 5% Significance Leve			

Gamma Statistics on Detected Data Only

k hat (MLE)	0.276	k star (bias corrected MLE)	0.256
Theta hat (MLE)	1597	Theta star (bias corrected MLE)	1723
nu hat (MLE)	4.424	nu star (bias corrected)	4.098
Mean (detects)	441.5		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	12.49
Maximum	2000	Median	0.01
SD	130.1	CV	10.42
k hat (MLE)	0.116	k star (bias corrected MLE)	0.117
Theta hat (MLE)	108.1	Theta star (bias corrected MLE)	107.1
nu hat (MLE)	65.39	nu star (bias corrected)	66.03
Adjusted Level of Significance (β)	0.0492		
Approximate Chi Square Value (66.03, α)	48.33	Adjusted Chi Square Value (66.03, β)	48.26
95% Gamma Approximate UCL (use when n>=50)	17.06	95% Gamma Adjusted UCL (use when n<50)	17.09

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	12.66	SD (KM)	129.9
Variance (KM)	16865	SE of Mean (KM)	8.253
k hat (KM)	0.00951	k star (KM)	0.0118
nu hat (KM)	5.383	nu star (KM)	6.659

APPENDIX B-1D1
VOCs and TPH in Soil - All Areas except for Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH mg/kg

theta hat (KM)	1332	theta star (KM)	1076
80% gamma percentile (KM)	3.53E-06	90% gamma percentile (KM)	0.0787
95% gamma percentile (KM)	7.855	99% gamma percentile (KM)	349.5

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (6.66, α)	1.985	Adjusted Chi Square Value (6.66, β)	1.972
95% Gamma Approximate KM-UCL (use when n>=50)	42.48	95% Gamma Adjusted KM-UCL (use when n<50)	42.75

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.818	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.818	Detected Data Not Lognormal at 5% Significance Leve	
Lilliefors Test Statistic	0.267	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.283	Detected Data appear Lognormal at 5% Significance Leve	

Detected Data appear Approximate Lognormal at 5% Significance Leve

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	12.48	Mean in Log Scale	-20.1
SD in Original Scale	130.1	SD in Log Scale	8.559
95% t UCL (assumes normality of ROS data)	25.24	95% Percentile Bootstrap UCL	27.5
95% BCA Bootstrap UCL	37.54	95% Bootstrap t UCL	71.25
95% H-UCL (Log ROS)	5.17E+09		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distributior

KM Mean (logged)	-1.563	KM Geo Mean	0.21
KM SD (logged)	1.043	95% Critical H Value (KM-Log)	2.171
KM Standard Error of Mean (logged)	0.0665	95% H-UCL (KM -Log)	0.413
KM SD (logged)	1.043	95% Critical H Value (KM-Log)	2.171
KM Standard Error of Mean (logged)	0.0665		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	14.27	Mean in Log Scale	-1.299
SD in Original Scale	130.5	SD in Log Scale	1.363
95% t UCL (Assumes normality)	27.07	95% H-Stat UCL	0.843

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Detected Data appear Approximate Normal Distributed at 5% Significance Leve

Suggested UCL to Use

95% KM (t) UCL	26.28

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF tes
When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCI

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
Recommendations are based upon data size, data distribution, and skewness
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician

APPENDIX B-1D1
VOCs and TPH in Soil - All Areas except for Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH mg/kg

4Methyl2pentanone

General Statistics

Total Number of Observations	282	Number of Distinct Observations	42
Number of Detects	1	Number of Non-Detects	281
Number of Distinct Detects	1	Number of Distinct Non-Detects	41

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set
It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV)

The data set for variable H was not processed!

APPENDIX B-1D1
VOCs and TPH in Soil - All Areas except for Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH mg/kg

Benzene

General Statistics

Total Number of Observations	283	Number of Distinct Observations	66
Number of Detects	20	Number of Non-Detects	263
Number of Distinct Detects	19	Number of Distinct Non-Detects	54
Minimum Detect	0.35	Minimum Non-Detect	0.18
Maximum Detect	2300	Maximum Non-Detect	270
Variance Detects	268559	Percent Non-Detects	92.93%
Mean Detects	139.7	SD Detects	518.2
Median Detects	1.2	CV Detects	3.71
Skewness Detects	4.229	Kurtosis Detects	18.29
Mean of Logged Detects	0.954	SD of Logged Detects	2.275

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.301	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.905	Detected Data Not Normal at 5% Significance Leve	
Lilliefors Test Statistic	0.495	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.192	Detected Data Not Normal at 5% Significance Leve	
Detected Data Not Normal at 5% Significance Leve			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	10.05	KM Standard Error of Mean	8.475
KM SD	139	95% KM (BCA) UCL	26.26
95% KM (t) UCL	24.03	95% KM (Percentile Bootstrap) UCL	26.28
95% KM (z) UCL	23.99	95% KM Bootstrap t UCL	1853
90% KM Chebyshev UCL	35.47	95% KM Chebyshev UCL	46.99
97.5% KM Chebyshev UCL	62.97	99% KM Chebyshev UCL	94.37

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	4.382	Anderson-Darling GOF Test	
5% A-D Critical Value	0.905	Detected Data Not Gamma Distributed at 5% Significance Leve	
K-S Test Statistic	0.396	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.216	Detected Data Not Gamma Distributed at 5% Significance Leve	
Detected Data Not Gamma Distributed at 5% Significance Leve			

Gamma Statistics on Detected Data Only

k hat (MLE)	0.187	k star (bias corrected MLE)	0.192
Theta hat (MLE)	748.4	Theta star (bias corrected MLE)	727.6
nu hat (MLE)	7.465	nu star (bias corrected)	7.679
Mean (detects)	139.7		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	9.88
Maximum	2300	Median	0.01
SD	139.2	CV	14.09
k hat (MLE)	0.122	k star (bias corrected MLE)	0.123
Theta hat (MLE)	81.18	Theta star (bias corrected MLE)	80.47
nu hat (MLE)	68.89	nu star (bias corrected)	69.49
Adjusted Level of Significance (β)	0.0492		
Approximate Chi Square Value (69.49, α)	51.3	Adjusted Chi Square Value (69.49, β)	51.22
95% Gamma Approximate UCL (use when n>=50)	13.38	95% Gamma Adjusted UCL (use when n<50)	13.4

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	10.05	SD (KM)	139
Variance (KM)	19308	SE of Mean (KM)	8.475
k hat (KM)	0.00523	k star (KM)	0.00753
nu hat (KM)	2.959	nu star (KM)	4.261

APPENDIX B-1D1
VOCs and TPH in Soil - All Areas except for Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH mg/kg

theta hat (KM)	1922	theta star (KM)	1335
80% gamma percentile (KM)	1.01E-10	90% gamma percentile (KM)	6.29E-04
95% gamma percentile (KM)	0.828	99% gamma percentile (KM)	234.5
Gamma Kaplan-Meier (KM) Statistics			
Approximate Chi Square Value (4.26, α)	0.827	Adjusted Chi Square Value (4.26, β)	0.82
95% Gamma Approximate KM-UCL (use when n>=50)	51.74	95% Gamma Adjusted KM-UCL (use when n<50)	52.2
Lognormal GOF Test on Detected Observations Only			
Shapiro Wilk Test Statistic	0.739	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.905	Detected Data Not Lognormal at 5% Significance Leve	
Lilliefors Test Statistic	0.229	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.192	Detected Data Not Lognormal at 5% Significance Leve	
Detected Data Not Lognormal at 5% Significance Leve			
Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	9.873	Mean in Log Scale	-9.83
SD in Original Scale	139.2	SD in Log Scale	4.847
95% t UCL (assumes normality of ROS data)	23.53	95% Percentile Bootstrap UCL	26.1
95% BCA Bootstrap UCL	40.74	95% Bootstrap t UCL	1806
95% H-UCL (Log ROS)	46.02		
Statistics using KM estimates on Logged Data and Assuming Lognormal Distributior			
KM Mean (logged)	-1.512	KM Geo Mean	0.22
KM SD (logged)	0.91	95% Critical H Value (KM-Log)	2.063
KM Standard Error of Mean (logged)	0.0566	95% H-UCL (KM -Log)	0.373
KM SD (logged)	0.91	95% Critical H Value (KM-Log)	2.063
KM Standard Error of Mean (logged)	0.0566		
DL/2 Statistics			
DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	11.97	Mean in Log Scale	-1.235
SD in Original Scale	139.6	SD in Log Scale	1.319
95% t UCL (Assumes normality)	25.66	95% H-Stat UCL	0.839
DL/2 is not a recommended method, provided for comparisons and historical reasons			
Nonparametric Distribution Free UCL Statistics			
Data do not follow a Discernible Distribution at 5% Significance Leve			
Suggested UCL to Use			
95% KM (Chebyshev) UCL	46.99		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
Recommendations are based upon data size, data distribution, and skewness
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statisticiar

APPENDIX B-1D1
VOCs and TPH in Soil - All Areas except for Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH mg/kg

Carbon disulfide

General Statistics			
Total Number of Observations	283	Number of Distinct Observations	66
Number of Detects	8	Number of Non-Detects	275
Number of Distinct Detects	8	Number of Distinct Non-Detects	63
Minimum Detect	1.1	Minimum Non-Detect	0.36
Maximum Detect	3.7	Maximum Non-Detect	680
Variance Detects	0.961	Percent Non-Detects	97.17%
Mean Detects	1.988	SD Detects	0.98
Median Detects	1.6	CV Detects	0.493
Skewness Detects	1.163	Kurtosis Detects	-0.167
Mean of Logged Detects	0.593	SD of Logged Detects	0.448

Normal GOF Test on Detects Only			
Shapiro Wilk Test Statistic	0.823	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.818	Detected Data appear Normal at 5% Significance Leve	
Lilliefors Test Statistic	0.245	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.283	Detected Data appear Normal at 5% Significance Leve	
Detected Data appear Normal at 5% Significance Leve			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
KM Mean	0.409	KM Standard Error of Mean	0.0207
KM SD	0.318	95% KM (BCA) UCL	0.617
95% KM (t) UCL	0.443	95% KM (Percentile Bootstrap) UCL	0.603
95% KM (z) UCL	0.443	95% KM Bootstrap t UCL	0.443
90% KM Chebyshev UCL	0.471	95% KM Chebyshev UCL	0.499
97.5% KM Chebyshev UCL	0.538	99% KM Chebyshev UCL	0.615

Gamma GOF Tests on Detected Observations Only			
A-D Test Statistic	0.518	Anderson-Darling GOF Test	
5% A-D Critical Value	0.719	Detected data appear Gamma Distributed at 5% Significance Leve	
K-S Test Statistic	0.209	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.295	Detected data appear Gamma Distributed at 5% Significance Leve	
Detected data appear Gamma Distributed at 5% Significance Leve			

Gamma Statistics on Detected Data Only			
k hat (MLE)	5.499	k star (bias corrected MLE)	3.52
Theta hat (MLE)	0.361	Theta star (bias corrected MLE)	0.565
nu hat (MLE)	87.98	nu star (bias corrected)	56.32
Mean (detects)	1.988		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.0659
Maximum	3.7	Median	0.01
SD	0.363	CV	5.506
k hat (MLE)	0.381	k star (bias corrected MLE)	0.38
Theta hat (MLE)	0.173	Theta star (bias corrected MLE)	0.174
nu hat (MLE)	215.9	nu star (bias corrected)	214.9
Adjusted Level of Significance (β)	0.0492		
Approximate Chi Square Value (214.92, α)	182	Adjusted Chi Square Value (214.92, β)	181.8
95% Gamma Approximate UCL (use when n>=50)	0.0778	95% Gamma Adjusted UCL (use when n<50)	0.0779

Estimates of Gamma Parameters using KM Estimates			
Mean (KM)	0.409	SD (KM)	0.318
Variance (KM)	0.101	SE of Mean (KM)	0.0207
k hat (KM)	1.65	k star (KM)	1.635
nu hat (KM)	934.1	nu star (KM)	925.5

APPENDIX B-1D1
VOCs and TPH in Soil - All Areas except for Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH mg/kg

theta hat (KM)	0.248	theta star (KM)	0.25
80% gamma percentile (KM)	0.626	90% gamma percentile (KM)	0.834
95% gamma percentile (KM)	1.034	99% gamma percentile (KM)	1.484

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (925.53, α)	855.9	Adjusted Chi Square Value (925.53, β)	855.6
95% Gamma Approximate KM-UCL (use when n>=50)	0.442	95% Gamma Adjusted KM-UCL (use when n<50)	0.442

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.899	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.818	Detected Data appear Lognormal at 5% Significance Leve	
Lilliefors Test Statistic	0.181	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.283	Detected Data appear Lognormal at 5% Significance Leve	
Detected Data appear Lognormal at 5% Significance Leve			

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.15	Mean in Log Scale	-2.68
SD in Original Scale	0.361	SD in Log Scale	1.112
95% t UCL (assumes normality of ROS data)	0.185	95% Percentile Bootstrap UCL	0.185
95% BCA Bootstrap UCL	0.198	95% Bootstrap t UCL	0.203
95% H-UCL (Log ROS)	0.147		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distributior

KM Mean (logged)	-0.973	KM Geo Mean	0.378
KM SD (logged)	0.284	95% Critical H Value (KM-Log)	1.708
KM Standard Error of Mean (logged)	0.0186	95% H-UCL (KM -Log)	0.405
KM SD (logged)	0.284	95% Critical H Value (KM-Log)	1.708
KM Standard Error of Mean (logged)	0.0186		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	5.833	Mean in Log Scale	-0.628
SD in Original Scale	32.07	SD in Log Scale	1.158
95% t UCL (Assumes normality)	8.979	95% H-Stat UCL	1.221
DL/2 is not a recommended method, provided for comparisons and historical reasons			

Nonparametric Distribution Free UCL Statistics
Detected Data appear Normal Distributed at 5% Significance Leve

Suggested UCL to Use

95% KM (t) UCL	0.443

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
Recommendations are based upon data size, data distribution, and skewness
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statisticiar

APPENDIX B-1D1
VOCs and TPH in Soil - All Areas except for Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH mg/kg

Chloroethane

General Statistics

Total Number of Observations	283	Number of Distinct Observations	64
Number of Detects	0	Number of Non-Detects	283
Number of Distinct Detects	0	Number of Distinct Non-Detects	64

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV)

The data set for variable K was not processed!

APPENDIX B-1D1
VOCs and TPH in Soil - All Areas except for Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH mg/kg

Chloroform

General Statistics

Total Number of Observations	283	Number of Distinct Observations	57
Number of Detects	1	Number of Non-Detects	282
Number of Distinct Detects	1	Number of Distinct Non-Detects	56

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set
It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV)

The data set for variable L was not processed!

APPENDIX B-1D1
VOCs and TPH in Soil - All Areas except for Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH mg/kg

cis1,2Dichloroethene

General Statistics

Total Number of Observations	283	Number of Distinct Observations	58
Number of Detects	2	Number of Non-Detects	281
Number of Distinct Detects	2	Number of Distinct Non-Detects	56
Minimum Detect	0.27	Minimum Non-Detect	0.18
Maximum Detect	0.75	Maximum Non-Detect	270
Variance Detects	0.115	Percent Non-Detects	99.29%
Mean Detects	0.51	SD Detects	0.339
Median Detects	0.51	CV Detects	0.666
Skewness Detects	N/A	Kurtosis Detects	N/A
Mean of Logged Detects	-0.799	SD of Logged Detects	0.722

Warning: Data set has only 2 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates

Normal GOF Test on Detects Only
Not Enough Data to Perform GOF Test

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.212	KM Standard Error of Mean	0.0346
KM SD	0.0537	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.269	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.269	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.316	95% KM Chebyshev UCL	0.363
97.5% KM Chebyshev UCL	0.428	99% KM Chebyshev UCL	0.557

Gamma GOF Tests on Detected Observations Only
Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	4.154	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.123	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	16.62	nu star (bias corrected)	N/A
Mean (detects)	0.51		

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.212	SD (KM)	0.0537
Variance (KM)	0.00289	SE of Mean (KM)	0.0346
k hat (KM)	15.58	k star (KM)	15.42
nu hat (KM)	8819	nu star (KM)	8727
theta hat (KM)	0.0136	theta star (KM)	0.0138
80% gamma percentile (KM)	0.256	90% gamma percentile (KM)	0.284
95% gamma percentile (KM)	0.308	99% gamma percentile (KM)	0.357

Gamma Kaplan-Meier (KM) Statistics

		Adjusted Level of Significance (β)	0.0492
Approximate Chi Square Value (N/A, α)	8511	Adjusted Chi Square Value (N/A, β)	8509
95% Gamma Approximate KM-UCL (use when n>=50)	0.217	95% Gamma Adjusted KM-UCL (use when n<50)	0.217

Lognormal GOF Test on Detected Observations Only
Not Enough Data to Perform GOF Test

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.178	Mean in Log Scale	-1.809
SD in Original Scale	0.0784	SD in Log Scale	0.406
95% t UCL (assumes normality of ROS data)	0.186	95% Percentile Bootstrap UCL	0.186
95% BCA Bootstrap UCL	0.186	95% Bootstrap t UCL	0.186
95% H-UCL (Log ROS)	0.186		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distributior

APPENDIX B-1D1
VOCs and TPH in Soil - All Areas except for Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH mg/kg

KM Mean (logged)	-1.575	KM Geo Mean	0.207
KM SD (logged)	0.207	95% Critical H Value (KM-Log)	1.685
KM Standard Error of Mean (logged)	0.156	95% H-UCL (KM -Log)	0.216
KM SD (logged)	0.207	95% Critical H Value (KM-Log)	1.685
KM Standard Error of Mean (logged)	0.156		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	2.353	Mean in Log Scale	-1.366
SD in Original Scale	12.79	SD in Log Scale	1.095
95% t UCL (Assumes normality)	3.608	95% H-Stat UCL	0.537

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Data do not follow a Discernible Distribution at 5% Significance Leve

Suggested UCL to Use
95% KM (Chebyshev) UCL 0.363

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
Recommendations are based upon data size, data distribution, and skewness
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statisticiar

APPENDIX B-1D1
VOCs and TPH in Soil - All Areas except for Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH mg/kg

Ethylbenzene

General Statistics

Total Number of Observations	283	Number of Distinct Observations	57
Number of Detects	6	Number of Non-Detects	277
Number of Distinct Detects	6	Number of Distinct Non-Detects	53
Minimum Detect	2.1	Minimum Non-Detect	0.18
Maximum Detect	280	Maximum Non-Detect	270
Variance Detects	12306	Percent Non-Detects	97.88%
Mean Detects	147.2	SD Detects	110.9
Median Detects	143	CV Detects	0.754
Skewness Detects	-0.088	Kurtosis Detects	-2.104
Mean of Logged Detects	4.309	SD of Logged Detects	1.84

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.911	Shapiro Wilk GOF Test
5% Shapiro Wilk Critical Value	0.788	Detected Data appear Normal at 5% Significance Leve
Lilliefors Test Statistic	0.239	Lilliefors GOF Test
5% Lilliefors Critical Value	0.325	Detected Data appear Normal at 5% Significance Leve
Detected Data appear Normal at 5% Significance Leve		

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	3.311	KM Standard Error of Mean	1.685
KM SD	25.84	95% KM (BCA) UCL	6.263
95% KM (t) UCL	6.092	95% KM (Percentile Bootstrap) UCL	5.924
95% KM (z) UCL	6.083	95% KM Bootstrap t UCL	6.026
90% KM Chebyshev UCL	8.366	95% KM Chebyshev UCL	10.66
97.5% KM Chebyshev UCL	13.83	99% KM Chebyshev UCL	20.08

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.555	Anderson-Darling GOF Test
5% A-D Critical Value	0.718	Detected data appear Gamma Distributed at 5% Significance Leve
K-S Test Statistic	0.26	Kolmogorov-Smirnov GOF
5% K-S Critical Value	0.342	Detected data appear Gamma Distributed at 5% Significance Leve
Detected data appear Gamma Distributed at 5% Significance Leve		

Gamma Statistics on Detected Data Only

k hat (MLE)	0.861	k star (bias corrected MLE)	0.542
Theta hat (MLE)	171	Theta star (bias corrected MLE)	271.8
nu hat (MLE)	10.33	nu star (bias corrected)	6.499
Mean (detects)	147.2		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	3.13
Maximum	280	Median	0.01
SD	25.87	CV	8.264
k hat (MLE)	0.14	k star (bias corrected MLE)	0.141
Theta hat (MLE)	22.4	Theta star (bias corrected MLE)	22.26
nu hat (MLE)	79.08	nu star (bias corrected)	79.58
Adjusted Level of Significance (β)	0.0492		
Approximate Chi Square Value (79.58, α)	60.02	Adjusted Chi Square Value (79.58, β)	59.94
95% Gamma Approximate UCL (use when n>=50)	4.15	95% Gamma Adjusted UCL (use when n<50)	4.156

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	3.311	SD (KM)	25.84
Variance (KM)	667.7	SE of Mean (KM)	1.685
k hat (KM)	0.0164	k star (KM)	0.0186
nu hat (KM)	9.294	nu star (KM)	10.53

APPENDIX B-1D1
VOCs and TPH in Soil - All Areas except for Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH mg/kg

theta hat (KM)	201.7	theta star (KM)	178
80% gamma percentile (KM)	6.26E-04	90% gamma percentile (KM)	0.353
95% gamma percentile (KM)	6.678	99% gamma percentile (KM)	93.19
Gamma Kaplan-Meier (KM) Statistics			
Approximate Chi Square Value (10.53, α)	4.275	Adjusted Chi Square Value (10.53, β)	4.255
95% Gamma Approximate KM-UCL (use when n>=50)	8.155	95% Gamma Adjusted KM-UCL (use when n<50)	8.194
Lognormal GOF Test on Detected Observations Only			
Shapiro Wilk Test Statistic	0.749	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.788	Detected Data Not Lognormal at 5% Significance Leve	
Lilliefors Test Statistic	0.335	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.325	Detected Data Not Lognormal at 5% Significance Leve	
Detected Data Not Lognormal at 5% Significance Leve			
Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	3.205	Mean in Log Scale	-5.593
SD in Original Scale	25.86	SD in Log Scale	3.386
95% t UCL (assumes normality of ROS data)	5.742	95% Percentile Bootstrap UCL	5.918
95% BCA Bootstrap UCL	7.302	95% Bootstrap t UCL	8.151
95% H-UCL (Log ROS)	3.017		
Statistics using KM estimates on Logged Data and Assuming Lognormal Distributior			
KM Mean (logged)	-1.586	KM Geo Mean	0.205
KM SD (logged)	0.905	95% Critical H Value (KM-Log)	2.058
KM Standard Error of Mean (logged)	0.0591	95% H-UCL (KM -Log)	0.344
KM SD (logged)	0.905	95% Critical H Value (KM-Log)	2.058
KM Standard Error of Mean (logged)	0.0591		
DL/2 Statistics			
DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	4.976	Mean in Log Scale	-1.335
SD in Original Scale	28.43	SD in Log Scale	1.248
95% t UCL (Assumes normality)	7.764	95% H-Stat UCL	0.682
DL/2 is not a recommended method, provided for comparisons and historical reasons			
Nonparametric Distribution Free UCL Statistics			
Detected Data appear Normal Distributed at 5% Significance Leve			
Suggested UCL to Use			
95% KM (t) UCL	6.092		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
Recommendations are based upon data size, data distribution, and skewness
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statisticiar

APPENDIX B-1D1
VOCs and TPH in Soil - All Areas except for Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH mg/kg

Isopropylbenzene

General Statistics

Total Number of Observations	283	Number of Distinct Observations	59
Number of Detects	6	Number of Non-Detects	277
Number of Distinct Detects	6	Number of Distinct Non-Detects	53
Minimum Detect	3.4	Minimum Non-Detect	0.18
Maximum Detect	2300	Maximum Non-Detect	270
Variance Detects	851868	Percent Non-Detects	97.88%
Mean Detects	574.7	SD Detects	923
Median Detects	63	CV Detects	1.606
Skewness Detects	1.754	Kurtosis Detects	2.629
Mean of Logged Detects	4.67	SD of Logged Detects	2.338

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.707	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.788	Detected Data Not Normal at 5% Significance Leve	
Lilliefors Test Statistic	0.377	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.325	Detected Data Not Normal at 5% Significance Leve	
Detected Data Not Normal at 5% Significance Leve			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	12.37	KM Standard Error of Mean	9.637
KM SD	148	95% KM (BCA) UCL	30.59
95% KM (t) UCL	28.28	95% KM (Percentile Bootstrap) UCL	27.99
95% KM (z) UCL	28.22	95% KM Bootstrap t UCL	235.4
90% KM Chebyshev UCL	41.28	95% KM Chebyshev UCL	54.38
97.5% KM Chebyshev UCL	72.56	99% KM Chebyshev UCL	108.3

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.48	Anderson-Darling GOF Test	
5% A-D Critical Value	0.752	Detected data appear Gamma Distributed at 5% Significance Leve	
K-S Test Statistic	0.341	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.353	Detected data appear Gamma Distributed at 5% Significance Leve	
Detected data appear Gamma Distributed at 5% Significance Leve			

Gamma Statistics on Detected Data Only

k hat (MLE)	0.392	k star (bias corrected MLE)	0.307
Theta hat (MLE)	1466	Theta star (bias corrected MLE)	1871
nu hat (MLE)	4.704	nu star (bias corrected)	3.686
Mean (detects)	574.7		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	12.19
Maximum	2300	Median	0.01
SD	148.3	CV	12.16
k hat (MLE)	0.115	k star (bias corrected MLE)	0.117
Theta hat (MLE)	105.7	Theta star (bias corrected MLE)	104.7
nu hat (MLE)	65.3	nu star (bias corrected)	65.95
Adjusted Level of Significance (β)	0.0492		
Approximate Chi Square Value (65.95, α)	48.26	Adjusted Chi Square Value (65.95, β)	48.18
95% Gamma Approximate UCL (use when n>=50)	16.66	95% Gamma Adjusted UCL (use when n<50)	16.69

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	12.37	SD (KM)	148
Variance (KM)	21902	SE of Mean (KM)	9.637
k hat (KM)	0.00699	k star (KM)	0.00927
nu hat (KM)	3.956	nu star (KM)	5.248

APPENDIX B-1D1
VOCs and TPH in Soil - All Areas except for Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH mg/kg

theta hat (KM)	1770	theta star (KM)	1335
80% gamma percentile (KM)	2.66E-08	90% gamma percentile (KM)	0.00876
95% gamma percentile (KM)	2.994	99% gamma percentile (KM)	319.4
Gamma Kaplan-Meier (KM) Statistics			
Approximate Chi Square Value (5.25, α)	1.268	Adjusted Chi Square Value (5.25, β)	1.259
95% Gamma Approximate KM-UCL (use when n>=50)	51.19	95% Gamma Adjusted KM-UCL (use when n<50)	51.59
Lognormal GOF Test on Detected Observations Only			
Shapiro Wilk Test Statistic	0.926	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.788	Detected Data appear Lognormal at 5% Significance Leve	
Lilliefors Test Statistic	0.253	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.325	Detected Data appear Lognormal at 5% Significance Leve	
Detected Data appear Lognormal at 5% Significance Leve			
Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	12.19	Mean in Log Scale	-13.61
SD in Original Scale	148.3	SD in Log Scale	6.263
95% t UCL (assumes normality of ROS data)	26.73	95% Percentile Bootstrap UCL	28.28
95% BCA Bootstrap UCL	41.05	95% Bootstrap t UCL	335.6
95% H-UCL (Log ROS)	9433		
Statistics using KM estimates on Logged Data and Assuming Lognormal Distributior			
KM Mean (logged)	-1.578	KM Geo Mean	0.206
KM SD (logged)	0.974	95% Critical H Value (KM-Log)	2.114
KM Standard Error of Mean (logged)	0.0637	95% H-UCL (KM -Log)	0.375
KM SD (logged)	0.974	95% Critical H Value (KM-Log)	2.114
KM Standard Error of Mean (logged)	0.0637		
DL/2 Statistics			
DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	13.91	Mean in Log Scale	-1.33
SD in Original Scale	148.6	SD in Log Scale	1.288
95% t UCL (Assumes normality)	28.49	95% H-Stat UCL	0.729
DL/2 is not a recommended method, provided for comparisons and historical reasons			
Nonparametric Distribution Free UCL Statistics			
Detected Data appear Gamma Distributed at 5% Significance Leve			
Suggested UCL to Use			
95% KM Approximate Gamma UCL	51.19		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
Recommendations are based upon data size, data distribution, and skewness
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statisticiar

APPENDIX B-1D1
VOCs and TPH in Soil - All Areas except for Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH mg/kg

Methyltertbutyl ether (MTBE)

General Statistics

Total Number of Observations	283	Number of Distinct Observations	65
Number of Detects	3	Number of Non-Detects	280
Number of Distinct Detects	3	Number of Distinct Non-Detects	64
Minimum Detect	0.82	Minimum Non-Detect	0.36
Maximum Detect	2.4	Maximum Non-Detect	540
Variance Detects	0.68	Percent Non-Detects	98.94%
Mean Detects	1.473	SD Detects	0.825
Median Detects	1.2	CV Detects	0.56
Skewness Detects	1.328	Kurtosis Detects	N/A
Mean of Logged Detects	0.286	SD of Logged Detects	0.544

Warning: Data set has only 3 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.918	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Normal at 5% Significance Leve	
Lilliefors Test Statistic	0.297	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.425	Detected Data appear Normal at 5% Significance Leve	

Detected Data appear Normal at 5% Significance Leve

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.374	KM Standard Error of Mean	0.0106
KM SD	0.139	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.391	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.391	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.405	95% KM Chebyshev UCL	0.42
97.5% KM Chebyshev UCL	0.44	99% KM Chebyshev UCL	0.479

Gamma GOF Tests on Detected Observations Only
Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	5.107	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.288	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	30.64	nu star (bias corrected)	N/A
Mean (detects)	1.473		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.0255
Maximum	2.4	Median	0.01
SD	0.165	CV	6.484
k hat (MLE)	0.685	k star (bias corrected MLE)	0.68
Theta hat (MLE)	0.0372	Theta star (bias corrected MLE)	0.0375
nu hat (MLE)	387.8	nu star (bias corrected)	385
Adjusted Level of Significance (β)	0.0492		
Approximate Chi Square Value (385.01, α)	340.5	Adjusted Chi Square Value (385.01, β)	340.3
95% Gamma Approximate UCL (use when n>=50)	0.0288	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.374	SD (KM)	0.139
Variance (KM)	0.0192	SE of Mean (KM)	0.0106
k hat (KM)	7.27	k star (KM)	7.195
nu hat (KM)	4115	nu star (KM)	4072

APPENDIX B-1D1
VOCs and TPH in Soil - All Areas except for Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH mg/kg

theta hat (KM)	0.0514	theta star (KM)	0.0519
80% gamma percentile (KM)	0.483	90% gamma percentile (KM)	0.56
95% gamma percentile (KM)	0.628	99% gamma percentile (KM)	0.771

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (N/A, α)	3925	Adjusted Chi Square Value (N/A, β)	3924
95% Gamma Approximate KM-UCL (use when n>=50)	0.388	95% Gamma Adjusted KM-UCL (use when n<50)	0.388

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.973	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Lognormal at 5% Significance Leve	
Lilliefors Test Statistic	0.242	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.425	Detected Data appear Lognormal at 5% Significance Leve	
Detected Data appear Lognormal at 5% Significance Leve			

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.0401	Mean in Log Scale	-4.327
SD in Original Scale	0.167	SD in Log Scale	1.307
95% t UCL (assumes normality of ROS data)	0.0564	95% Percentile Bootstrap UCL	0.0588
95% BCA Bootstrap UCL	0.068	95% Bootstrap t UCL	0.107
95% H-UCL (Log ROS)	0.0374		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distributior

KM Mean (logged)	-1.005	KM Geo Mean	0.366
KM SD (logged)	0.151	95% Critical H Value (KM-Log)	1.672
KM Standard Error of Mean (logged)	0.012	95% H-UCL (KM -Log)	0.376
KM SD (logged)	0.151	95% Critical H Value (KM-Log)	1.672
KM Standard Error of Mean (logged)	0.012		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	4.706	Mean in Log Scale	-0.666
SD in Original Scale	25.46	SD in Log Scale	1.099
95% t UCL (Assumes normality)	7.204	95% H-Stat UCL	1.086

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Detected Data appear Normal Distributed at 5% Significance Leve

Suggested UCL to Use
95% KM (t) UCL 0.391

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
Recommendations are based upon data size, data distribution, and skewness
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statisticiar

APPENDIX B-1D1
VOCs and TPH in Soil - All Areas except for Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH mg/kg

Naphthalene

General Statistics

Total Number of Observations	283	Number of Distinct Observations	67
Number of Detects	10	Number of Non-Detects	273
Number of Distinct Detects	10	Number of Distinct Non-Detects	58
Minimum Detect	0.87	Minimum Non-Detect	0.36
Maximum Detect	2900	Maximum Non-Detect	540
Variance Detects	866030	Percent Non-Detects	96.47%
Mean Detects	605.3	SD Detects	930.6
Median Detects	172	CV Detects	1.537
Skewness Detects	1.988	Kurtosis Detects	4.025
Mean of Logged Detects	4.117	SD of Logged Detects	3.087

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.725	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.842	Detected Data Not Normal at 5% Significance Leve	
Lilliefors Test Statistic	0.258	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.262	Detected Data appear Normal at 5% Significance Leve	
Detected Data appear Approximate Normal at 5% Significance Leve			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	21.75	KM Standard Error of Mean	12.54
KM SD	200	95% KM (BCA) UCL	45.19
95% KM (t) UCL	42.44	95% KM (Percentile Bootstrap) UCL	43.19
95% KM (z) UCL	42.37	95% KM Bootstrap t UCL	80.16
90% KM Chebyshev UCL	59.36	95% KM Chebyshev UCL	76.39
97.5% KM Chebyshev UCL	100	99% KM Chebyshev UCL	146.5

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.424	Anderson-Darling GOF Test	
5% A-D Critical Value	0.813	Detected data appear Gamma Distributed at 5% Significance Leve	
K-S Test Statistic	0.238	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.288	Detected data appear Gamma Distributed at 5% Significance Leve	
Detected data appear Gamma Distributed at 5% Significance Leve			

Gamma Statistics on Detected Data Only

k hat (MLE)	0.301	k star (bias corrected MLE)	0.277
Theta hat (MLE)	2010	Theta star (bias corrected MLE)	2182
nu hat (MLE)	6.022	nu star (bias corrected)	5.549
Mean (detects)	605.3		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	21.4
Maximum	2900	Median	0.01
SD	200.4	CV	9.366
k hat (MLE)	0.109	k star (bias corrected MLE)	0.11
Theta hat (MLE)	196.1	Theta star (bias corrected MLE)	194
nu hat (MLE)	61.76	nu star (bias corrected)	62.44
Adjusted Level of Significance (β)	0.0492		
Approximate Chi Square Value (62.44, α)	45.26	Adjusted Chi Square Value (62.44, β)	45.19
95% Gamma Approximate UCL (use when n>=50)	29.52	95% Gamma Adjusted UCL (use when n<50)	29.57

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	21.75	SD (KM)	200
Variance (KM)	40019	SE of Mean (KM)	12.54
k hat (KM)	0.0118	k star (KM)	0.0141
nu hat (KM)	6.692	nu star (KM)	7.955

APPENDIX B-1D1
VOCs and TPH in Soil - All Areas except for Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH mg/kg

theta hat (KM)	1840	theta star (KM)	1548
80% gamma percentile (KM)	1.12E-04	90% gamma percentile (KM)	0.488
95% gamma percentile (KM)	23.19	99% gamma percentile (KM)	614

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (7.95, α)	2.709	Adjusted Chi Square Value (7.95, β)	2.693
95% Gamma Approximate KM-UCL (use when n>=50)	63.88	95% Gamma Adjusted KM-UCL (use when n<50)	64.25

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.878	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.842	Detected Data appear Lognormal at 5% Significance Leve	
Lilliefors Test Statistic	0.228	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.262	Detected Data appear Lognormal at 5% Significance Leve	
Detected Data appear Lognormal at 5% Significance Leve			

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	21.39	Mean in Log Scale	-15.83
SD in Original Scale	200.4	SD in Log Scale	7.17
95% t UCL (assumes normality of ROS data)	41.05	95% Percentile Bootstrap UCL	43.39
95% BCA Bootstrap UCL	53.04	95% Bootstrap t UCL	86.48
95% H-UCL (Log ROS)	1190076		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distributior

KM Mean (logged)	-0.838	KM Geo Mean	0.433
KM SD (logged)	1.099	95% Critical H Value (KM-Log)	2.218
KM Standard Error of Mean (logged)	0.069	95% H-UCL (KM -Log)	0.915
KM SD (logged)	1.099	95% Critical H Value (KM-Log)	2.218
KM Standard Error of Mean (logged)	0.069		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	24.52	Mean in Log Scale	-0.611
SD in Original Scale	201.4	SD in Log Scale	1.345
95% t UCL (Assumes normality)	44.27	95% H-Stat UCL	1.629

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Detected Data appear Approximate Normal Distributed at 5% Significance Leve

Suggested UCL to Use

95% KM (t) UCL	42.44

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF tes
When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCI

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
Recommendations are based upon data size, data distribution, and skewness
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician

APPENDIX B-1D1
VOCs and TPH in Soil - All Areas except for Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH mg/kg

nButylbenzene

General Statistics

Total Number of Observations	283	Number of Distinct Observations	65
Number of Detects	4	Number of Non-Detects	279
Number of Distinct Detects	4	Number of Distinct Non-Detects	61
Minimum Detect	2.4	Minimum Non-Detect	0.36
Maximum Detect	1700	Maximum Non-Detect	540
Variance Detects	597089	Percent Non-Detects	98.59%
Mean Detects	628.1	SD Detects	772.7
Median Detects	405	CV Detects	1.23
Skewness Detects	1.247	Kurtosis Detects	0.852
Mean of Logged Detects	4.926	SD of Logged Detects	2.902

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.885	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Normal at 5% Significance Leve	
Lilliefors Test Statistic	0.24	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.375	Detected Data appear Normal at 5% Significance Leve	
Detected Data appear Normal at 5% Significance Leve			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	9.241	KM Standard Error of Mean	7.463
KM SD	108.7	95% KM (BCA) UCL	N/A
95% KM (t) UCL	21.56	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	21.52	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	31.63	95% KM Chebyshev UCL	41.77
97.5% KM Chebyshev UCL	55.85	99% KM Chebyshev UCL	83.5

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.229	Anderson-Darling GOF Test	
5% A-D Critical Value	0.689	Detected data appear Gamma Distributed at 5% Significance Leve	
K-S Test Statistic	0.213	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.413	Detected data appear Gamma Distributed at 5% Significance Leve	
Detected data appear Gamma Distributed at 5% Significance Leve			

Gamma Statistics on Detected Data Only

k hat (MLE)	0.429	k star (bias corrected MLE)	0.274
Theta hat (MLE)	1464	Theta star (bias corrected MLE)	2293
nu hat (MLE)	3.432	nu star (bias corrected)	2.191
Mean (detects)	628.1		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	8.888
Maximum	1700	Median	0.01
SD	108.9	CV	12.26
k hat (MLE)	0.119	k star (bias corrected MLE)	0.12
Theta hat (MLE)	74.52	Theta star (bias corrected MLE)	73.85
nu hat (MLE)	67.5	nu star (bias corrected)	68.12
Adjusted Level of Significance (β)	0.0492		
Approximate Chi Square Value (68.12, α)	50.12	Adjusted Chi Square Value (68.12, β)	50.04
95% Gamma Approximate UCL (use when n>=50)	12.08	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	9.241	SD (KM)	108.7
Variance (KM)	11821	SE of Mean (KM)	7.463
k hat (KM)	0.00722	k star (KM)	0.0095
nu hat (KM)	4.089	nu star (KM)	5.379

APPENDIX B-1D1
VOCs and TPH in Soil - All Areas except for Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH mg/kg

theta hat (KM)	1279	theta star (KM)	972.4
80% gamma percentile (KM)	3.49E-08	90% gamma percentile (KM)	0.00843
95% gamma percentile (KM)	2.498	99% gamma percentile (KM)	240.8
Gamma Kaplan-Meier (KM) Statistics			
Approximate Chi Square Value (5.38, α)	1.331	Adjusted Chi Square Value (5.38, β)	1.321
95% Gamma Approximate KM-UCL (use when n>=50)	37.34	95% Gamma Adjusted KM-UCL (use when n<50)	37.63
Lognormal GOF Test on Detected Observations Only			
Shapiro Wilk Test Statistic	0.907	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Lognormal at 5% Significance Leve	
Lilliefors Test Statistic	0.242	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.375	Detected Data appear Lognormal at 5% Significance Leve	
Detected Data appear Lognormal at 5% Significance Leve			
Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	8.878	Mean in Log Scale	-20.55
SD in Original Scale	108.9	SD in Log Scale	7.576
95% t UCL (assumes normality of ROS data)	19.57	95% Percentile Bootstrap UCL	20.44
95% BCA Bootstrap UCL	30.05	95% Bootstrap t UCL	3926
95% H-UCL (Log ROS)	339654		
Statistics using KM estimates on Logged Data and Assuming Lognormal Distributior			
KM Mean (logged)	-0.937	KM Geo Mean	0.392
KM SD (logged)	0.765	95% Critical H Value (KM-Log)	1.956
KM Standard Error of Mean (logged)	0.0526	95% H-UCL (KM -Log)	0.574
KM SD (logged)	0.765	95% Critical H Value (KM-Log)	1.956
KM Standard Error of Mean (logged)	0.0526		
DL/2 Statistics			
DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	12.62	Mean in Log Scale	-0.654
SD in Original Scale	111.1	SD in Log Scale	1.208
95% t UCL (Assumes normality)	23.52	95% H-Stat UCL	1.275
DL/2 is not a recommended method, provided for comparisons and historical reasons			
Nonparametric Distribution Free UCL Statistics			
Detected Data appear Normal Distributed at 5% Significance Leve			
Suggested UCL to Use			
95% KM (t) UCL	21.56		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
Recommendations are based upon data size, data distribution, and skewness
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statisticiar

APPENDIX B-1D1
VOCs and TPH in Soil - All Areas except for Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH mg/kg

nPropylbenzene

General Statistics

Total Number of Observations	283	Number of Distinct Observations	58
Number of Detects	6	Number of Non-Detects	277
Number of Distinct Detects	6	Number of Distinct Non-Detects	52
Minimum Detect	12	Minimum Non-Detect	0.18
Maximum Detect	1600	Maximum Non-Detect	270
Variance Detects	385879	Percent Non-Detects	97.88%
Mean Detects	355.7	SD Detects	621.2
Median Detects	73.5	CV Detects	1.747
Skewness Detects	2.262	Kurtosis Detects	5.197
Mean of Logged Detects	4.631	SD of Logged Detects	1.739

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.638	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.788	Detected Data Not Normal at 5% Significance Leve	
Lilliefors Test Statistic	0.343	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.325	Detected Data Not Normal at 5% Significance Leve	
Detected Data Not Normal at 5% Significance Leve			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	7.728	KM Standard Error of Mean	6.327
KM SD	97.16	95% KM (BCA) UCL	18.55
95% KM (t) UCL	18.17	95% KM (Percentile Bootstrap) UCL	18.96
95% KM (z) UCL	18.14	95% KM Bootstrap t UCL	87.81
90% KM Chebyshev UCL	26.71	95% KM Chebyshev UCL	35.31
97.5% KM Chebyshev UCL	47.24	99% KM Chebyshev UCL	70.68

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.453	Anderson-Darling GOF Test	
5% A-D Critical Value	0.735	Detected data appear Gamma Distributed at 5% Significance Leve	
K-S Test Statistic	0.284	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.348	Detected data appear Gamma Distributed at 5% Significance Leve	
Detected data appear Gamma Distributed at 5% Significance Leve			

Gamma Statistics on Detected Data Only

k hat (MLE)	0.509	k star (bias corrected MLE)	0.366
Theta hat (MLE)	698.3	Theta star (bias corrected MLE)	972.3
nu hat (MLE)	6.112	nu star (bias corrected)	4.389
Mean (detects)	355.7		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	7.55
Maximum	1600	Median	0.01
SD	97.35	CV	12.89
k hat (MLE)	0.123	k star (bias corrected MLE)	0.124
Theta hat (MLE)	61.43	Theta star (bias corrected MLE)	60.91
nu hat (MLE)	69.57	nu star (bias corrected)	70.16
Adjusted Level of Significance (β)	0.0492		
Approximate Chi Square Value (70.16, α)	51.88	Adjusted Chi Square Value (70.16, β)	51.8
95% Gamma Approximate UCL (use when n>=50)	10.21	95% Gamma Adjusted UCL (use when n<50)	10.23

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	7.728	SD (KM)	97.16
Variance (KM)	9441	SE of Mean (KM)	6.327
k hat (KM)	0.00633	k star (KM)	0.00861
nu hat (KM)	3.581	nu star (KM)	4.876

APPENDIX B-1D1
VOCs and TPH in Soil - All Areas except for Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH mg/kg

theta hat (KM)	1222	theta star (KM)	897.1
80% gamma percentile (KM)	2.86E-09	90% gamma percentile (KM)	0.00248
95% gamma percentile (KM)	1.318	99% gamma percentile (KM)	193.5
Gamma Kaplan-Meier (KM) Statistics			
Approximate Chi Square Value (4.88, α)	1.095	Adjusted Chi Square Value (4.88, β)	1.086
95% Gamma Approximate KM-UCL (use when n>=50)	34.4	95% Gamma Adjusted KM-UCL (use when n<50)	34.68
Lognormal GOF Test on Detected Observations Only			
Shapiro Wilk Test Statistic	0.968	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.788	Detected Data appear Lognormal at 5% Significance Leve	
Lilliefors Test Statistic	0.194	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.325	Detected Data appear Lognormal at 5% Significance Leve	
Detected Data appear Lognormal at 5% Significance Leve			
Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	7.558	Mean in Log Scale	-9.342
SD in Original Scale	97.34	SD in Log Scale	4.787
95% t UCL (assumes normality of ROS data)	17.11	95% Percentile Bootstrap UCL	18.92
95% BCA Bootstrap UCL	28.48	95% Bootstrap t UCL	123.9
95% H-UCL (Log ROS)	53.73		
Statistics using KM estimates on Logged Data and Assuming Lognormal Distributior			
KM Mean (logged)	-1.579	KM Geo Mean	0.206
KM SD (logged)	0.947	95% Critical H Value (KM-Log)	2.091
KM Standard Error of Mean (logged)	0.0619	95% H-UCL (KM -Log)	0.363
KM SD (logged)	0.947	95% Critical H Value (KM-Log)	2.091
KM Standard Error of Mean (logged)	0.0619		
DL/2 Statistics			
DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	9.272	Mean in Log Scale	-1.33
SD in Original Scale	97.9	SD in Log Scale	1.268
95% t UCL (Assumes normality)	18.88	95% H-Stat UCL	0.707
DL/2 is not a recommended method, provided for comparisons and historical reasons			
Nonparametric Distribution Free UCL Statistics			
Detected Data appear Gamma Distributed at 5% Significance Leve			
Suggested UCL to Use			
95% KM Approximate Gamma UCL	34.4		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
Recommendations are based upon data size, data distribution, and skewness
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statisticiar

APPENDIX B-1D1
VOCs and TPH in Soil - All Areas except for Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH mg/kg

secButylbenzene

General Statistics

Total Number of Observations	283	Number of Distinct Observations	63
Number of Detects	3	Number of Non-Detects	280
Number of Distinct Detects	3	Number of Distinct Non-Detects	60
Minimum Detect	67	Minimum Non-Detect	0.36
Maximum Detect	1600	Maximum Non-Detect	270
Variance Detects	598746	Percent Non-Detects	98.94%
Mean Detects	772.3	SD Detects	773.8
Median Detects	650	CV Detects	1.002
Skewness Detects	0.694	Kurtosis Detects	N/A
Mean of Logged Detects	6.02	SD of Logged Detects	1.635

Warning: Data set has only 3 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.981	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Normal at 5% Significance Leve	
Lilliefors Test Statistic	0.229	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.425	Detected Data appear Normal at 5% Significance Leve	

Detected Data appear Normal at 5% Significance Leve

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	8.548	KM Standard Error of Mean	7.454
KM SD	102.4	95% KM (BCA) UCL	N/A
95% KM (t) UCL	20.85	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	20.81	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	30.91	95% KM Chebyshev UCL	41.04
97.5% KM Chebyshev UCL	55.1	99% KM Chebyshev UCL	82.71

Gamma GOF Tests on Detected Observations Only
Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	0.925	k star (bias corrected MLE)	N/A
Theta hat (MLE)	834.6	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	5.552	nu star (bias corrected)	N/A
Mean (detects)	772.3		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	8.197
Maximum	1600	Median	0.01
SD	102.6	CV	12.52
k hat (MLE)	0.12	k star (bias corrected MLE)	0.121
Theta hat (MLE)	68.2	Theta star (bias corrected MLE)	67.59
nu hat (MLE)	68.03	nu star (bias corrected)	68.64
Adjusted Level of Significance (β)	0.0492		
Approximate Chi Square Value (68.64, α)	50.57	Adjusted Chi Square Value (68.64, β)	50.49
95% Gamma Approximate UCL (use when n>=50)	11.13	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	8.548	SD (KM)	102.4
Variance (KM)	10482	SE of Mean (KM)	7.454
k hat (KM)	0.00697	k star (KM)	0.00925
nu hat (KM)	3.945	nu star (KM)	5.237

APPENDIX B-1D1
VOCs and TPH in Soil - All Areas except for Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH mg/kg

theta hat (KM)	1226	theta star (KM)	923.9
80% gamma percentile (KM)	1.75E-08	90% gamma percentile (KM)	0.00592
95% gamma percentile (KM)	2.049	99% gamma percentile (KM)	220.5

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (5.24, α)	1.263	Adjusted Chi Square Value (5.24, β)	1.253
95% Gamma Approximate KM-UCL (use when n>=50)	35.44	95% Gamma Adjusted KM-UCL (use when n<50)	35.71

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.941	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Lognormal at 5% Significance Leve	
Lilliefors Test Statistic	0.277	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.425	Detected Data appear Lognormal at 5% Significance Leve	
Detected Data appear Lognormal at 5% Significance Leve			

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	8.19	Mean in Log Scale	-12
SD in Original Scale	102.6	SD in Log Scale	5.124
95% t UCL (assumes normality of ROS data)	18.25	95% Percentile Bootstrap UCL	19.26
95% BCA Bootstrap UCL	27.68	95% Bootstrap t UCL	62085
95% H-UCL (Log ROS)	25.94		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distributior

KM Mean (logged)	-0.947	KM Geo Mean	0.388
KM SD (logged)	0.735	95% Critical H Value (KM-Log)	1.937
KM Standard Error of Mean (logged)	0.0536	95% H-UCL (KM -Log)	0.553
KM SD (logged)	0.735	95% Critical H Value (KM-Log)	1.937
KM Standard Error of Mean (logged)	0.0536		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	10.27	Mean in Log Scale	-0.684
SD in Original Scale	103.1	SD in Log Scale	1.102
95% t UCL (Assumes normality)	20.38	95% H-Stat UCL	1.071

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Detected Data appear Normal Distributed at 5% Significance Leve

Suggested UCL to Use
95% KM (t) UCL 20.85

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
Recommendations are based upon data size, data distribution, and skewness
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statisticiar

APPENDIX B-1D1
VOCs and TPH in Soil - All Areas except for Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH mg/kg

tertButylbenzene

General Statistics

Total Number of Observations	283	Number of Distinct Observations	64
Number of Detects	1	Number of Non-Detects	282
Number of Distinct Detects	1	Number of Distinct Non-Detects	63

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set
It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV)

The data set for variable U was not processed!

APPENDIX B-1D1
VOCs and TPH in Soil - All Areas except for Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH mg/kg

Tetrachloroethene (PCE)

General Statistics

Total Number of Observations	283	Number of Distinct Observations	62
Number of Detects	6	Number of Non-Detects	277
Number of Distinct Detects	6	Number of Distinct Non-Detects	57
Minimum Detect	0.64	Minimum Non-Detect	0.18
Maximum Detect	11	Maximum Non-Detect	270
Variance Detects	16.81	Percent Non-Detects	97.88%
Mean Detects	3.935	SD Detects	4.1
Median Detects	2.55	CV Detects	1.042
Skewness Detects	1.189	Kurtosis Detects	0.7
Mean of Logged Detects	0.82	SD of Logged Detects	1.208

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.85	Shapiro Wilk GOF Test
5% Shapiro Wilk Critical Value	0.788	Detected Data appear Normal at 5% Significance Leve
Lilliefors Test Statistic	0.248	Lilliefors GOF Test
5% Lilliefors Critical Value	0.325	Detected Data appear Normal at 5% Significance Leve
Detected Data appear Normal at 5% Significance Leve		

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.263	KM Standard Error of Mean	0.0522
KM SD	0.784	95% KM (BCA) UCL	0.435
95% KM (t) UCL	0.349	95% KM (Percentile Bootstrap) UCL	0.395
95% KM (z) UCL	0.349	95% KM Bootstrap t UCL	0.375
90% KM Chebyshev UCL	0.42	95% KM Chebyshev UCL	0.491
97.5% KM Chebyshev UCL	0.589	99% KM Chebyshev UCL	0.783

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.372	Anderson-Darling GOF Test
5% A-D Critical Value	0.714	Detected data appear Gamma Distributed at 5% Significance Leve
K-S Test Statistic	0.247	Kolmogorov-Smirnov GOF
5% K-S Critical Value	0.341	Detected data appear Gamma Distributed at 5% Significance Leve
Detected data appear Gamma Distributed at 5% Significance Leve		

Gamma Statistics on Detected Data Only

k hat (MLE)	1.044	k star (bias corrected MLE)	0.633
Theta hat (MLE)	3.769	Theta star (bias corrected MLE)	6.215
nu hat (MLE)	12.53	nu star (bias corrected)	7.598
Mean (detects)	3.935		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.0932
Maximum	11	Median	0.01
SD	0.787	CV	8.439
k hat (MLE)	0.322	k star (bias corrected MLE)	0.321
Theta hat (MLE)	0.29	Theta star (bias corrected MLE)	0.29
nu hat (MLE)	182.2	nu star (bias corrected)	181.6
Adjusted Level of Significance (β)	0.0492		
Approximate Chi Square Value (181.62, α)	151.5	Adjusted Chi Square Value (181.62, β)	151.3
95% Gamma Approximate UCL (use when n>=50)	0.112	95% Gamma Adjusted UCL (use when n<50)	0.112

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.263	SD (KM)	0.784
Variance (KM)	0.615	SE of Mean (KM)	0.0522
k hat (KM)	0.113	k star (KM)	0.114
nu hat (KM)	63.73	nu star (KM)	64.39

APPENDIX B-1D1
VOCs and TPH in Soil - All Areas except for Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH mg/kg

theta hat (KM)	2.338	theta star (KM)	2.314
80% gamma percentile (KM)	0.217	90% gamma percentile (KM)	0.734
95% gamma percentile (KM)	1.512	99% gamma percentile (KM)	3.917

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (64.39, α)	46.93	Adjusted Chi Square Value (64.39, β)	46.85
95% Gamma Approximate KM-UCL (use when n>=50)	0.361	95% Gamma Adjusted KM-UCL (use when n<50)	0.362

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.896	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.788	Detected Data appear Lognormal at 5% Significance Leve	
Lilliefors Test Statistic	0.201	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.325	Detected Data appear Lognormal at 5% Significance Leve	
Detected Data appear Lognormal at 5% Significance Leve			

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.0854	Mean in Log Scale	-9.639
SD in Original Scale	0.788	SD in Log Scale	3.573
95% t UCL (assumes normality of ROS data)	0.163	95% Percentile Bootstrap UCL	0.167
95% BCA Bootstrap UCL	0.214	95% Bootstrap t UCL	0.416
95% H-UCL (Log ROS)	0.112		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distributior

KM Mean (logged)	-1.658	KM Geo Mean	0.19
KM SD (logged)	0.408	95% Critical H Value (KM-Log)	1.754
KM Standard Error of Mean (logged)	0.0272	95% H-UCL (KM -Log)	0.216
KM SD (logged)	0.408	95% Critical H Value (KM-Log)	1.754
KM Standard Error of Mean (logged)	0.0272		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	2.43	Mean in Log Scale	-1.323
SD in Original Scale	12.8	SD in Log Scale	1.15
95% t UCL (Assumes normality)	3.685	95% H-Stat UCL	0.602

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Detected Data appear Normal Distributed at 5% Significance Leve

Suggested UCL to Use

95% KM (t) UCL	0.349

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
Recommendations are based upon data size, data distribution, and skewness
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statisticiar

APPENDIX B-1D1
VOCs and TPH in Soil - All Areas except for Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH mg/kg

Toluene

General Statistics			
Total Number of Observations	283	Number of Distinct Observations	62
Number of Detects	25	Number of Non-Detects	258
Number of Distinct Detects	21	Number of Distinct Non-Detects	53
Minimum Detect	0.33	Minimum Non-Detect	0.18
Maximum Detect	4200	Maximum Non-Detect	270
Variance Detects	785186	Percent Non-Detects	91.17%
Mean Detects	232.9	SD Detects	886.1
Median Detects	0.71	CV Detects	3.805
Skewness Detects	4.212	Kurtosis Detects	18.4
Mean of Logged Detects	0.426	SD of Logged Detects	2.306

Normal GOF Test on Detects Only			
Shapiro Wilk Test Statistic	0.296	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.918	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.523	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.173	Detected Data Not Normal at 5% Significance Level	
Detected Data Not Normal at 5% Significance Level			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
KM Mean	20.74	KM Standard Error of Mean	16.16
KM SD	266.4	95% KM (BCA) UCL	52.54
95% KM (t) UCL	47.41	95% KM (Percentile Bootstrap) UCL	50.44
95% KM (z) UCL	47.32	95% KM Bootstrap t UCL	21572
90% KM Chebyshev UCL	69.22	95% KM Chebyshev UCL	91.18
97.5% KM Chebyshev UCL	121.7	99% KM Chebyshev UCL	181.5

Gamma GOF Tests on Detected Observations Only			
A-D Test Statistic	7.401	Anderson-Darling GOF Test	
5% A-D Critical Value	0.943	Detected Data Not Gamma Distributed at 5% Significance Leve	
K-S Test Statistic	0.53	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.197	Detected Data Not Gamma Distributed at 5% Significance Leve	
Detected Data Not Gamma Distributed at 5% Significance Leve			

Gamma Statistics on Detected Data Only			
k hat (MLE)	0.153	k star (bias corrected MLE)	0.161
Theta hat (MLE)	1526	Theta star (bias corrected MLE)	1447
nu hat (MLE)	7.629	nu star (bias corrected)	8.047
Mean (detects)	232.9		

Gamma ROS Statistics using Imputed Non-Detects			
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs			
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20			
For such situations, GROS method may yield incorrect values of UCLs and BTVs			
This is especially true when the sample size is small.			
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates			
Minimum	0.01	Mean	20.58
Maximum	4200	Median	0.01
SD	266.8	CV	12.97
k hat (MLE)	0.111	k star (bias corrected MLE)	0.113
Theta hat (MLE)	184.6	Theta star (bias corrected MLE)	182.7
nu hat (MLE)	63.09	nu star (bias corrected)	63.75
Adjusted Level of Significance (β)	0.0492		
Approximate Chi Square Value (63.75, α)	46.38	Adjusted Chi Square Value (63.75, β)	46.31
95% Gamma Approximate UCL (use when n>=50)	28.29	95% Gamma Adjusted UCL (use when n<50)	28.33

APPENDIX B-1D1
VOCs and TPH in Soil - All Areas except for Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH mg/kg

Estimates of Gamma Parameters using KM Estimates			
Mean (KM)	20.74	SD (KM)	266.4
Variance (KM)	70948	SE of Mean (KM)	16.16
k hat (KM)	0.00606	k star (KM)	0.00836
nu hat (KM)	3.433	nu star (KM)	4.73
theta hat (KM)	3420	theta star (KM)	2482
80% gamma percentile (KM)	3.55E-09	90% gamma percentile (KM)	0.00469
95% gamma percentile (KM)	3.033	99% gamma percentile (KM)	512.1
Gamma Kaplan-Meier (KM) Statistics			
Approximate Chi Square Value (4.73, α)	1.029	Adjusted Chi Square Value (4.73, β)	1.021
95% Gamma Approximate KM-UCL (use when n>=50)	95.31	95% Gamma Adjusted KM-UCL (use when n<50)	96.1
Lognormal GOF Test on Detected Observations Only			
Shapiro Wilk Test Statistic	0.534	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.918	Detected Data Not Lognormal at 5% Significance Leve	
Lilliefors Test Statistic	0.374	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.173	Detected Data Not Lognormal at 5% Significance Leve	
Detected Data Not Lognormal at 5% Significance Leve			
Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	20.57	Mean in Log Scale	-8.088
SD in Original Scale	266.8	SD in Log Scale	4.113
95% t UCL (assumes normality of ROS data)	46.75	95% Percentile Bootstrap UCL	50.24
95% BCA Bootstrap UCL	74.28	95% Bootstrap t UCL	20083
95% H-UCL (Log ROS)	5.835		
Statistics using KM estimates on Logged Data and Assuming Lognormal Distributior			
KM Mean (logged)	-1.497	KM Geo Mean	0.224
KM SD (logged)	0.913	95% Critical H Value (KM-Log)	2.064
KM Standard Error of Mean (logged)	0.0583	95% H-UCL (KM -Log)	0.38
KM SD (logged)	0.913	95% Critical H Value (KM-Log)	2.064
KM Standard Error of Mean (logged)	0.0583		
DL/2 Statistics			
DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	22.66	Mean in Log Scale	-1.235
SD in Original Scale	267	SD in Log Scale	1.319
95% t UCL (Assumes normality)	48.85	95% H-Stat UCL	0.84
DL/2 is not a recommended method, provided for comparisons and historical reasons			
Nonparametric Distribution Free UCL Statistics			
Data do not follow a Discernible Distribution at 5% Significance Leve			
Suggested UCL to Use			
95% KM (Chebyshev) UCL	91.18		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
Recommendations are based upon data size, data distribution, and skewness
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statisticiar

APPENDIX B-1D1
VOCs and TPH in Soil - All Areas except for Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH mg/kg

TPHGasoline (C4C12)

General Statistics

Total Number of Observations	284	Number of Distinct Observations	37
Number of Detects	32	Number of Non-Detects	252
Number of Distinct Detects	30	Number of Distinct Non-Detects	10
Minimum Detect	0.06	Minimum Non-Detect	0.04
Maximum Detect	1300	Maximum Non-Detect	0.14
Variance Detects	56330	Percent Non-Detects	88.73%
Mean Detects	83.09	SD Detects	237.3
Median Detects	0.84	CV Detects	2.856
Skewness Detects	4.655	Kurtosis Detects	23.8
Mean of Logged Detects	1.036	SD of Logged Detects	3.017

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.393	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.93	Detected Data Not Normal at 5% Significance Leve	
Lilliefors Test Statistic	0.363	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.154	Detected Data Not Normal at 5% Significance Leve	
Detected Data Not Normal at 5% Significance Leve			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	9.398	KM Standard Error of Mean	4.986
KM SD	82.69	95% KM (BCA) UCL	19.12
95% KM (t) UCL	17.63	95% KM (Percentile Bootstrap) UCL	17.95
95% KM (z) UCL	17.6	95% KM Bootstrap t UCL	34.78
90% KM Chebyshev UCL	24.35	95% KM Chebyshev UCL	31.13
97.5% KM Chebyshev UCL	40.53	99% KM Chebyshev UCL	59

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	2.328	Anderson-Darling GOF Test	
5% A-D Critical Value	0.898	Detected Data Not Gamma Distributed at 5% Significance Leve	
K-S Test Statistic	0.259	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.172	Detected Data Not Gamma Distributed at 5% Significance Leve	
Detected Data Not Gamma Distributed at 5% Significance Leve			

Gamma Statistics on Detected Data Only

k hat (MLE)	0.215	k star (bias corrected MLE)	0.216
Theta hat (MLE)	386.5	Theta star (bias corrected MLE)	385.3
nu hat (MLE)	13.76	nu star (bias corrected)	13.8
Mean (detects)	83.09		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	9.371
Maximum	1300	Median	0.01
SD	82.84	CV	8.84
k hat (MLE)	0.127	k star (bias corrected MLE)	0.128
Theta hat (MLE)	73.91	Theta star (bias corrected MLE)	73.32
nu hat (MLE)	72.02	nu star (bias corrected)	72.6
Adjusted Level of Significance (β)	0.0492		
Approximate Chi Square Value (72.60, α)	53.98	Adjusted Chi Square Value (72.60, β)	53.89
95% Gamma Approximate UCL (use when n>=50)	12.6	95% Gamma Adjusted UCL (use when n<50)	12.62

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	9.398	SD (KM)	82.69
Variance (KM)	6838	SE of Mean (KM)	4.986
k hat (KM)	0.0129	k star (KM)	0.0151
nu hat (KM)	7.336	nu star (KM)	8.592

APPENDIX B-1D1
VOCs and TPH in Soil - All Areas except for Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH mg/kg

theta hat (KM)	727.6	theta star (KM)	621.3
80% gamma percentile (KM)	1.39E-04	90% gamma percentile (KM)	0.334
95% gamma percentile (KM)	12.12	99% gamma percentile (KM)	266.2
Gamma Kaplan-Meier (KM) Statistics			
Approximate Chi Square Value (8.59, α)	3.083	Adjusted Chi Square Value (8.59, β)	3.066
95% Gamma Approximate KM-UCL (use when n>=50)	26.2	95% Gamma Adjusted KM-UCL (use when n<50)	26.34
Lognormal GOF Test on Detected Observations Only			
Shapiro Wilk Test Statistic	0.895	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.93	Detected Data Not Lognormal at 5% Significance Leve	
Lilliefors Test Statistic	0.197	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.154	Detected Data Not Lognormal at 5% Significance Leve	
Detected Data Not Lognormal at 5% Significance Leve			
Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	9.364	Mean in Log Scale	-11.85
SD in Original Scale	82.84	SD in Log Scale	7.36
95% t UCL (assumes normality of ROS data)	17.48	95% Percentile Bootstrap UCL	18.81
95% BCA Bootstrap UCL	24.64	95% Bootstrap t UCL	35.28
95% H-UCL (Log ROS)	3.12E+08		
Statistics using KM estimates on Logged Data and Assuming Lognormal Distributior			
KM Mean (logged)	-2.739	KM Geo Mean	0.0647
KM SD (logged)	1.674	95% Critical H Value (KM-Log)	2.776
KM Standard Error of Mean (logged)	0.101	95% H-UCL (KM -Log)	0.346
KM SD (logged)	1.674	95% Critical H Value (KM-Log)	2.776
KM Standard Error of Mean (logged)	0.101		
DL/2 Statistics			
DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	9.389	Mean in Log Scale	-3.027
SD in Original Scale	82.84	SD in Log Scale	1.771
95% t UCL (Assumes normality)	17.5	95% H-Stat UCL	0.315
DL/2 is not a recommended method, provided for comparisons and historical reasons			
Nonparametric Distribution Free UCL Statistics			
Data do not follow a Discernible Distribution at 5% Significance Leve			
Suggested UCL to Use			
95% KM (Chebyshev) UCL	31.13		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
Recommendations are based upon data size, data distribution, and skewness
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statisticiar

APPENDIX B-1D1
VOCs and TPH in Soil - All Areas except for Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH mg/kg

Trichloroethene (TCE)

General Statistics

Total Number of Observations	283	Number of Distinct Observations	59
Number of Detects	4	Number of Non-Detects	279
Number of Distinct Detects	4	Number of Distinct Non-Detects	56
Minimum Detect	0.43	Minimum Non-Detect	0.18
Maximum Detect	3.5	Maximum Non-Detect	270
Variance Detects	1.71	Percent Non-Detects	98.59%
Mean Detects	1.908	SD Detects	1.308
Median Detects	1.85	CV Detects	0.686
Skewness Detects	0.221	Kurtosis Detects	-0.637
Mean of Logged Detects	0.395	SD of Logged Detects	0.907

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.996	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Normal at 5% Significance Leve	
Lilliefors Test Statistic	0.151	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.375	Detected Data appear Normal at 5% Significance Leve	
Detected Data appear Normal at 5% Significance Leve			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.206	KM Standard Error of Mean	0.0175
KM SD	0.25	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.235	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.235	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.259	95% KM Chebyshev UCL	0.282
97.5% KM Chebyshev UCL	0.315	99% KM Chebyshev UCL	0.38

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.23	Anderson-Darling GOF Test	
5% A-D Critical Value	0.66	Detected data appear Gamma Distributed at 5% Significance Leve	
K-S Test Statistic	0.195	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.398	Detected data appear Gamma Distributed at 5% Significance Leve	
Detected data appear Gamma Distributed at 5% Significance Leve			

Gamma Statistics on Detected Data Only

k hat (MLE)	2.142	k star (bias corrected MLE)	0.702
Theta hat (MLE)	0.891	Theta star (bias corrected MLE)	2.717
nu hat (MLE)	17.13	nu star (bias corrected)	5.617
Mean (detects)	1.908		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.0368
Maximum	3.5	Median	0.01
SD	0.262	CV	7.111
k hat (MLE)	0.513	k star (bias corrected MLE)	0.51
Theta hat (MLE)	0.0717	Theta star (bias corrected MLE)	0.0722
nu hat (MLE)	290.5	nu star (bias corrected)	288.7
Adjusted Level of Significance (β)	0.0492		
Approximate Chi Square Value (288.71, α)	250.4	Adjusted Chi Square Value (288.71, β)	250.2
95% Gamma Approximate UCL (use when n>=50)	0.0425	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.206	SD (KM)	0.25
Variance (KM)	0.0624	SE of Mean (KM)	0.0175
k hat (KM)	0.679	k star (KM)	0.674
nu hat (KM)	384.4	nu star (KM)	381.7

APPENDIX B-1D1
VOCs and TPH in Soil - All Areas except for Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH mg/kg

theta hat (KM)	0.303	theta star (KM)	0.305
80% gamma percentile (KM)	0.339	90% gamma percentile (KM)	0.521
95% gamma percentile (KM)	0.71	99% gamma percentile (KM)	1.163

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (381.68, α)	337.4	Adjusted Chi Square Value (381.68, β)	337.2
95% Gamma Approximate KM-UCL (use when n>=50)	0.233	95% Gamma Adjusted KM-UCL (use when n<50)	0.233

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.942	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Lognormal at 5% Significance Leve	
Lilliefors Test Statistic	0.224	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.375	Detected Data appear Lognormal at 5% Significance Leve	
Detected Data appear Lognormal at 5% Significance Leve			

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.0295	Mean in Log Scale	-8.536
SD in Original Scale	0.263	SD in Log Scale	2.856
95% t UCL (assumes normality of ROS data)	0.0553	95% Percentile Bootstrap UCL	0.0586
95% BCA Bootstrap UCL	0.0737	95% Bootstrap t UCL	0.0996
95% H-UCL (Log ROS)	0.0234		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distributior

KM Mean (logged)	-1.682	KM Geo Mean	0.186
KM SD (logged)	0.274	95% Critical H Value (KM-Log)	1.705
KM Standard Error of Mean (logged)	0.0194	95% H-UCL (KM -Log)	0.198
KM SD (logged)	0.274	95% Critical H Value (KM-Log)	1.705
KM Standard Error of Mean (logged)	0.0194		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	2.375	Mean in Log Scale	-1.346
SD in Original Scale	12.79	SD in Log Scale	1.118
95% t UCL (Assumes normality)	3.629	95% H-Stat UCL	0.564

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Detected Data appear Normal Distributed at 5% Significance Leve

Suggested UCL to Use

95% KM (t) UCL	0.235

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
Recommendations are based upon data size, data distribution, and skewness
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statisticiar

APPENDIX B-1D1
VOCs and TPH in Soil - All Areas except for Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH mg/kg

Vinyl Chloride

General Statistics

Total Number of Observations	282	Number of Distinct Observations	63
Number of Detects	1	Number of Non-Detects	281
Number of Distinct Detects	1	Number of Distinct Non-Detects	63

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set
It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV)

The data set for variable Z was not processed!

APPENDIX B-1D1
VOCs and TPH in Soil - All Areas except for Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH mg/kg

Xylenes, Total

General Statistics			
Total Number of Observations	283	Number of Distinct Observations	53
Number of Detects	7	Number of Non-Detects	276
Number of Distinct Detects	7	Number of Distinct Non-Detects	46
Minimum Detect	3.6	Minimum Non-Detect	0.47
Maximum Detect	4300	Maximum Non-Detect	540
Variance Detects	2577405	Percent Non-Detects	97.53%
Mean Detects	1716	SD Detects	1605
Median Detects	1700	CV Detects	0.935
Skewness Detects	0.561	Kurtosis Detects	-0.921
Mean of Logged Detects	6.366	SD of Logged Detects	2.452

Normal GOF Test on Detects Only		
Shapiro Wilk Test Statistic	0.92	Shapiro Wilk GOF Test
5% Shapiro Wilk Critical Value	0.803	Detected Data appear Normal at 5% Significance Leve
Lilliefors Test Statistic	0.228	Lilliefors GOF Test
5% Lilliefors Critical Value	0.304	Detected Data appear Normal at 5% Significance Leve
Detected Data appear Normal at 5% Significance Leve		

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
KM Mean	42.93	KM Standard Error of Mean	22.76
KM SD	354.5	95% KM (BCA) UCL	84.97
95% KM (t) UCL	80.49	95% KM (Percentile Bootstrap) UCL	81.8
95% KM (z) UCL	80.37	95% KM Bootstrap t UCL	94.59
90% KM Chebyshev UCL	111.2	95% KM Chebyshev UCL	142.1
97.5% KM Chebyshev UCL	185.1	99% KM Chebyshev UCL	269.4

Gamma GOF Tests on Detected Observations Only		
A-D Test Statistic	0.405	Anderson-Darling GOF Test
5% A-D Critical Value	0.747	Detected data appear Gamma Distributed at 5% Significance Leve
K-S Test Statistic	0.24	Kolmogorov-Smirnov GOF
5% K-S Critical Value	0.326	Detected data appear Gamma Distributed at 5% Significance Leve
Detected data appear Gamma Distributed at 5% Significance Leve		

Gamma Statistics on Detected Data Only			
k hat (MLE)	0.575	k star (bias corrected MLE)	0.424
Theta hat (MLE)	2985	Theta star (bias corrected MLE)	4050
nu hat (MLE)	8.048	nu star (bias corrected)	5.932
Mean (detects)	1716		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	42.46
Maximum	4300	Median	0.01
SD	355.2	CV	8.365
k hat (MLE)	0.1	k star (bias corrected MLE)	0.102
Theta hat (MLE)	422.8	Theta star (bias corrected MLE)	417.4
nu hat (MLE)	56.84	nu star (bias corrected)	57.57
Adjusted Level of Significance (β)	0.0492		
Approximate Chi Square Value (57.57, α)	41.13	Adjusted Chi Square Value (57.57, β)	41.06
95% Gamma Approximate UCL (use when n>=50)	59.43	95% Gamma Adjusted UCL (use when n<50)	59.54

Estimates of Gamma Parameters using KM Estimates			
Mean (KM)	42.93	SD (KM)	354.5
Variance (KM)	125664	SE of Mean (KM)	22.76
k hat (KM)	0.0147	k star (KM)	0.0169
nu hat (KM)	8.3	nu star (KM)	9.545

APPENDIX B-1D1
VOCs and TPH in Soil - All Areas except for Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH mg/kg

theta hat (KM)	2927	theta star (KM)	2545
80% gamma percentile (KM)	0.0026	90% gamma percentile (KM)	2.807
95% gamma percentile (KM)	71.12	99% gamma percentile (KM)	1215

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (9.55, α)	3.66	Adjusted Chi Square Value (9.55, β)	3.641
95% Gamma Approximate KM-UCL (use when n>=50)	112	95% Gamma Adjusted KM-UCL (use when n<50)	112.5

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.789	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.803	Detected Data Not Lognormal at 5% Significance Leve	
Lilliefors Test Statistic	0.27	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.304	Detected Data appear Lognormal at 5% Significance Leve	

Detected Data appear Approximate Lognormal at 5% Significance Leve

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	42.55	Mean in Log Scale	-9.766
SD in Original Scale	355.2	SD in Log Scale	5.829
95% t UCL (assumes normality of ROS data)	77.39	95% Percentile Bootstrap UCL	78.34
95% BCA Bootstrap UCL	96.09	95% Bootstrap t UCL	127.5
95% H-UCL (Log ROS)	21172		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distributior

KM Mean (logged)	-0.578	KM Geo Mean	0.561
KM SD (logged)	1.163	95% Critical H Value (KM-Log)	2.275
KM Standard Error of Mean (logged)	0.0748	95% H-UCL (KM -Log)	1.291
KM SD (logged)	1.163	95% Critical H Value (KM-Log)	2.275
KM Standard Error of Mean (logged)	0.0748		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	45.69	Mean in Log Scale	-0.36
SD in Original Scale	355.5	SD in Log Scale	1.379
95% t UCL (Assumes normality)	80.56	95% H-Stat UCL	2.213

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Detected Data appear Normal Distributed at 5% Significance Leve

Suggested UCL to Use
95% KM (t) UCL 80.49

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
Recommendations are based upon data size, data distribution, and skewness
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statisticiar

APPENDIX B-1D2
VOCs and TPH in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH mg/kg

111TCA

General Statistics

Total Number of Observations	60	Number of Distinct Observations	32
Number of Detects	1	Number of Non-Detects	59
Number of Distinct Detects	1	Number of Distinct Non-Detects	31

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set
It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV)

The data set for variable A was not processed!

APPENDIX B-1D2
VOCs and TPH in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH mg/kg

112TC122TF

General Statistics

Total Number of Observations	60	Number of Distinct Observations	32
Number of Detects	0	Number of Non-Detects	60
Number of Distinct Detects	0	Number of Distinct Non-Detects	32

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable B was not processed!

APPENDIX B-1D2
VOCs and TPH in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH mg/kg

11DCA

General Statistics

Total Number of Observations	60	Number of Distinct Observations	32
Number of Detects	1	Number of Non-Detects	59
Number of Distinct Detects	1	Number of Distinct Non-Detects	31

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!
It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable C was not processed!

APPENDIX B-1D2
VOCs and TPH in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH mg/kg

124TMB

General Statistics

Total Number of Observations	60	Number of Distinct Observations	38
Number of Detects	2	Number of Non-Detects	58
Number of Distinct Detects	2	Number of Distinct Non-Detects	36
Minimum Detect	1800	Minimum Non-Detect	0.66
Maximum Detect	8600	Maximum Non-Detect	210
Variance Detects	23120000	Percent Non-Detects	96.67%
Mean Detects	5200	SD Detects	4808
Median Detects	5200	CV Detects	0.925
Skewness Detects	N/A	Kurtosis Detects	N/A
Mean of Logged Detects	8.278	SD of Logged Detects	1.106

Warning: Data set has only 2 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates

Normal GOF Test on Detects Only
Not Enough Data to Perform GOF Test

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	174	KM Standard Error of Mean	204.6
KM SD	1121	95% KM (BCA) UCL	N/A
95% KM (t) UCL	516	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	510.6	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	787.9	95% KM Chebyshev UCL	1066
97.5% KM Chebyshev UCL	1452	99% KM Chebyshev UCL	2210

Gamma GOF Tests on Detected Observations Only
Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	1.943	k star (bias corrected MLE)	N/A
Theta hat (MLE)	2676	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	7.772	nu star (bias corrected)	N/A
Mean (detects)	5200		

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	174	SD (KM)	1121
Variance (KM)	1256401	SE of Mean (KM)	204.6
k hat (KM)	0.0241	k star (KM)	0.034
nu hat (KM)	2.891	nu star (KM)	4.08
theta hat (KM)	7222	theta star (KM)	5117
80% gamma percentile (KM)	4.169	90% gamma percentile (KM)	136.6
95% gamma percentile (KM)	748.9	99% gamma percentile (KM)	4334

Gamma Kaplan-Meier (KM) Statistics

		Adjusted Level of Significance (β)	0.046
Approximate Chi Square Value (4.08, α)	0.753	Adjusted Chi Square Value (4.08, β)	0.721
95% Gamma Approximate KM-UCL (use when n>=50)	942.1	95% Gamma Adjusted KM-UCL (use when n<50)	985

Lognormal GOF Test on Detected Observations Only
Not Enough Data to Perform GOF Test

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	173.4	Mean in Log Scale	-3.708
SD in Original Scale	1130	SD in Log Scale	3.131
95% t UCL (assumes normality of ROS data)	417.3	95% Percentile Bootstrap UCL	460.1
95% BCA Bootstrap UCL	633.4	95% Bootstrap t UCL	829815
95% H-UCL (Log ROS)	36.21		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distributior

APPENDIX B-1D2
VOCs and TPH in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH mg/kg

KM Mean (logged)	-0.126	KM Geo Mean	0.882
KM SD (logged)	1.567	95% Critical H Value (KM-Log)	3.281
KM Standard Error of Mean (logged)	0.286	95% H-UCL (KM -Log)	5.879
KM SD (logged)	1.567	95% Critical H Value (KM-Log)	3.281
KM Standard Error of Mean (logged)	0.286		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	180.8	Mean in Log Scale	0.0482
SD in Original Scale	1129	SD in Log Scale	2.242
95% t UCL (Assumes normality)	424.5	95% H-Stat UCL	45.97

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Data do not follow a Discernible Distribution at 5% Significance Leve

Suggested UCL to Use
95% KM (Chebyshev) UCL 1066

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
Recommendations are based upon data size, data distribution, and skewness
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statisticiar

APPENDIX B-1D2
VOCs and TPH in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH mg/kg

135TMB

General Statistics

Total Number of Observations	60	Number of Distinct Observations	38
Number of Detects	2	Number of Non-Detects	58
Number of Distinct Detects	2	Number of Distinct Non-Detects	36
Minimum Detect	480	Minimum Non-Detect	0.66
Maximum Detect	1800	Maximum Non-Detect	210
Variance Detects	871200	Percent Non-Detects	96.67%
Mean Detects	1140	SD Detects	933.4
Median Detects	1140	CV Detects	0.819
Skewness Detects	N/A	Kurtosis Detects	N/A
Mean of Logged Detects	6.835	SD of Logged Detects	0.935

Warning: Data set has only 2 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates

Normal GOF Test on Detects Only
Not Enough Data to Perform GOF Test

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	38.64	KM Standard Error of Mean	43.34
KM SD	237.4	95% KM (BCA) UCL	N/A
95% KM (t) UCL	111.1	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	109.9	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	168.7	95% KM Chebyshev UCL	227.5
97.5% KM Chebyshev UCL	309.3	99% KM Chebyshev UCL	469.9

Gamma GOF Tests on Detected Observations Only
Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	2.604	k star (bias corrected MLE)	N/A
Theta hat (MLE)	437.8	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	10.42	nu star (bias corrected)	N/A
Mean (detects)	1140		

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	38.64	SD (KM)	237.4
Variance (KM)	56348	SE of Mean (KM)	43.34
k hat (KM)	0.0265	k star (KM)	0.0363
nu hat (KM)	3.179	nu star (KM)	4.354
theta hat (KM)	1458	theta star (KM)	1065
80% gamma percentile (KM)	1.315	90% gamma percentile (KM)	34.82
95% gamma percentile (KM)	174.4	99% gamma percentile (KM)	943.3

Gamma Kaplan-Meier (KM) Statistics

		Adjusted Level of Significance (β)	0.046
Approximate Chi Square Value (4.35, α)	0.866	Adjusted Chi Square Value (4.35, β)	0.83
95% Gamma Approximate KM-UCL (use when n>=50)	194.2	95% Gamma Adjusted KM-UCL (use when n<50)	202.7

Lognormal GOF Test on Detected Observations Only
Not Enough Data to Perform GOF Test

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	38.11	Mean in Log Scale	-3.295
SD in Original Scale	239.5	SD in Log Scale	2.646
95% t UCL (assumes normality of ROS data)	89.77	95% Percentile Bootstrap UCL	98.05
95% BCA Bootstrap UCL	150.1	95% Bootstrap t UCL	48655
95% H-UCL (Log ROS)	7.288		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distributior

APPENDIX B-1D2
VOCs and TPH in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH mg/kg

KM Mean (logged)	-0.174	KM Geo Mean	0.84
KM SD (logged)	1.307	95% Critical H Value (KM-Log)	2.945
KM Standard Error of Mean (logged)	0.239	95% H-UCL (KM -Log)	3.259
KM SD (logged)	1.307	95% Critical H Value (KM-Log)	2.945
KM Standard Error of Mean (logged)	0.239		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	45.51	Mean in Log Scale	9.32E-05
SD in Original Scale	239.3	SD in Log Scale	2.07
95% t UCL (Assumes normality)	97.13	95% H-Stat UCL	25.11

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Data do not follow a Discernible Distribution at 5% Significance Leve

Suggested UCL to Use
95% KM (Chebyshev) UCL 227.5

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
Recommendations are based upon data size, data distribution, and skewness
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statisticiar

APPENDIX B-1D2
VOCs and TPH in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH mg/kg

2Butanone

General Statistics

Total Number of Observations	60	Number of Distinct Observations	36
Number of Detects	5	Number of Non-Detects	55
Number of Distinct Detects	5	Number of Distinct Non-Detects	31
Minimum Detect	6.9	Minimum Non-Detect	3.3
Maximum Detect	46	Maximum Non-Detect	6000
Variance Detects	277.4	Percent Non-Detects	91.67%
Mean Detects	16.94	SD Detects	16.66
Median Detects	8	CV Detects	0.983
Skewness Detects	1.988	Kurtosis Detects	3.966
Mean of Logged Detects	2.533	SD of Logged Detects	0.796

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.705	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.762	Detected Data Not Normal at 5% Significance Leve	
Lilliefors Test Statistic	0.323	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.343	Detected Data appear Normal at 5% Significance Leve	
Detected Data appear Approximate Normal at 5% Significance Leve			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	4.667	KM Standard Error of Mean	0.987
KM SD	6.24	95% KM (BCA) UCL	6.668
95% KM (t) UCL	6.316	95% KM (Percentile Bootstrap) UCL	6.415
95% KM (z) UCL	6.29	95% KM Bootstrap t UCL	8.313
90% KM Chebyshev UCL	7.628	95% KM Chebyshev UCL	8.969
97.5% KM Chebyshev UCL	10.83	99% KM Chebyshev UCL	14.49

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.663	Anderson-Darling GOF Test	
5% A-D Critical Value	0.685	Detected data appear Gamma Distributed at 5% Significance Leve	
K-S Test Statistic	0.34	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.361	Detected data appear Gamma Distributed at 5% Significance Leve	
Detected data appear Gamma Distributed at 5% Significance Leve			

Gamma Statistics on Detected Data Only

k hat (MLE)	1.836	k star (bias corrected MLE)	0.868
Theta hat (MLE)	9.227	Theta star (bias corrected MLE)	19.52
nu hat (MLE)	18.36	nu star (bias corrected)	8.677
Mean (detects)	16.94		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	1.421
Maximum	46	Median	0.01
SD	6.409	CV	4.511
k hat (MLE)	0.173	k star (bias corrected MLE)	0.175
Theta hat (MLE)	8.232	Theta star (bias corrected MLE)	8.116
nu hat (MLE)	20.71	nu star (bias corrected)	21.01
Adjusted Level of Significance (β)	0.046		
Approximate Chi Square Value (21.01, α)	11.6	Adjusted Chi Square Value (21.01, β)	11.43
95% Gamma Approximate UCL (use when n>=50)	2.574	95% Gamma Adjusted UCL (use when n<50)	2.613

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	4.667	SD (KM)	6.24
Variance (KM)	38.94	SE of Mean (KM)	0.987
k hat (KM)	0.559	k star (KM)	0.543
nu hat (KM)	67.13	nu star (KM)	65.11

APPENDIX B-1D2
VOCs and TPH in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH mg/kg

theta hat (KM)	8.343	theta star (KM)	8.602
80% gamma percentile (KM)	7.686	90% gamma percentile (KM)	12.41
95% gamma percentile (KM)	17.41	99% gamma percentile (KM)	29.62

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (65.11, α)	47.54	Adjusted Chi Square Value (65.11, β)	47.17
95% Gamma Approximate KM-UCL (use when n>=50)	6.392	95% Gamma Adjusted KM-UCL (use when n<50)	6.442

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.812	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.762	Detected Data appear Lognormal at 5% Significance Leve	
Lilliefors Test Statistic	0.316	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.343	Detected Data appear Lognormal at 5% Significance Leve	
Detected Data appear Lognormal at 5% Significance Leve			

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	1.634	Mean in Log Scale	-1.505
SD in Original Scale	6.366	SD in Log Scale	1.583
95% t UCL (assumes normality of ROS data)	3.007	95% Percentile Bootstrap UCL	3.131
95% BCA Bootstrap UCL	3.891	95% Bootstrap t UCL	6.693
95% H-UCL (Log ROS)	1.533		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distributior

KM Mean (logged)	1.329	KM Geo Mean	3.775
KM SD (logged)	0.461	95% Critical H Value (KM-Log)	1.872
KM Standard Error of Mean (logged)	0.073	95% H-UCL (KM -Log)	4.698
KM SD (logged)	0.461	95% Critical H Value (KM-Log)	1.872
KM Standard Error of Mean (logged)	0.073		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	141.2	Mean in Log Scale	1.818
SD in Original Scale	449.5	SD in Log Scale	2.154
95% t UCL (Assumes normality)	238.2	95% H-Stat UCL	201.4

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Detected Data appear Approximate Normal Distributed at 5% Significance Leve

Suggested UCL to Use

95% KM (t) UCL	6.316

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF tes
When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCI

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
Recommendations are based upon data size, data distribution, and skewness
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician

APPENDIX B-1D2
VOCs and TPH in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH mg/kg

4-Isopropyltoluene

General Statistics

Total Number of Observations	60	Number of Distinct Observations	33
Number of Detects	3	Number of Non-Detects	57
Number of Distinct Detects	3	Number of Distinct Non-Detects	30
Minimum Detect	0.82	Minimum Non-Detect	0.33
Maximum Detect	2100	Maximum Non-Detect	210
Variance Detects	1242650	Percent Non-Detects	95%
Mean Detects	833.6	SD Detects	1115
Median Detects	400	CV Detects	1.337
Skewness Detects	1.486	Kurtosis Detects	N/A
Mean of Logged Detects	4.481	SD of Logged Detects	4.136

Warning: Data set has only 3 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.887	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Normal at 5% Significance Leve	
Lilliefors Test Statistic	0.318	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.425	Detected Data appear Normal at 5% Significance Leve	

Detected Data appear Normal at 5% Significance Leve

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	42	KM Standard Error of Mean	43.13
KM SD	272.8	95% KM (BCA) UCL	N/A
95% KM (t) UCL	114.1	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	112.9	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	171.4	95% KM Chebyshev UCL	230
97.5% KM Chebyshev UCL	311.3	99% KM Chebyshev UCL	471.1

Gamma GOF Tests on Detected Observations Only
Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	0.306	k star (bias corrected MLE)	N/A
Theta hat (MLE)	2723	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	1.837	nu star (bias corrected)	N/A
Mean (detects)	833.6		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	41.69
Maximum	2100	Median	0.01
SD	275.1	CV	6.599
k hat (MLE)	0.103	k star (bias corrected MLE)	0.109
Theta hat (MLE)	405.9	Theta star (bias corrected MLE)	383.6
nu hat (MLE)	12.32	nu star (bias corrected)	13.04
Adjusted Level of Significance (β)	0.046		
Approximate Chi Square Value (13.04, α)	5.92	Adjusted Chi Square Value (13.04, β)	5.802
95% Gamma Approximate UCL (use when n>=50)	91.83	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	42	SD (KM)	272.8
Variance (KM)	74403	SE of Mean (KM)	43.13
k hat (KM)	0.0237	k star (KM)	0.0336
nu hat (KM)	2.844	nu star (KM)	4.035

APPENDIX B-1D2
VOCs and TPH in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH mg/kg

theta hat (KM)	1772	theta star (KM)	1249
80% gamma percentile (KM)	0.947	90% gamma percentile (KM)	32.19
95% gamma percentile (KM)	179.3	99% gamma percentile (KM)	1050

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (4.04, α)	0.736	Adjusted Chi Square Value (4.04, β)	0.703
95% Gamma Approximate KM-UCL (use when n>=50)	230.3	95% Gamma Adjusted KM-UCL (use when n<50)	240.9

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.9	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Lognormal at 5% Significance Leve	
Lilliefors Test Statistic	0.309	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.425	Detected Data appear Lognormal at 5% Significance Leve	
Detected Data appear Lognormal at 5% Significance Leve			

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	41.68	Mean in Log Scale	-22.82
SD in Original Scale	275.1	SD in Log Scale	8.936
95% t UCL (assumes normality of ROS data)	101	95% Percentile Bootstrap UCL	111.7
95% BCA Bootstrap UCL	175	95% Bootstrap t UCL	108328
95% H-UCL (Log ROS)	4.42E+14		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distributior

KM Mean (logged)	-0.827	KM Geo Mean	0.437
KM SD (logged)	1.434	95% Critical H Value (KM-Log)	3.117
KM Standard Error of Mean (logged)	0.227	95% H-UCL (KM -Log)	2.187
KM SD (logged)	1.434	95% Critical H Value (KM-Log)	3.117
KM Standard Error of Mean (logged)	0.227		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	49.01	Mean in Log Scale	-0.557
SD in Original Scale	274.9	SD in Log Scale	2.319
95% t UCL (Assumes normality)	108.3	95% H-Stat UCL	32.79

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Detected Data appear Normal Distributed at 5% Significance Leve

Suggested UCL to Use

95% KM (t) UCL	114.1

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
Recommendations are based upon data size, data distribution, and skewness
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statisticiar

APPENDIX B-1D2
VOCs and TPH in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH mg/kg

4-Methyl-2-pentanone

General Statistics			
Total Number of Observations	60	Number of Distinct Observations	23
Number of Detects	0	Number of Non-Detects	60
Number of Distinct Detects	0	Number of Distinct Non-Detects	23

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV)

The data set for variable H was not processed!

APPENDIX B-1D2
VOCs and TPH in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH mg/kg

Benzene

General Statistics

Total Number of Observations	60	Number of Distinct Observations	32
Number of Detects	5	Number of Non-Detects	55
Number of Distinct Detects	4	Number of Distinct Non-Detects	29
Minimum Detect	0.45	Minimum Non-Detect	0.33
Maximum Detect	82	Maximum Non-Detect	600
Variance Detects	1322	Percent Non-Detects	91.67%
Mean Detects	16.96	SD Detects	36.36
Median Detects	0.6	CV Detects	2.144
Skewness Detects	2.236	Kurtosis Detects	4.998
Mean of Logged Detects	0.512	SD of Logged Detects	2.22

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.56	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.762	Detected Data Not Normal at 5% Significance Leve	
Lilliefors Test Statistic	0.467	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.343	Detected Data Not Normal at 5% Significance Leve	
Detected Data Not Normal at 5% Significance Leve			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	1.873	KM Standard Error of Mean	1.675
KM SD	11.01	95% KM (BCA) UCL	N/A
95% KM (t) UCL	4.672	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	4.628	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	6.897	95% KM Chebyshev UCL	9.173
97.5% KM Chebyshev UCL	12.33	99% KM Chebyshev UCL	18.54

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	1.035	Anderson-Darling GOF Test	
5% A-D Critical Value	0.74	Detected Data Not Gamma Distributed at 5% Significance Leve	
K-S Test Statistic	0.44	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.38	Detected Data Not Gamma Distributed at 5% Significance Leve	
Detected Data Not Gamma Distributed at 5% Significance Leve			

Gamma Statistics on Detected Data Only

k hat (MLE)	0.298	k star (bias corrected MLE)	0.252
Theta hat (MLE)	56.96	Theta star (bias corrected MLE)	67.18
nu hat (MLE)	2.978	nu star (bias corrected)	2.524
Mean (detects)	16.96		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	1.423
Maximum	82	Median	0.01
SD	10.58	CV	7.438
k hat (MLE)	0.167	k star (bias corrected MLE)	0.17
Theta hat (MLE)	8.52	Theta star (bias corrected MLE)	8.381
nu hat (MLE)	20.04	nu star (bias corrected)	20.37
Adjusted Level of Significance (β)	0.046		
Approximate Chi Square Value (20.37, α)	11.12	Adjusted Chi Square Value (20.37, β)	10.95
95% Gamma Approximate UCL (use when n>=50)	2.605	95% Gamma Adjusted UCL (use when n<50)	2.645

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	1.873	SD (KM)	11.01
Variance (KM)	121.2	SE of Mean (KM)	1.675
k hat (KM)	0.029	k star (KM)	0.0386
nu hat (KM)	3.474	nu star (KM)	4.634

APPENDIX B-1D2
VOCs and TPH in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH mg/kg

theta hat (KM)	64.69	theta star (KM)	48.5
80% gamma percentile (KM)	0.0871	90% gamma percentile (KM)	1.905
95% gamma percentile (KM)	8.8	99% gamma percentile (KM)	44.8

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (4.63, α)	0.987	Adjusted Chi Square Value (4.63, β)	0.948
95% Gamma Approximate KM-UCL (use when n>=50)	8.793	95% Gamma Adjusted KM-UCL (use when n<50)	9.16

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.7	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.762	Detected Data Not Lognormal at 5% Significance Leve	
Lilliefors Test Statistic	0.345	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.343	Detected Data Not Lognormal at 5% Significance Leve	
Detected Data Not Lognormal at 5% Significance Leve			

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	1.414	Mean in Log Scale	-8.001
SD in Original Scale	10.58	SD in Log Scale	3.385
95% t UCL (assumes normality of ROS data)	3.697	95% Percentile Bootstrap UCL	4.138
95% BCA Bootstrap UCL	6.89	95% Bootstrap t UCL	155.4
95% H-UCL (Log ROS)	1.633		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distributior

KM Mean (logged)	-0.952	KM Geo Mean	0.386
KM SD (logged)	0.767	95% Critical H Value (KM-Log)	2.102
KM Standard Error of Mean (logged)	0.117	95% H-UCL (KM -Log)	0.639
KM SD (logged)	0.767	95% Critical H Value (KM-Log)	2.102
KM Standard Error of Mean (logged)	0.117		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	15.01	Mean in Log Scale	-0.552
SD in Original Scale	45.81	SD in Log Scale	2.187
95% t UCL (Assumes normality)	24.89	95% H-Stat UCL	20.99

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Data do not follow a Discernible Distribution at 5% Significance Leve

Suggested UCL to Use
95% KM (Chebyshev) UCL 9.173

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
Recommendations are based upon data size, data distribution, and skewness
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statisticiar

APPENDIX B-1D2
VOCs and TPH in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH mg/kg

Carbon disulfide

General Statistics

Total Number of Observations	60	Number of Distinct Observations	40
Number of Detects	4	Number of Non-Detects	56
Number of Distinct Detects	4	Number of Distinct Non-Detects	37
Minimum Detect	1.2	Minimum Non-Detect	0.66
Maximum Detect	210	Maximum Non-Detect	1500
Variance Detects	10841	Percent Non-Detects	93.33%
Mean Detects	53.83	SD Detects	104.1
Median Detects	2.05	CV Detects	1.934
Skewness Detects	2	Kurtosis Detects	3.999
Mean of Logged Detects	1.715	SD of Logged Detects	2.447

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.635	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.748	Detected Data Not Normal at 5% Significance Leve	
Lilliefors Test Statistic	0.438	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.375	Detected Data Not Normal at 5% Significance Leve	
Detected Data Not Normal at 5% Significance Leve			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	4.603	KM Standard Error of Mean	4.434
KM SD	28.22	95% KM (BCA) UCL	N/A
95% KM (t) UCL	12.01	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	11.9	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	17.9	95% KM Chebyshev UCL	23.93
97.5% KM Chebyshev UCL	32.29	99% KM Chebyshev UCL	48.72

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.769	Anderson-Darling GOF Test	
5% A-D Critical Value	0.704	Detected Data Not Gamma Distributed at 5% Significance Leve	
K-S Test Statistic	0.438	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.418	Detected Data Not Gamma Distributed at 5% Significance Leve	
Detected Data Not Gamma Distributed at 5% Significance Leve			

Gamma Statistics on Detected Data Only

k hat (MLE)	0.303	k star (bias corrected MLE)	0.242
Theta hat (MLE)	177.6	Theta star (bias corrected MLE)	222
nu hat (MLE)	2.425	nu star (bias corrected)	1.94
Mean (detects)	53.83		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	3.598
Maximum	210	Median	0.01
SD	27.1	CV	7.533
k hat (MLE)	0.142	k star (bias corrected MLE)	0.146
Theta hat (MLE)	25.37	Theta star (bias corrected MLE)	24.67
nu hat (MLE)	17.02	nu star (bias corrected)	17.5
Adjusted Level of Significance (β)	0.046		
Approximate Chi Square Value (17.50, α)	9.03	Adjusted Chi Square Value (17.50, β)	8.88
95% Gamma Approximate UCL (use when n>=50)	6.972	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	4.603	SD (KM)	28.22
Variance (KM)	796.1	SE of Mean (KM)	4.434
k hat (KM)	0.0266	k star (KM)	0.0364
nu hat (KM)	3.193	nu star (KM)	4.367

APPENDIX B-1D2
VOCs and TPH in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH mg/kg

theta hat (KM)	173	theta star (KM)	126.5
80% gamma percentile (KM)	0.159	90% gamma percentile (KM)	4.173
95% gamma percentile (KM)	20.81	99% gamma percentile (KM)	112.3

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (4.37, α)	0.872	Adjusted Chi Square Value (4.37, β)	0.835
95% Gamma Approximate KM-UCL (use when n>=50)	23.06	95% Gamma Adjusted KM-UCL (use when n<50)	24.06

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.745	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.748	Detected Data Not Lognormal at 5% Significance Leve	
Lilliefors Test Statistic	0.366	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.375	Detected Data appear Lognormal at 5% Significance Leve	

Detected Data appear Approximate Lognormal at 5% Significance Leve

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	3.589	Mean in Log Scale	-9.418
SD in Original Scale	27.1	SD in Log Scale	3.69
95% t UCL (assumes normality of ROS data)	9.436	95% Percentile Bootstrap UCL	10.57
95% BCA Bootstrap UCL	14.14	95% Bootstrap t UCL	446.4
95% H-UCL (Log ROS)	1.877		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distributior

KM Mean (logged)	-0.254	KM Geo Mean	0.776
KM SD (logged)	0.804	95% Critical H Value (KM-Log)	2.137
KM Standard Error of Mean (logged)	0.127	95% H-UCL (KM -Log)	1.341
KM SD (logged)	0.804	95% Critical H Value (KM-Log)	2.137
KM Standard Error of Mean (logged)	0.127		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	37.42	Mean in Log Scale	0.187
SD in Original Scale	114.5	SD in Log Scale	2.269
95% t UCL (Assumes normality)	62.12	95% H-Stat UCL	57.81

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Detected Data appear Approximate Lognormal Distributed at 5% Significance Leve

Suggested UCL to Use
95% KM (Chebyshev) UCL 23.93

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
Recommendations are based upon data size, data distribution, and skewness
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statisticiar

APPENDIX B-1D2
VOCs and TPH in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH mg/kg

Chloroethane

General Statistics

Total Number of Observations	60	Number of Distinct Observations	39
Number of Detects	1	Number of Non-Detects	59
Number of Distinct Detects	1	Number of Distinct Non-Detects	38

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set
It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV)

The data set for variable K was not processed!

APPENDIX B-1D2
VOCs and TPH in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH mg/kg

Chloroform

General Statistics

Total Number of Observations	60	Number of Distinct Observations	32
Number of Detects	0	Number of Non-Detects	60
Number of Distinct Detects	0	Number of Distinct Non-Detects	32

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV)

The data set for variable L was not processed!

APPENDIX B-1D2
VOCs and TPH in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH mg/kg

cis-1,2-Dichloroethene

General Statistics

Total Number of Observations	60	Number of Distinct Observations	32
Number of Detects	1	Number of Non-Detects	59
Number of Distinct Detects	1	Number of Distinct Non-Detects	31

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set
It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV)

The data set for variable M was not processed!

APPENDIX B-1D2
VOCs and TPH in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH mg/kg

Ethylbenzene

General Statistics

Total Number of Observations	60	Number of Distinct Observations	32
Number of Detects	4	Number of Non-Detects	56
Number of Distinct Detects	4	Number of Distinct Non-Detects	28
Minimum Detect	0.91	Minimum Non-Detect	0.33
Maximum Detect	730	Maximum Non-Detect	210
Variance Detects	136148	Percent Non-Detects	93.33%
Mean Detects	345	SD Detects	369
Median Detects	324.5	CV Detects	1.07
Skewness Detects	0.102	Kurtosis Detects	-5.177
Mean of Logged Detects	4.239	SD of Logged Detects	3.105

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.852	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Normal at 5% Significance Leve	
Lilliefors Test Statistic	0.281	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.375	Detected Data appear Normal at 5% Significance Leve	
Detected Data appear Normal at 5% Significance Leve			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	23.4	KM Standard Error of Mean	17.77
KM SD	119.2	95% KM (BCA) UCL	N/A
95% KM (t) UCL	53.09	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	52.62	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	76.7	95% KM Chebyshev UCL	100.8
97.5% KM Chebyshev UCL	134.4	99% KM Chebyshev UCL	200.2

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.386	Anderson-Darling GOF Test	
5% A-D Critical Value	0.692	Detected data appear Gamma Distributed at 5% Significance Leve	
K-S Test Statistic	0.311	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.414	Detected data appear Gamma Distributed at 5% Significance Leve	
Detected data appear Gamma Distributed at 5% Significance Leve			

Gamma Statistics on Detected Data Only

k hat (MLE)	0.409	k star (bias corrected MLE)	0.269
Theta hat (MLE)	844	Theta star (bias corrected MLE)	1283
nu hat (MLE)	3.27	nu star (bias corrected)	2.151
Mean (detects)	345		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	23.01
Maximum	730	Median	0.01
SD	120.2	CV	5.225
k hat (MLE)	0.112	k star (bias corrected MLE)	0.117
Theta hat (MLE)	205.6	Theta star (bias corrected MLE)	195.9
nu hat (MLE)	13.43	nu star (bias corrected)	14.09
Adjusted Level of Significance (β)	0.046		
Approximate Chi Square Value (14.09, α)	6.635	Adjusted Chi Square Value (14.09, β)	6.509
95% Gamma Approximate UCL (use when n>=50)	48.87	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	23.4	SD (KM)	119.2
Variance (KM)	14199	SE of Mean (KM)	17.77
k hat (KM)	0.0386	k star (KM)	0.0477
nu hat (KM)	4.628	nu star (KM)	5.729

APPENDIX B-1D2
VOCs and TPH in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH mg/kg

theta hat (KM)	606.8	theta star (KM)	490.1
80% gamma percentile (KM)	2.684	90% gamma percentile (KM)	33.56
95% gamma percentile (KM)	122.3	99% gamma percentile (KM)	518.3

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (5.73, α)	1.503	Adjusted Chi Square Value (5.73, β)	1.451
95% Gamma Approximate KM-UCL (use when n>=50)	89.19	95% Gamma Adjusted KM-UCL (use when n<50)	92.39

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.858	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Lognormal at 5% Significance Leve	
Lilliefors Test Statistic	0.255	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.375	Detected Data appear Lognormal at 5% Significance Leve	
Detected Data appear Lognormal at 5% Significance Leve			

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	23	Mean in Log Scale	-11.55
SD in Original Scale	120.2	SD in Log Scale	5.773
95% t UCL (assumes normality of ROS data)	48.94	95% Percentile Bootstrap UCL	50.66
95% BCA Bootstrap UCL	67.97	95% Bootstrap t UCL	370.5
95% H-UCL (Log ROS)	438572		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distributior

KM Mean (logged)	-0.742	KM Geo Mean	0.476
KM SD (logged)	1.516	95% Critical H Value (KM-Log)	3.212
KM Standard Error of Mean (logged)	0.228	95% H-UCL (KM -Log)	2.834
KM SD (logged)	1.516	95% Critical H Value (KM-Log)	3.212
KM Standard Error of Mean (logged)	0.228		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	29.94	Mean in Log Scale	-0.554
SD in Original Scale	120.8	SD in Log Scale	2.308
95% t UCL (Assumes normality)	56	95% H-Stat UCL	31.67

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Detected Data appear Normal Distributed at 5% Significance Leve

Suggested UCL to Use

95% KM (t) UCL	53.09

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
Recommendations are based upon data size, data distribution, and skewness
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statisticiar

APPENDIX B-1D2
VOCs and TPH in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH mg/kg

Isopropylbenzene

General Statistics			
Total Number of Observations	60	Number of Distinct Observations	33
Number of Detects	6	Number of Non-Detects	54
Number of Distinct Detects	6	Number of Distinct Non-Detects	27
Minimum Detect	0.77	Minimum Non-Detect	0.33
Maximum Detect	1200	Maximum Non-Detect	210
Variance Detects	207895	Percent Non-Detects	90%
Mean Detects	305.3	SD Detects	456
Median Detects	149.5	CV Detects	1.493
Skewness Detects	2.058	Kurtosis Detects	4.436
Mean of Logged Detects	3.869	SD of Logged Detects	2.96

Normal GOF Test on Detects Only			
Shapiro Wilk Test Statistic	0.732	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.788	Detected Data Not Normal at 5% Significance Leve	
Lilliefors Test Statistic	0.312	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.325	Detected Data appear Normal at 5% Significance Leve	
Detected Data appear Approximate Normal at 5% Significance Leve			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
KM Mean	31.01	KM Standard Error of Mean	22.69
KM SD	160.3	95% KM (BCA) UCL	71.15
95% KM (t) UCL	68.92	95% KM (Percentile Bootstrap) UCL	69.32
95% KM (z) UCL	68.33	95% KM Bootstrap t UCL	136.1
90% KM Chebyshev UCL	99.07	95% KM Chebyshev UCL	129.9
97.5% KM Chebyshev UCL	172.7	99% KM Chebyshev UCL	256.7

Gamma GOF Tests on Detected Observations Only			
A-D Test Statistic	0.276	Anderson-Darling GOF Test	
5% A-D Critical Value	0.757	Detected data appear Gamma Distributed at 5% Significance Leve	
K-S Test Statistic	0.207	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.354	Detected data appear Gamma Distributed at 5% Significance Leve	
Detected data appear Gamma Distributed at 5% Significance Leve			

Gamma Statistics on Detected Data Only			
k hat (MLE)	0.361	k star (bias corrected MLE)	0.292
Theta hat (MLE)	845.2	Theta star (bias corrected MLE)	1047
nu hat (MLE)	4.334	nu star (bias corrected)	3.5
Mean (detects)	305.3		

Gamma ROS Statistics using Imputed Non-Detects			
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs			
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20			
For such situations, GROS method may yield incorrect values of UCLs and BTVs			
This is especially true when the sample size is small.			
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates			
Minimum	0.01	Mean	30.54
Maximum	1200	Median	0.01
SD	161.7	CV	5.295
k hat (MLE)	0.112	k star (bias corrected MLE)	0.117
Theta hat (MLE)	273.7	Theta star (bias corrected MLE)	260.8
nu hat (MLE)	13.39	nu star (bias corrected)	14.05
Adjusted Level of Significance (β)	0.046		
Approximate Chi Square Value (14.05, α)	6.608	Adjusted Chi Square Value (14.05, β)	6.482
95% Gamma Approximate UCL (use when n>=50)	64.95	95% Gamma Adjusted UCL (use when n<50)	66.21

Estimates of Gamma Parameters using KM Estimates			
Mean (KM)	31.01	SD (KM)	160.3
Variance (KM)	25707	SE of Mean (KM)	22.69
k hat (KM)	0.0374	k star (KM)	0.0467
nu hat (KM)	4.49	nu star (KM)	5.598

APPENDIX B-1D2
VOCs and TPH in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH mg/kg

theta hat (KM)	828.9	theta star (KM)	664.7
80% gamma percentile (KM)	3.259	90% gamma percentile (KM)	43.05
95% gamma percentile (KM)	160.6	99% gamma percentile (KM)	693

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (5.60, α)	1.438	Adjusted Chi Square Value (5.60, β)	1.388
95% Gamma Approximate KM-UCL (use when n>=50)	120.7	95% Gamma Adjusted KM-UCL (use when n<50)	125.1

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.884	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.788	Detected Data appear Lognormal at 5% Significance Leve	
Lilliefors Test Statistic	0.264	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.325	Detected Data appear Lognormal at 5% Significance Leve	
Detected Data appear Lognormal at 5% Significance Leve			

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	30.53	Mean in Log Scale	-8.099
SD in Original Scale	161.7	SD in Log Scale	5.121
95% t UCL (assumes normality of ROS data)	65.42	95% Percentile Bootstrap UCL	68.33
95% BCA Bootstrap UCL	105.3	95% Bootstrap t UCL	200.8
95% H-UCL (Log ROS)	60495		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distributior

KM Mean (logged)	-0.597	KM Geo Mean	0.551
KM SD (logged)	1.734	95% Critical H Value (KM-Log)	3.512
KM Standard Error of Mean (logged)	0.248	95% H-UCL (KM -Log)	5.471
KM SD (logged)	1.734	95% Critical H Value (KM-Log)	3.512
KM Standard Error of Mean (logged)	0.248		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	36.81	Mean in Log Scale	-0.487
SD in Original Scale	161.9	SD in Log Scale	2.386
95% t UCL (Assumes normality)	71.74	95% H-Stat UCL	44.88

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Detected Data appear Approximate Normal Distributed at 5% Significance Leve

Suggested UCL to Use

95% KM (t) UCL	68.92

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF tes
When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCI

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
Recommendations are based upon data size, data distribution, and skewness
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician

APPENDIX B-1D2
VOCs and TPH in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH mg/kg

Methyl-tert-butyl ether (MTBE)

General Statistics			
Total Number of Observations	60	Number of Distinct Observations	39
Number of Detects	0	Number of Non-Detects	60
Number of Distinct Detects	0	Number of Distinct Non-Detects	39

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV)

The data set for variable P was not processed!

APPENDIX B-1D2
VOCs and TPH in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH mg/kg

Naphthalene

General Statistics

Total Number of Observations	60	Number of Distinct Observations	41
Number of Detects	6	Number of Non-Detects	54
Number of Distinct Detects	6	Number of Distinct Non-Detects	36
Minimum Detect	1.1	Minimum Non-Detect	0.66
Maximum Detect	7400	Maximum Non-Detect	430
Variance Detects	9802385	Percent Non-Detects	90%
Mean Detects	1940	SD Detects	3131
Median Detects	67.55	CV Detects	1.614
Skewness Detects	1.419	Kurtosis Detects	0.77
Mean of Logged Detects	4.094	SD of Logged Detects	3.871

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.715	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.788	Detected Data Not Normal at 5% Significance Leve	
Lilliefors Test Statistic	0.385	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.325	Detected Data Not Normal at 5% Significance Leve	
Detected Data Not Normal at 5% Significance Leve			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	194.8	KM Standard Error of Mean	152
KM SD	1075	95% KM (BCA) UCL	498.4
95% KM (t) UCL	448.8	95% KM (Percentile Bootstrap) UCL	443.9
95% KM (z) UCL	444.8	95% KM Bootstrap t UCL	8660
90% KM Chebyshev UCL	650.8	95% KM Chebyshev UCL	857.3
97.5% KM Chebyshev UCL	1144	99% KM Chebyshev UCL	1707

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.531	Anderson-Darling GOF Test	
5% A-D Critical Value	0.798	Detected data appear Gamma Distributed at 5% Significance Leve	
K-S Test Statistic	0.274	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.363	Detected data appear Gamma Distributed at 5% Significance Leve	
Detected data appear Gamma Distributed at 5% Significance Leve			

Gamma Statistics on Detected Data Only

k hat (MLE)	0.21	k star (bias corrected MLE)	0.216
Theta hat (MLE)	9234	Theta star (bias corrected MLE)	8974
nu hat (MLE)	2.521	nu star (bias corrected)	2.594
Mean (detects)	1940		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	194
Maximum	7400	Median	0.01
SD	1084	CV	5.588
k hat (MLE)	0.0912	k star (bias corrected MLE)	0.0978
Theta hat (MLE)	2126	Theta star (bias corrected MLE)	1984
nu hat (MLE)	10.95	nu star (bias corrected)	11.73
Adjusted Level of Significance (β)	0.046		
Approximate Chi Square Value (11.73, α)	5.052	Adjusted Chi Square Value (11.73, β)	4.944
95% Gamma Approximate UCL (use when n>=50)	450.5	95% Gamma Adjusted UCL (use when n<50)	460.4

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	194.8	SD (KM)	1075
Variance (KM)	1155202	SE of Mean (KM)	152
k hat (KM)	0.0328	k star (KM)	0.0423
nu hat (KM)	3.941	nu star (KM)	5.077

APPENDIX B-1D2
VOCs and TPH in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH mg/kg

theta hat (KM)	5931	theta star (KM)	4603
80% gamma percentile (KM)	13.74	90% gamma percentile (KM)	232.6
95% gamma percentile (KM)	963.5	99% gamma percentile (KM)	4513

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (5.08, α)	1.188	Adjusted Chi Square Value (5.08, β)	1.143
95% Gamma Approximate KM-UCL (use when n>=50)	832.4	95% Gamma Adjusted KM-UCL (use when n<50)	864.9

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.871	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.788	Detected Data appear Lognormal at 5% Significance Leve	
Lilliefors Test Statistic	0.238	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.325	Detected Data appear Lognormal at 5% Significance Leve	
Detected Data appear Lognormal at 5% Significance Leve			

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	194	Mean in Log Scale	-12.42
SD in Original Scale	1084	SD in Log Scale	6.5
95% t UCL (assumes normality of ROS data)	427.8	95% Percentile Bootstrap UCL	445.2
95% BCA Bootstrap UCL	630	95% Bootstrap t UCL	12582
95% H-UCL (Log ROS)	95904474		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distributior

KM Mean (logged)	0.0527	KM Geo Mean	1.054
KM SD (logged)	1.766	95% Critical H Value (KM-Log)	3.558
KM Standard Error of Mean (logged)	0.252	95% H-UCL (KM -Log)	11.37
KM SD (logged)	1.766	95% Critical H Value (KM-Log)	3.558
KM Standard Error of Mean (logged)	0.252		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	207.9	Mean in Log Scale	0.246
SD in Original Scale	1082	SD in Log Scale	2.471
95% t UCL (Assumes normality)	441.4	95% H-Stat UCL	128.7

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Detected Data appear Gamma Distributed at 5% Significance Leve

Suggested UCL to Use

95% KM Approximate Gamma UCL	832.4

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
Recommendations are based upon data size, data distribution, and skewness
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statisticiar

APPENDIX B-1D2
VOCs and TPH in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH mg/kg

n-Butylbenzene

General Statistics

Total Number of Observations	60	Number of Distinct Observations	38
Number of Detects	6	Number of Non-Detects	54
Number of Distinct Detects	6	Number of Distinct Non-Detects	34
Minimum Detect	0.9	Minimum Non-Detect	0.66
Maximum Detect	3800	Maximum Non-Detect	430
Variance Detects	2197346	Percent Non-Detects	90%
Mean Detects	798.7	SD Detects	1482
Median Detects	265	CV Detects	1.856
Skewness Detects	2.362	Kurtosis Detects	5.662
Mean of Logged Detects	4.24	SD of Logged Detects	3.419

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.611	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.788	Detected Data Not Normal at 5% Significance Leve	
Lilliefors Test Statistic	0.424	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.325	Detected Data Not Normal at 5% Significance Leve	
Detected Data Not Normal at 5% Significance Leve			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	80.77	KM Standard Error of Mean	69.36
KM SD	490.4	95% KM (BCA) UCL	207.4
95% KM (t) UCL	196.7	95% KM (Percentile Bootstrap) UCL	206
95% KM (z) UCL	194.9	95% KM Bootstrap t UCL	669.6
90% KM Chebyshev UCL	288.8	95% KM Chebyshev UCL	383.1
97.5% KM Chebyshev UCL	513.9	99% KM Chebyshev UCL	770.9

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.343	Anderson-Darling GOF Test	
5% A-D Critical Value	0.772	Detected data appear Gamma Distributed at 5% Significance Leve	
K-S Test Statistic	0.211	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.358	Detected data appear Gamma Distributed at 5% Significance Leve	
Detected data appear Gamma Distributed at 5% Significance Leve			

Gamma Statistics on Detected Data Only

k hat (MLE)	0.285	k star (bias corrected MLE)	0.253
Theta hat (MLE)	2806	Theta star (bias corrected MLE)	3151
nu hat (MLE)	3.416	nu star (bias corrected)	3.041
Mean (detects)	798.7		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	79.88
Maximum	3800	Median	0.01
SD	494.6	CV	6.192
k hat (MLE)	0.1	k star (bias corrected MLE)	0.106
Theta hat (MLE)	797	Theta star (bias corrected MLE)	751.3
nu hat (MLE)	12.03	nu star (bias corrected)	12.76
Adjusted Level of Significance (β)	0.046		
Approximate Chi Square Value (12.76, α)	5.731	Adjusted Chi Square Value (12.76, β)	5.614
95% Gamma Approximate UCL (use when n>=50)	177.8	95% Gamma Adjusted UCL (use when n<50)	181.5

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	80.77	SD (KM)	490.4
Variance (KM)	240450	SE of Mean (KM)	69.36
k hat (KM)	0.0271	k star (KM)	0.0369
nu hat (KM)	3.256	nu star (KM)	4.427

APPENDIX B-1D2
VOCs and TPH in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH mg/kg

theta hat (KM)	2977	theta star (KM)	2190
80% gamma percentile (KM)	2.993	90% gamma percentile (KM)	75.25
95% gamma percentile (KM)	368.6	99% gamma percentile (KM)	1961

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (4.43, α)	0.897	Adjusted Chi Square Value (4.43, β)	0.86
95% Gamma Approximate KM-UCL (use when n>=50)	398.6	95% Gamma Adjusted KM-UCL (use when n<50)	415.7

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.865	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.788	Detected Data appear Lognormal at 5% Significance Leve	
Lilliefors Test Statistic	0.263	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.325	Detected Data appear Lognormal at 5% Significance Leve	
Detected Data appear Lognormal at 5% Significance Leve			

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	79.87	Mean in Log Scale	-9.36
SD in Original Scale	494.6	SD in Log Scale	5.435
95% t UCL (assumes normality of ROS data)	186.6	95% Percentile Bootstrap UCL	205.4
95% BCA Bootstrap UCL	280.7	95% Bootstrap t UCL	842.7
95% H-UCL (Log ROS)	207844		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distributior

KM Mean (logged)	0.0629	KM Geo Mean	1.065
KM SD (logged)	1.722	95% Critical H Value (KM-Log)	3.495
KM Standard Error of Mean (logged)	0.246	95% H-UCL (KM -Log)	10.26
KM SD (logged)	1.722	95% Critical H Value (KM-Log)	3.495
KM Standard Error of Mean (logged)	0.246		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	92.44	Mean in Log Scale	0.177
SD in Original Scale	494.3	SD in Log Scale	2.379
95% t UCL (Assumes normality)	199.1	95% H-Stat UCL	84.88

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Detected Data appear Gamma Distributed at 5% Significance Leve

Suggested UCL to Use
95% KM Approximate Gamma UCL 398.6

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
Recommendations are based upon data size, data distribution, and skewness
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statisticiar

APPENDIX B-1D2
VOCs and TPH in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH mg/kg

n-Propylbenzene

General Statistics

Total Number of Observations	60	Number of Distinct Observations	33
Number of Detects	5	Number of Non-Detects	55
Number of Distinct Detects	5	Number of Distinct Non-Detects	28
Minimum Detect	0.66	Minimum Non-Detect	0.33
Maximum Detect	2100	Maximum Non-Detect	210
Variance Detects	733931	Percent Non-Detects	91.67%
Mean Detects	604.1	SD Detects	856.7
Median Detects	310	CV Detects	1.418
Skewness Detects	1.979	Kurtosis Detects	4.072
Mean of Logged Detects	4.791	SD of Logged Detects	3.088

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.751	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.762	Detected Data Not Normal at 5% Significance Leve	
Lilliefors Test Statistic	0.353	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.343	Detected Data Not Normal at 5% Significance Leve	
Detected Data Not Normal at 5% Significance Leve			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	50.76	KM Standard Error of Mean	40
KM SD	277.1	95% KM (BCA) UCL	115.6
95% KM (t) UCL	117.6	95% KM (Percentile Bootstrap) UCL	120.8
95% KM (z) UCL	116.6	95% KM Bootstrap t UCL	222.6
90% KM Chebyshev UCL	170.8	95% KM Chebyshev UCL	225.1
97.5% KM Chebyshev UCL	300.5	99% KM Chebyshev UCL	448.7

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.25	Anderson-Darling GOF Test	
5% A-D Critical Value	0.724	Detected data appear Gamma Distributed at 5% Significance Leve	
K-S Test Statistic	0.196	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.375	Detected data appear Gamma Distributed at 5% Significance Leve	
Detected data appear Gamma Distributed at 5% Significance Leve			

Gamma Statistics on Detected Data Only

k hat (MLE)	0.407	k star (bias corrected MLE)	0.296
Theta hat (MLE)	1485	Theta star (bias corrected MLE)	2041
nu hat (MLE)	4.068	nu star (bias corrected)	2.96
Mean (detects)	604.1		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	50.35
Maximum	2100	Median	0.01
SD	279.5	CV	5.55
k hat (MLE)	0.104	k star (bias corrected MLE)	0.11
Theta hat (MLE)	482.6	Theta star (bias corrected MLE)	456.8
nu hat (MLE)	12.52	nu star (bias corrected)	13.23
Adjusted Level of Significance (β)	0.046		
Approximate Chi Square Value (13.23, α)	6.047	Adjusted Chi Square Value (13.23, β)	5.927
95% Gamma Approximate UCL (use when n>=50)	110.2	95% Gamma Adjusted UCL (use when n<50)	112.4

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	50.76	SD (KM)	277.1
Variance (KM)	76780	SE of Mean (KM)	40
k hat (KM)	0.0336	k star (KM)	0.043
nu hat (KM)	4.027	nu star (KM)	5.159

APPENDIX B-1D2
VOCs and TPH in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH mg/kg

theta hat (KM)	1513	theta star (KM)	1181
80% gamma percentile (KM)	3.833	90% gamma percentile (KM)	62.2
95% gamma percentile (KM)	253.1	99% gamma percentile (KM)	1169

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (5.16, α)	1.226	Adjusted Chi Square Value (5.16, β)	1.181
95% Gamma Approximate KM-UCL (use when n>=50)	213.5	95% Gamma Adjusted KM-UCL (use when n<50)	221.8

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.852	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.762	Detected Data appear Lognormal at 5% Significance Leve	
Lilliefors Test Statistic	0.3	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.343	Detected Data appear Lognormal at 5% Significance Leve	
Detected Data appear Lognormal at 5% Significance Leve			

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	50.35	Mean in Log Scale	-9.594
SD in Original Scale	279.5	SD in Log Scale	5.699
95% t UCL (assumes normality of ROS data)	110.6	95% Percentile Bootstrap UCL	122.3
95% BCA Bootstrap UCL	163.5	95% Bootstrap t UCL	646.5
95% H-UCL (Log ROS)	1585711		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distributior

KM Mean (logged)	-0.61	KM Geo Mean	0.544
KM SD (logged)	1.822	95% Critical H Value (KM-Log)	3.636
KM Standard Error of Mean (logged)	0.264	95% H-UCL (KM -Log)	6.774
KM SD (logged)	1.822	95% Critical H Value (KM-Log)	3.636
KM Standard Error of Mean (logged)	0.264		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	56.63	Mean in Log Scale	-0.496
SD in Original Scale	279.1	SD in Log Scale	2.457
95% t UCL (Assumes normality)	116.9	95% H-Stat UCL	58.22

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Detected Data appear Gamma Distributed at 5% Significance Leve

Suggested UCL to Use
95% KM Approximate Gamma UCL 213.5

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
Recommendations are based upon data size, data distribution, and skewness
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statisticiar

APPENDIX B-1D2
VOCs and TPH in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH mg/kg

sec-Butylbenzene

General Statistics

Total Number of Observations	60	Number of Distinct Observations	38
Number of Detects	4	Number of Non-Detects	56
Number of Distinct Detects	4	Number of Distinct Non-Detects	35
Minimum Detect	110	Minimum Non-Detect	0.66
Maximum Detect	1000	Maximum Non-Detect	210
Variance Detects	163367	Percent Non-Detects	93.33%
Mean Detects	405	SD Detects	404.2
Median Detects	255	CV Detects	0.998
Skewness Detects	1.781	Kurtosis Detects	3.295
Mean of Logged Detects	5.665	SD of Logged Detects	0.927

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.801	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Normal at 5% Significance Leve	
Lilliefors Test Statistic	0.352	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.375	Detected Data appear Normal at 5% Significance Leve	
Detected Data appear Normal at 5% Significance Leve			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	27.72	KM Standard Error of Mean	20.2
KM SD	135.4	95% KM (BCA) UCL	N/A
95% KM (t) UCL	61.47	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	60.94	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	88.31	95% KM Chebyshev UCL	115.8
97.5% KM Chebyshev UCL	153.9	99% KM Chebyshev UCL	228.7

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.347	Anderson-Darling GOF Test	
5% A-D Critical Value	0.662	Detected data appear Gamma Distributed at 5% Significance Leve	
K-S Test Statistic	0.287	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.399	Detected data appear Gamma Distributed at 5% Significance Leve	
Detected data appear Gamma Distributed at 5% Significance Leve			

Gamma Statistics on Detected Data Only

k hat (MLE)	1.621	k star (bias corrected MLE)	0.572
Theta hat (MLE)	249.8	Theta star (bias corrected MLE)	708.1
nu hat (MLE)	12.97	nu star (bias corrected)	4.575
Mean (detects)	405		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	27.01
Maximum	1000	Median	0.01
SD	136.7	CV	5.061
k hat (MLE)	0.111	k star (bias corrected MLE)	0.117
Theta hat (MLE)	243.3	Theta star (bias corrected MLE)	231.7
nu hat (MLE)	13.32	nu star (bias corrected)	13.99
Adjusted Level of Significance (β)	0.046		
Approximate Chi Square Value (13.99, α)	6.565	Adjusted Chi Square Value (13.99, β)	6.439
95% Gamma Approximate UCL (use when n>=50)	57.56	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	27.72	SD (KM)	135.4
Variance (KM)	18347	SE of Mean (KM)	20.2
k hat (KM)	0.0419	k star (KM)	0.0509
nu hat (KM)	5.025	nu star (KM)	6.107

APPENDIX B-1D2
VOCs and TPH in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH mg/kg

theta hat (KM)	661.9	theta star (KM)	544.6
80% gamma percentile (KM)	3.999	90% gamma percentile (KM)	43.28
95% gamma percentile (KM)	148.3	99% gamma percentile (KM)	598.7

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (6.11, α)	1.695	Adjusted Chi Square Value (6.11, β)	1.639
95% Gamma Approximate KM-UCL (use when n>=50)	99.88	95% Gamma Adjusted KM-UCL (use when n<50)	103.3

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.965	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Lognormal at 5% Significance Leve	
Lilliefors Test Statistic	0.233	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.375	Detected Data appear Lognormal at 5% Significance Leve	
Detected Data appear Lognormal at 5% Significance Leve			

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	27.9	Mean in Log Scale	-0.243
SD in Original Scale	136.5	SD in Log Scale	1.975
95% t UCL (assumes normality of ROS data)	57.35	95% Percentile Bootstrap UCL	59.31
95% BCA Bootstrap UCL	77.7	95% Bootstrap t UCL	188
95% H-UCL (Log ROS)	14.86		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distributior

KM Mean (logged)	-0.00543	KM Geo Mean	0.995
KM SD (logged)	1.537	95% Critical H Value (KM-Log)	3.241
KM Standard Error of Mean (logged)	0.23	95% H-UCL (KM -Log)	6.203
KM SD (logged)	1.537	95% Critical H Value (KM-Log)	3.241
KM Standard Error of Mean (logged)	0.23		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	33.47	Mean in Log Scale	0.036
SD in Original Scale	137	SD in Log Scale	2.123
95% t UCL (Assumes normality)	63.03	95% H-Stat UCL	30.73
DL/2 is not a recommended method, provided for comparisons and historical reasons			

Nonparametric Distribution Free UCL Statistics
Detected Data appear Normal Distributed at 5% Significance Leve

Suggested UCL to Use

95% KM (t) UCL	61.47

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
Recommendations are based upon data size, data distribution, and skewness
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statisticiar

APPENDIX B-1D2
VOCs and TPH in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH mg/kg

tert-Butylbenzene

General Statistics			
Total Number of Observations	60	Number of Distinct Observations	39
Number of Detects	0	Number of Non-Detects	60
Number of Distinct Detects	0	Number of Distinct Non-Detects	39

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV)

The data set for variable U was not processed!

APPENDIX B-1D2
VOCs and TPH in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH mg/kg

Tetrachloroethene (PCE)

General Statistics

Total Number of Observations	60	Number of Distinct Observations	34
Number of Detects	3	Number of Non-Detects	57
Number of Distinct Detects	3	Number of Distinct Non-Detects	32
Minimum Detect	0.45	Minimum Non-Detect	0.33
Maximum Detect	2.2	Maximum Non-Detect	600
Variance Detects	0.771	Percent Non-Detects	95%
Mean Detects	1.283	SD Detects	0.878
Median Detects	1.2	CV Detects	0.684
Skewness Detects	0.423	Kurtosis Detects	N/A
Mean of Logged Detects	0.0574	SD of Logged Detects	0.801

Warning: Data set has only 3 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.993	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Normal at 5% Significance Leve	
Lilliefors Test Statistic	0.204	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.425	Detected Data appear Normal at 5% Significance Leve	

Detected Data appear Normal at 5% Significance Leve

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.388	KM Standard Error of Mean	0.0497
KM SD	0.287	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.471	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.47	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.537	95% KM Chebyshev UCL	0.605
97.5% KM Chebyshev UCL	0.698	99% KM Chebyshev UCL	0.882

Gamma GOF Tests on Detected Observations Only
Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	2.759	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.465	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	16.55	nu star (bias corrected)	N/A
Mean (detects)	1.283		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.0737
Maximum	2.2	Median	0.01
SD	0.323	CV	4.387
k hat (MLE)	0.377	k star (bias corrected MLE)	0.369
Theta hat (MLE)	0.196	Theta star (bias corrected MLE)	0.2
nu hat (MLE)	45.2	nu star (bias corrected)	44.28
Adjusted Level of Significance (β)	0.046		
Approximate Chi Square Value (44.28, α)	30.02	Adjusted Chi Square Value (44.28, β)	29.73
95% Gamma Approximate UCL (use when n>=50)	0.109	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.388	SD (KM)	0.287
Variance (KM)	0.0821	SE of Mean (KM)	0.0497
k hat (KM)	1.835	k star (KM)	1.754
nu hat (KM)	220.2	nu star (KM)	210.5

APPENDIX B-1D2
VOCs and TPH in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH mg/kg

theta hat (KM)	0.212	theta star (KM)	0.221
80% gamma percentile (KM)	0.59	90% gamma percentile (KM)	0.779
95% gamma percentile (KM)	0.96	99% gamma percentile (KM)	1.366

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (210.48, α)	177.9	Adjusted Chi Square Value (210.48, β)	177.2
95% Gamma Approximate KM-UCL (use when n>=50)	0.459	95% Gamma Adjusted KM-UCL (use when n<50)	0.461

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.982	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Lognormal at 5% Significance Leve	
Lilliefors Test Statistic	0.229	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.425	Detected Data appear Lognormal at 5% Significance Leve	
Detected Data appear Lognormal at 5% Significance Leve			

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.074	Mean in Log Scale	-4.908
SD in Original Scale	0.323	SD in Log Scale	1.619
95% t UCL (assumes normality of ROS data)	0.144	95% Percentile Bootstrap UCL	0.147
95% BCA Bootstrap UCL	0.188	95% Bootstrap t UCL	0.395
95% H-UCL (Log ROS)	0.0555		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distributior

KM Mean (logged)	-1.036	KM Geo Mean	0.355
KM SD (logged)	0.321	95% Critical H Value (KM-Log)	1.698
KM Standard Error of Mean (logged)	0.0558	95% H-UCL (KM -Log)	0.401
KM SD (logged)	0.321	95% Critical H Value (KM-Log)	1.698
KM Standard Error of Mean (logged)	0.0558		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	14.05	Mean in Log Scale	-0.556
SD in Original Scale	44.97	SD in Log Scale	2.153
95% t UCL (Assumes normality)	23.75	95% H-Stat UCL	18.66

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Detected Data appear Normal Distributed at 5% Significance Leve

Suggested UCL to Use
95% KM (t) UCL 0.471

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
Recommendations are based upon data size, data distribution, and skewness
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statisticiar

APPENDIX B-1D2
VOCs and TPH in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH mg/kg

Toluene

General Statistics

Total Number of Observations	60	Number of Distinct Observations	33
Number of Detects	6	Number of Non-Detects	54
Number of Distinct Detects	6	Number of Distinct Non-Detects	28
Minimum Detect	0.53	Minimum Non-Detect	0.33
Maximum Detect	520	Maximum Non-Detect	600
Variance Detects	44804	Percent Non-Detects	90%
Mean Detects	87.94	SD Detects	211.7
Median Detects	1.75	CV Detects	2.407
Skewness Detects	2.449	Kurtosis Detects	5.999
Mean of Logged Detects	1.163	SD of Logged Detects	2.604

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.501	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.788	Detected Data Not Normal at 5% Significance Leve	
Lilliefors Test Statistic	0.489	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.325	Detected Data Not Normal at 5% Significance Leve	
Detected Data Not Normal at 5% Significance Leve			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	9.256	KM Standard Error of Mean	9.565
KM SD	67.07	95% KM (BCA) UCL	26.82
95% KM (t) UCL	25.24	95% KM (Percentile Bootstrap) UCL	26.9
95% KM (z) UCL	24.99	95% KM Bootstrap t UCL	1542
90% KM Chebyshev UCL	37.95	95% KM Chebyshev UCL	50.95
97.5% KM Chebyshev UCL	68.99	99% KM Chebyshev UCL	104.4

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	1.217	Anderson-Darling GOF Test	
5% A-D Critical Value	0.795	Detected Data Not Gamma Distributed at 5% Significance Leve	
K-S Test Statistic	0.459	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.363	Detected Data Not Gamma Distributed at 5% Significance Leve	
Detected Data Not Gamma Distributed at 5% Significance Leve			

Gamma Statistics on Detected Data Only

k hat (MLE)	0.219	k star (bias corrected MLE)	0.221
Theta hat (MLE)	401.7	Theta star (bias corrected MLE)	398.7
nu hat (MLE)	2.627	nu star (bias corrected)	2.647
Mean (detects)	87.94		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	8.803
Maximum	520	Median	0.01
SD	67.12	CV	7.624
k hat (MLE)	0.127	k star (bias corrected MLE)	0.132
Theta hat (MLE)	69.39	Theta star (bias corrected MLE)	66.87
nu hat (MLE)	15.22	nu star (bias corrected)	15.8
Adjusted Level of Significance (β)	0.046		
Approximate Chi Square Value (15.80, α)	7.819	Adjusted Chi Square Value (15.80, β)	7.68
95% Gamma Approximate UCL (use when n>=50)	17.78	95% Gamma Adjusted UCL (use when n<50)	18.11

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	9.256	SD (KM)	67.07
Variance (KM)	4498	SE of Mean (KM)	9.565
k hat (KM)	0.019	k star (KM)	0.0292
nu hat (KM)	2.286	nu star (KM)	3.505

APPENDIX B-1D2
VOCs and TPH in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH mg/kg

theta hat (KM)	485.9	theta star (KM)	316.9
80% gamma percentile (KM)	0.0876	90% gamma percentile (KM)	5.017
95% gamma percentile (KM)	34.92	99% gamma percentile (KM)	240.7

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (3.50, α)	0.536	Adjusted Chi Square Value (3.50, β)	0.511
95% Gamma Approximate KM-UCL (use when n>=50)	60.47	95% Gamma Adjusted KM-UCL (use when n<50)	63.5

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.734	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.788	Detected Data Not Lognormal at 5% Significance Leve	
Lilliefors Test Statistic	0.343	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.325	Detected Data Not Lognormal at 5% Significance Leve	
Detected Data Not Lognormal at 5% Significance Leve			

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	8.794	Mean in Log Scale	-8.785
SD in Original Scale	67.12	SD in Log Scale	4.255
95% t UCL (assumes normality of ROS data)	23.27	95% Percentile Bootstrap UCL	26.11
95% BCA Bootstrap UCL	43.38	95% Bootstrap t UCL	2947
95% H-UCL (Log ROS)	88.58		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distributior

KM Mean (logged)	-0.86	KM Geo Mean	0.423
KM SD (logged)	1.033	95% Critical H Value (KM-Log)	2.405
KM Standard Error of Mean (logged)	0.149	95% H-UCL (KM -Log)	0.997
KM SD (logged)	1.033	95% Critical H Value (KM-Log)	2.405
KM Standard Error of Mean (logged)	0.149		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	21.11	Mean in Log Scale	-0.478
SD in Original Scale	78.63	SD in Log Scale	2.234
95% t UCL (Assumes normality)	38.07	95% H-Stat UCL	26.43

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Data do not follow a Discernible Distribution at 5% Significance Leve

Suggested UCL to Use

97.5% KM (Chebyshev) UCL	68.99

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
Recommendations are based upon data size, data distribution, and skewness
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statisticiar

APPENDIX B-1D2
VOCs and TPH in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH mg/kg

TPH-Gasoline (C4-C12)

General Statistics

Total Number of Observations	60	Number of Distinct Observations	20
Number of Detects	19	Number of Non-Detects	41
Number of Distinct Detects	17	Number of Distinct Non-Detects	4
Minimum Detect	0.08	Minimum Non-Detect	0.05
Maximum Detect	2400	Maximum Non-Detect	0.1
Variance Detects	296023	Percent Non-Detects	68.33%
Mean Detects	213.6	SD Detects	544.1
Median Detects	39	CV Detects	2.547
Skewness Detects	3.995	Kurtosis Detects	16.69
Mean of Logged Detects	2.089	SD of Logged Detects	3.558

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.418	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.901	Detected Data Not Normal at 5% Significance Leve	
Lilliefors Test Statistic	0.347	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.197	Detected Data Not Normal at 5% Significance Leve	
Detected Data Not Normal at 5% Significance Leve			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	67.67	KM Standard Error of Mean	41.66
KM SD	314.1	95% KM (BCA) UCL	151.1
95% KM (t) UCL	137.3	95% KM (Percentile Bootstrap) UCL	141.2
95% KM (z) UCL	136.2	95% KM Bootstrap t UCL	344.5
90% KM Chebyshev UCL	192.7	95% KM Chebyshev UCL	249.3
97.5% KM Chebyshev UCL	327.9	99% KM Chebyshev UCL	482.2

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.944	Anderson-Darling GOF Test	
5% A-D Critical Value	0.881	Detected Data Not Gamma Distributed at 5% Significance Leve	
K-S Test Statistic	0.249	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.219	Detected Data Not Gamma Distributed at 5% Significance Leve	
Detected Data Not Gamma Distributed at 5% Significance Leve			

Gamma Statistics on Detected Data Only

k hat (MLE)	0.221	k star (bias corrected MLE)	0.221
Theta hat (MLE)	965.6	Theta star (bias corrected MLE)	964.9
nu hat (MLE)	8.405	nu star (bias corrected)	8.412
Mean (detects)	213.6		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	67.64
Maximum	2400	Median	0.01
SD	316.8	CV	4.683
k hat (MLE)	0.119	k star (bias corrected MLE)	0.124
Theta hat (MLE)	570.5	Theta star (bias corrected MLE)	546.6
nu hat (MLE)	14.23	nu star (bias corrected)	14.85
Adjusted Level of Significance (β)	0.046		
Approximate Chi Square Value (14.85, α)	7.157	Adjusted Chi Square Value (14.85, β)	7.025
95% Gamma Approximate UCL (use when n>=50)	140.3	95% Gamma Adjusted UCL (use when n<50)	143

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	67.67	SD (KM)	314.1
Variance (KM)	98673	SE of Mean (KM)	41.66
k hat (KM)	0.0464	k star (KM)	0.0552
nu hat (KM)	5.569	nu star (KM)	6.624

APPENDIX B-1D2
VOCs and TPH in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH mg/kg

theta hat (KM)	1458	theta star (KM)	1226
80% gamma percentile (KM)	12.75	90% gamma percentile (KM)	116.5
95% gamma percentile (KM)	371.4	99% gamma percentile (KM)	1414

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (6.62, α)	1.966	Adjusted Chi Square Value (6.62, β)	1.905
95% Gamma Approximate KM-UCL (use when n>=50)	227.9	95% Gamma Adjusted KM-UCL (use when n<50)	235.3

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.865	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.901	Detected Data Not Lognormal at 5% Significance Leve	
Lilliefors Test Statistic	0.222	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.197	Detected Data Not Lognormal at 5% Significance Leve	
Detected Data Not Lognormal at 5% Significance Leve			

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	67.64	Mean in Log Scale	-5.651
SD in Original Scale	316.8	SD in Log Scale	6.642
95% t UCL (assumes normality of ROS data)	136	95% Percentile Bootstrap UCL	142.7
95% BCA Bootstrap UCL	190.2	95% Bootstrap t UCL	352.4
95% H-UCL (Log ROS)	2.64E+11		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distributior

KM Mean (logged)	-1.385	KM Geo Mean	0.25
KM SD (logged)	3.065	95% Critical H Value (KM-Log)	5.78
KM Standard Error of Mean (logged)	0.407	95% H-UCL (KM -Log)	275.3
KM SD (logged)	3.065	95% Critical H Value (KM-Log)	5.78
KM Standard Error of Mean (logged)	0.407		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	67.65	Mean in Log Scale	-1.772
SD in Original Scale	316.8	SD in Log Scale	3.303
95% t UCL (Assumes normality)	136	95% H-Stat UCL	557.9

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Data do not follow a Discernible Distribution at 5% Significance Leve

Suggested UCL to Use

99% KM (Chebyshev) UCL	482.2

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
Recommendations are based upon data size, data distribution, and skewness
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

APPENDIX B-1D2
VOCs and TPH in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH mg/kg

Trichloroethene (TCE)

General Statistics			
Total Number of Observations	60	Number of Distinct Observations	32
Number of Detects	1	Number of Non-Detects	59
Number of Distinct Detects	1	Number of Distinct Non-Detects	31

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!
It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Y was not processed!

APPENDIX B-1D2
VOCs and TPH in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH mg/kg

Vinyl Chloride

General Statistics

Total Number of Observations	60	Number of Distinct Observations	39
Number of Detects	0	Number of Non-Detects	60
Number of Distinct Detects	0	Number of Distinct Non-Detects	39

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Z was not processed!

APPENDIX B-1D2
VOCs and TPH in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH mg/kg

Xylenes, Total

General Statistics

Total Number of Observations	60	Number of Distinct Observations	31
Number of Detects	4	Number of Non-Detects	56
Number of Distinct Detects	4	Number of Distinct Non-Detects	28
Minimum Detect	1.3	Minimum Non-Detect	0.86
Maximum Detect	7600	Maximum Non-Detect	430
Variance Detects	12988585	Percent Non-Detects	93.33%
Mean Detects	2328	SD Detects	3604
Median Detects	856	CV Detects	1.548
Skewness Detects	1.726	Kurtosis Detects	2.911
Mean of Logged Detects	4.78	SD of Logged Detects	4.083

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.778	Shapiro Wilk GOF Test
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Normal at 5% Significance Leve
Lilliefors Test Statistic	0.319	Lilliefors GOF Test
5% Lilliefors Critical Value	0.375	Detected Data appear Normal at 5% Significance Leve
Detected Data appear Normal at 5% Significance Leve		

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	156.1	KM Standard Error of Mean	148.1
KM SD	993.2	95% KM (BCA) UCL	N/A
95% KM (t) UCL	403.5	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	399.6	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	600.2	95% KM Chebyshev UCL	801.4
97.5% KM Chebyshev UCL	1081	99% KM Chebyshev UCL	1629

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.316	Anderson-Darling GOF Test
5% A-D Critical Value	0.721	Detected data appear Gamma Distributed at 5% Significance Leve
K-S Test Statistic	0.28	Kolmogorov-Smirnov GOF
5% K-S Critical Value	0.422	Detected data appear Gamma Distributed at 5% Significance Leve
Detected data appear Gamma Distributed at 5% Significance Leve		

Gamma Statistics on Detected Data Only

k hat (MLE)	0.24	k star (bias corrected MLE)	0.227
Theta hat (MLE)	9683	Theta star (bias corrected MLE)	10267
nu hat (MLE)	1.924	nu star (bias corrected)	1.814
Mean (detects)	2328		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	155.2
Maximum	7600	Median	0.01
SD	1002	CV	6.453
k hat (MLE)	0.091	k star (bias corrected MLE)	0.0976
Theta hat (MLE)	1705	Theta star (bias corrected MLE)	1590
nu hat (MLE)	10.92	nu star (bias corrected)	11.71
Adjusted Level of Significance (β)	0.046		
Approximate Chi Square Value (11.71, α)	5.038	Adjusted Chi Square Value (11.71, β)	4.93
95% Gamma Approximate UCL (use when n>=50)	360.9	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	156.1	SD (KM)	993.2
Variance (KM)	986483	SE of Mean (KM)	148.1
k hat (KM)	0.0247	k star (KM)	0.0346
nu hat (KM)	2.962	nu star (KM)	4.148

APPENDIX B-1D2
VOCs and TPH in Soil - Zone 4
Surface Soil Samples from 0 - 2 feet below ground surface - micrograms per kilogram (µg/kg); TPH mg/kg

theta hat (KM)	6321	theta star (KM)	4515
80% gamma percentile (KM)	4.099	90% gamma percentile (KM)	127.1
95% gamma percentile (KM)	680.3	99% gamma percentile (KM)	3868

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (4.15, α)	0.781	Adjusted Chi Square Value (4.15, β)	0.747
95% Gamma Approximate KM-UCL (use when n>=50)	828.9	95% Gamma Adjusted KM-UCL (use when n<50)	866.2

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.922	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Lognormal at 5% Significance Leve	
Lilliefors Test Statistic	0.242	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.375	Detected Data appear Lognormal at 5% Significance Leve	
Detected Data appear Lognormal at 5% Significance Leve			

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	155.2	Mean in Log Scale	-17.47
SD in Original Scale	1002	SD in Log Scale	8.224
95% t UCL (assumes normality of ROS data)	371.3	95% Percentile Bootstrap UCL	380.4
95% BCA Bootstrap UCL	592.3	95% Bootstrap t UCL	100395
95% H-UCL (Log ROS)	1.66E+13		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distributior

KM Mean (logged)	0.187	KM Geo Mean	1.205
KM SD (logged)	1.536	95% Critical H Value (KM-Log)	3.239
KM Standard Error of Mean (logged)	0.23	95% H-UCL (KM -Log)	7.498
KM SD (logged)	1.536	95% Critical H Value (KM-Log)	3.239
KM Standard Error of Mean (logged)	0.23		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	170	Mean in Log Scale	0.415
SD in Original Scale	1000	SD in Log Scale	2.313
95% t UCL (Assumes normality)	385.8	95% H-Stat UCL	84.96

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Detected Data appear Normal Distributed at 5% Significance Leve

Suggested UCL to Use

95% KM (t) UCL	403.5

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
Recommendations are based upon data size, data distribution, and skewness
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statisticiar

APPENDIX B-2A
Metals in Groundwater
micrograms per liter (µg/L)

Antimony

General Statistics

Total Number of Observations	131	Number of Distinct Observations	21
Number of Detects	22	Number of Non-Detects	109
Number of Distinct Detects	19	Number of Distinct Non-Detects	2
Minimum Detect	4.3	Minimum Non-Detect	2.7
Maximum Detect	50	Maximum Non-Detect	4.1
Variance Detects	101	Percent Non-Detects	83.21%
Mean Detects	10.09	SD Detects	10.05
Median Detects	6.25	CV Detects	0.997
Skewness Detects	3.321	Kurtosis Detects	12.47
Mean of Logged Detects	2.069	SD of Logged Detects	0.617

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.568	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.911	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.288	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.184	Detected Data Not Normal at 5% Significance Level	
Detected Data Not Normal at 5% Significance Level			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	3.94	KM Standard Error of Mean	0.436
KM SD	4.881	95% KM (BCA) UCL	4.672
95% KM (t) UCL	4.664	95% KM (Percentile Bootstrap) UCL	4.707
95% KM (z) UCL	4.658	95% KM Bootstrap t UCL	5.316
90% KM Chebyshev UCL	5.25	95% KM Chebyshev UCL	5.843
97.5% KM Chebyshev UCL	6.666	99% KM Chebyshev UCL	8.283

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	1.787	Anderson-Darling GOF Test	
5% A-D Critical Value	0.755	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.231	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.188	Detected Data Not Gamma Distributed at 5% Significance Level	
Detected Data Not Gamma Distributed at 5% Significance Level			

Gamma Statistics on Detected Data Only

k hat (MLE)	2.221	k star (bias corrected MLE)	1.948
Theta hat (MLE)	4.542	Theta star (bias corrected MLE)	5.177
nu hat (MLE)	97.71	nu star (bias corrected)	85.72
Mean (detects)	10.09		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	1.702
Maximum	50	Median	0.01
SD	5.534	CV	3.251
k hat (MLE)	0.185	k star (bias corrected MLE)	0.186
Theta hat (MLE)	9.181	Theta star (bias corrected MLE)	9.14
nu hat (MLE)	48.58	nu star (bias corrected)	48.8
Adjusted Level of Significance (β)	0.0482		
Approximate Chi Square Value (48.80, α)	33.76	Adjusted Chi Square Value (48.80, β)	33.62
95% Gamma Approximate UCL (use when n>=50)	2.46	95% Gamma Adjusted UCL (use when n<50)	2.47

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	3.94	SD (KM)	4.881
Variance (KM)	23.82	SE of Mean (KM)	0.436
k hat (KM)	0.652	k star (KM)	0.642
nu hat (KM)	170.8	nu star (KM)	168.2
theta hat (KM)	6.045	theta star (KM)	6.138

APPENDIX B-2A
Metals in Groundwater
micrograms per liter (µg/L)

80% gamma percentile (KM)	6.491	90% gamma percentile (KM)	10.09
95% gamma percentile (KM)	13.84	99% gamma percentile (KM)	22.84

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (168.19, α)	139.2	Adjusted Chi Square Value (168.19, β)	138.9
95% Gamma Approximate KM-UCL (use when n>=50)	4.761	95% Gamma Adjusted KM-UCL (use when n<50)	4.771

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.838	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.911	Detected Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.207	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.184	Detected Data Not Lognormal at 5% Significance Level	

Detected Data Not Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	2.454	Mean in Log Scale	-0.163
SD in Original Scale	5.364	SD in Log Scale	1.472
95% t UCL (assumes normality of ROS data)	3.23	95% Percentile Bootstrap UCL	3.317
95% BCA Bootstrap UCL	3.572	95% Bootstrap t UCL	3.714
95% H-UCL (Log ROS)	3.538		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	1.174	KM Geo Mean	323.50%
KM SD (logged)	0.472	95% Critical H Value (KM-Log)	1.809
KM Standard Error of Mean (logged)	0.0422	95% H-UCL (KM -Log)	3.898
KM SD (logged)	0.472	95% Critical H Value (KM-Log)	1.809
KM Standard Error of Mean (logged)	0.0422		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	3.314	Mean in Log Scale	0.894
SD in Original Scale	5.07	SD in Log Scale	0.601
95% t UCL (Assumes normality)	4.048	95% H-Stat UCL	3.234

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Data do not follow a Discernible Distribution at 5% Significance Level

Suggested UCL to Use

95% KM (Chebyshev) UCL	5.843

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

APPENDIX B-2A
Metals in Groundwater
micrograms per liter (µg/L)

Arsenic

General Statistics

Total Number of Observations	131	Number of Distinct Observations	72
Number of Detects	112	Number of Non-Detects	19
Number of Distinct Detects	71	Number of Distinct Non-Detects	2
Minimum Detect	2.9	Minimum Non-Detect	2.6
Maximum Detect	4300	Maximum Non-Detect	2.9
Variance Detects	167478	Percent Non-Detects	14.50%
Mean Detects	81.54	SD Detects	409.2
Median Detects	16	CV Detects	5.019
Skewness Detects	10.07	Kurtosis Detects	104.3
Mean of Logged Detects	3.055	SD of Logged Detects	1.283

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.176	Normal GOF Test on Detected Observations Only	
5% Shapiro Wilk P Value	0	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.424	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.084	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	70.09	KM Standard Error of Mean	33.15
KM SD	377.7	95% KM (BCA) UCL	135.1
95% KM (t) UCL	125	95% KM (Percentile Bootstrap) UCL	135
95% KM (z) UCL	124.6	95% KM Bootstrap t UCL	379.9
90% KM Chebyshev UCL	169.5	95% KM Chebyshev UCL	214.6
97.5% KM Chebyshev UCL	277.1	99% KM Chebyshev UCL	399.9

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	9.853	Anderson-Darling GOF Test	
5% A-D Critical Value	0.825	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.19	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.0916	Detected Data Not Gamma Distributed at 5% Significance Level	

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.476	k star (bias corrected MLE)	0.469
Theta hat (MLE)	171.4	Theta star (bias corrected MLE)	173.9
nu hat (MLE)	106.6	nu star (bias corrected)	105
Mean (detects)	81.54		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	69.71
Maximum	4300	Median	12
SD	379.3	CV	5.44
k hat (MLE)	0.3	k star (bias corrected MLE)	0.298
Theta hat (MLE)	232.5	Theta star (bias corrected MLE)	233.9
nu hat (MLE)	78.56	nu star (bias corrected)	78.09
Adjusted Level of Significance (β)	0.0482		
Approximate Chi Square Value (78.09, α)	58.73	Adjusted Chi Square Value (78.09, β)	58.55
95% Gamma Approximate UCL (use when n>=50)	92.69	95% Gamma Adjusted UCL (use when n<50)	92.99

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	70.09	SD (KM)	377.7
Variance (KM)	142681	SE of Mean (KM)	33.15
k hat (KM)	0.0344	k star (KM)	0.0387
nu hat (KM)	9.021	nu star (KM)	10.15
theta hat (KM)	2036	theta star (KM)	1810

APPENDIX B-2A
Metals in Groundwater
micrograms per liter (µg/L)

80% gamma percentile (KM)	3.304	90% gamma percentile (KM)	71.69
95% gamma percentile (KM)	329.9	99% gamma percentile (KM)	1675

Gamma Kaplan-Meier (KM) Statistics			
Approximate Chi Square Value (10.15, α)	4.034	Adjusted Chi Square Value (10.15, β)	3.991
95% Gamma Approximate KM-UCL (use when n>=50)	176.3	95% Gamma Adjusted KM-UCL (use when n<50)	178.2

Lognormal GOF Test on Detected Observations Only		
Shapiro Wilk Approximate Test Statistic	0.935	Shapiro Wilk GOF Test
5% Shapiro Wilk P Value	1.74E-05	Detected Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.122	Lilliefors GOF Test
5% Lilliefors Critical Value	0.084	Detected Data Not Lognormal at 5% Significance Level
Detected Data Not Lognormal at 5% Significance Level		

Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	69.91	Mean in Log Scale	2.638
SD in Original Scale	379.2	SD in Log Scale	1.576
95% t UCL (assumes normality of ROS data)	124.8	95% Percentile Bootstrap UCL	135
95% BCA Bootstrap UCL	197.9	95% Bootstrap t UCL	374.3
95% H-UCL (Log ROS)	71.08		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution			
KM Mean (logged)	2.751	KM Geo Mean	15.66
KM SD (logged)	1.393	95% Critical H Value (KM-Log)	2.577
KM Standard Error of Mean (logged)	0.122	95% H-UCL (KM -Log)	56.64
KM SD (logged)	1.39E+00	95% Critical H Value (KM-Log)	2.577
KM Standard Error of Mean (logged)	0.122		

DL/2 Statistics			
DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	69.91	Mean in Log Scale	2.658
SD in Original Scale	379.2	SD in Log Scale	1.531
95% t UCL (Assumes normality)	124.8	95% H-Stat UCL	66.46

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Data do not follow a Discernible Distribution at 5% Significance Level

Suggested UCL to Use
95% KM (Chebyshev) UCL 214.6

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

APPENDIX B-2A
Metals in Groundwater
micrograms per liter (µg/L)

Barium

General Statistics

Total Number of Observations	131	Number of Distinct Observations	71
		Number of Missing Observations	0
Minimum	15	Mean	312.8
Maximum	2400	Median	150
SD	441.9	Std. Error of Mean	38.61
Coefficient of Variation	1.413	Skewness	2.665

Normal GOF Test

Shapiro Wilk Test Statistic	0.618	Shapiro Wilk GOF Test	
5% Shapiro Wilk P Value	0	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.296	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.0778	Data Not Normal at 5% Significance Level	
Data Not Normal at 5% Significance Level			

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	376.8	95% Adjusted-CLT UCL (Chen-1995)	38590.00%
		95% Modified-t UCL (Johnson-1978)	378.3

Gamma GOF Test

A-D Test Statistic	5.847	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.786	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.161	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.0841	Data Not Gamma Distributed at 5% Significance Level	
Data Not Gamma Distributed at 5% Significance Level			

Gamma Statistics

k hat (MLE)	0.936	k star (bias corrected MLE)	0.92
Theta hat (MLE)	334.1	Theta star (bias corrected MLE)	340
nu hat (MLE)	245.3	nu star (bias corrected)	241
MLE Mean (bias corrected)	312.8	MLE Sd (bias corrected)	326.1
		Approximate Chi Square Value (0.05)	206.1
Adjusted Level of Significance	0.0482	Adjusted Chi Square Value	205.7

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	365.8	95% Adjusted Gamma UCL (use when n<50)	366.5

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.95	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk P Value	2.95E-04	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.0842	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.0778	Data Not Lognormal at 5% Significance Level	
Data Not Lognormal at 5% Significance Level			

Lognormal Statistics

Minimum of Logged Data	2.708	Mean of logged Data	5.124
Maximum of Logged Data	7.783	SD of logged Data	1.05

Assuming Lognormal Distribution

95% H-UCL	358.4	90% Chebyshev (MVUE) UCL	387.3
95% Chebyshev (MVUE) UCL	431.5	97.5% Chebyshev (MVUE) UCL	492.8
99% Chebyshev (MVUE) UCL	613.3		

Nonparametric Distribution Free UCL Statistics
Data do not follow a Discernible Distribution (0.05)

Nonparametric Distribution Free UCLs

95% CLT UCL	376.3	95% Jackknife UCL	376.8
95% Standard Bootstrap UCL	376.6	95% Bootstrap-t UCL	394.5
95% Hall's Bootstrap UCL	383.3	95% Percentile Bootstrap UCL	373.9
95% BCA Bootstrap UCL	391.5		

APPENDIX B-2A
Metals in Groundwater
micrograms per liter (µg/L)

90% Chebyshev(Mean, Sd) UCL	428.6	95% Chebyshev(Mean, Sd) UCL	481.1
97.5% Chebyshev(Mean, Sd) UCL	553.9	99% Chebyshev(Mean, Sd) UCL	697

Suggested UCL to Use
95% Chebyshev (Mean, Sd) UCL 481.1

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

APPENDIX B-2A
Metals in Groundwater
micrograms per liter (µg/L)

Beryllium

General Statistics

Total Number of Observations	131	Number of Distinct Observations	15
Number of Detects	18	Number of Non-Detects	113
Number of Distinct Detects	14	Number of Distinct Non-Detects	2
Minimum Detect	0.59	Minimum Non-Detect	0.33
Maximum Detect	4.7	Maximum Non-Detect	0.59
Variance Detects	0.907	Percent Non-Detects	86.26%
Mean Detects	0.946	SD Detects	0.953
Median Detects	0.66	CV Detects	1.007
Skewness Detects	4.022	Kurtosis Detects	16.62
Mean of Logged Detects	-0.239	SD of Logged Detects	0.491

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.386	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.897	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.382	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.202	Detected Data Not Normal at 5% Significance Level	
Detected Data Not Normal at 5% Significance Level			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.415	KM Standard Error of Mean	3.63%
KM SD	0.403	95% KM (BCA) UCL	0.481
95% KM (t) UCL	0.475	95% KM (Percentile Bootstrap) UCL	0.479
95% KM (z) UCL	0.474	95% KM Bootstrap t UCL	0.577
90% KM Chebyshev UCL	0.523	95% KM Chebyshev UCL	0.573
97.5% KM Chebyshev UCL	0.641	99% KM Chebyshev UCL	0.776

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	3.322	Anderson-Darling GOF Test	
5% A-D Critical Value	0.747	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.34	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.205	Detected Data Not Gamma Distributed at 5% Significance Level	
Detected Data Not Gamma Distributed at 5% Significance Level			

Gamma Statistics on Detected Data Only

k hat (MLE)	2.875	k star (bias corrected MLE)	2.433
Theta hat (MLE)	0.329	Theta star (bias corrected MLE)	0.389
nu hat (MLE)	103.5	nu star (bias corrected)	87.59
Mean (detects)	0.946		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.139
Maximum	4.7	Median	0.01
SD	0.472	CV	3.402
k hat (MLE)	0.335	k star (bias corrected MLE)	0.333
Theta hat (MLE)	0.414	Theta star (bias corrected MLE)	0.417
nu hat (MLE)	87.85	nu star (bias corrected)	87.17
Adjusted Level of Significance (β)	0.0482		
Approximate Chi Square Value (87.17, α)	66.64	Adjusted Chi Square Value (87.17, β)	66.45
95% Gamma Approximate UCL (use when n>=50)	0.182	95% Gamma Adjusted UCL (use when n<50)	0.182

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.415	SD (KM)	0.403
Variance (KM)	0.163	SE of Mean (KM)	0.0363
k hat (KM)	1.057	k star (KM)	1.037
nu hat (KM)	276.8	nu star (KM)	271.8
theta hat (KM)	0.392	theta star (KM)	0.4

APPENDIX B-2A
Metals in Groundwater
micrograms per liter (µg/L)

80% gamma percentile (KM)	0.665	90% gamma percentile (KM)	0.946
95% gamma percentile (KM)	1.226	99% gamma percentile (KM)	1.875
Gamma Kaplan-Meier (KM) Statistics			
Approximate Chi Square Value (271.81, α)	234.6	Adjusted Chi Square Value (271.81, β)	234.3
95% Gamma Approximate KM-UCL (use when n>=50)	0.48	95% Gamma Adjusted KM-UCL (use when n<50)	0.481
Lognormal GOF Test on Detected Observations Only			
Shapiro Wilk Test Statistic	0.586	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.897	Detected Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.29	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.202	Detected Data Not Lognormal at 5% Significance Level	
Detected Data Not Lognormal at 5% Significance Level			
Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	0.252	Mean in Log Scale	-1.995
SD in Original Scale	0.454	SD in Log Scale	1.086
95% t UCL (assumes normality of ROS data)	0.318	95% Percentile Bootstrap UCL	0.324
95% BCA Bootstrap UCL	0.353	95% Bootstrap t UCL	0.374
95% H-UCL (Log ROS)	0.304		
Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution			
KM Mean (logged)	-0.989	KM Geo Mean	0.372
KM SD (logged)	0.348	95% Critical H Value (KM-Log)	1.748
KM Standard Error of Mean (logged)	0.0313	95% H-UCL (KM -Log)	0.417
KM SD (logged)	0.348	95% Critical H Value (KM-Log)	1.748
KM Standard Error of Mean (logged)	0.0313		
DL/2 Statistics			
DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.369	Mean in Log Scale	-1.157
SD in Original Scale	0.417	SD in Log Scale	0.45
95% t UCL (Assumes normality)	0.429	95% H-Stat UCL	0.374
DL/2 is not a recommended method, provided for comparisons and historical reasons			
Nonparametric Distribution Free UCL Statistics			
Data do not follow a Discernible Distribution at 5% Significance Level			
Suggested UCL to Use			
95% KM (t) UCL	0.475	KM H-UCL	0.417
95% KM (BCA) UCL	0.481		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

APPENDIX B-2A
Metals in Groundwater
micrograms per liter (µg/L)

Cadmium

General Statistics

Total Number of Observations	131	Number of Distinct Observations	23
Number of Detects	33	Number of Non-Detects	98
Number of Distinct Detects	22	Number of Distinct Non-Detects	2
Minimum Detect	0.21	Minimum Non-Detect	0.21
Maximum Detect	4.1	Maximum Non-Detect	1.3
Variance Detects	0.511	Percent Non-Detects	74.81%
Mean Detects	0.655	SD Detects	0.715
Median Detects	0.42	CV Detects	1.092
Skewness Detects	3.754	Kurtosis Detects	17.25
Mean of Logged Detects	-0.728	SD of Logged Detects	0.716

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.59	Shapiro Wilk GOF Test
5% Shapiro Wilk Critical Value	0.931	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.267	Lilliefors GOF Test
5% Lilliefors Critical Value	0.152	Detected Data Not Normal at 5% Significance Level

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.331	KM Standard Error of Mean	0.0366
KM SD	0.406	95% KM (BCA) UCL	0.396
95% KM (t) UCL	0.392	95% KM (Percentile Bootstrap) UCL	0.395
95% KM (z) UCL	0.391	95% KM Bootstrap t UCL	0.435
90% KM Chebyshev UCL	0.441	95% KM Chebyshev UCL	0.491
97.5% KM Chebyshev UCL	0.56	99% KM Chebyshev UCL	0.696

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	1.394	Anderson-Darling GOF Test
5% A-D Critical Value	0.762	Detected Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.201	Kolmogorov-Smirnov GOF
5% K-S Critical Value	0.156	Detected Data Not Gamma Distributed at 5% Significance Level

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	1.794	k star (bias corrected MLE)	1.651
Theta hat (MLE)	0.365	Theta star (bias corrected MLE)	0.396
nu hat (MLE)	118.4	nu star (bias corrected)	109
Mean (detects)	0.655		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.184
Maximum	4.1	Median	0.01
SD	0.456	CV	2.472
k hat (MLE)	0.364	k star (bias corrected MLE)	0.36
Theta hat (MLE)	0.507	Theta star (bias corrected MLE)	0.512
nu hat (MLE)	95.28	nu star (bias corrected)	94.43
Adjusted Level of Significance (β)	0.0482		
Approximate Chi Square Value (94.43, α)	73.02	Adjusted Chi Square Value (94.43, β)	72.81
95% Gamma Approximate UCL (use when n>=50)	0.239	95% Gamma Adjusted UCL (use when n<50)	0.239

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.331	SD (KM)	0.406
Variance (KM)	0.165	SE of Mean (KM)	0.0366
k hat (KM)	0.664	k star (KM)	0.654
nu hat (KM)	173.9	nu star (KM)	171.3
theta hat (KM)	0.499	theta star (KM)	0.506

APPENDIX B-2A
Metals in Groundwater
micrograms per liter (µg/L)

80% gamma percentile (KM)	0.545	90% gamma percentile (KM)	0.845
95% gamma percentile (KM)	1.155	99% gamma percentile (KM)	1.901

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (171.30, α)	142	Adjusted Chi Square Value (171.30, β)	141.7
95% Gamma Approximate KM-UCL (use when n>=50)	0.399	95% Gamma Adjusted KM-UCL (use when n<50)	0.4

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.911	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.931	Detected Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.152	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.152	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Approximate Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.225	Mean in Log Scale	-2.412
SD in Original Scale	0.441	SD in Log Scale	1.37
95% t UCL (assumes normality of ROS data)	0.289	95% Percentile Bootstrap UCL	0.291
95% BCA Bootstrap UCL	0.33	95% Bootstrap t UCL	0.323
95% H-UCL (Log ROS)	0.312		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-1.328	KM Geo Mean	0.265
KM SD (logged)	0.521	95% Critical H Value (KM-Log)	1.837
KM Standard Error of Mean (logged)	0.0483	95% H-UCL (KM -Log)	0.33
KM SD (logged)	0.521	95% Critical H Value (KM-Log)	1.837
KM Standard Error of Mean (logged)	0.0483		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.31	Mean in Log Scale	-1.647
SD in Original Scale	0.443	SD in Log Scale	0.869
95% t UCL (Assumes normality)	0.374	95% H-Stat UCL	0.329

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Detected Data appear Approximate Lognormal Distributed at 5% Significance Level

Suggested UCL to Use

KM H-UCL	0.33

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

APPENDIX B-2A
Metals in Groundwater
micrograms per liter (µg/L)

Chromium

General Statistics

Total Number of Observations	131	Number of Distinct Observations	43
Number of Detects	88	Number of Non-Detects	43
Number of Distinct Detects	42	Number of Distinct Non-Detects	2
Minimum Detect	0.73	Minimum Non-Detect	0.7
Maximum Detect	380	Maximum Non-Detect	1.5
Variance Detects	1626	Percent Non-Detects	32.82%
Mean Detects	6.841	SD Detects	40.32
Median Detects	1.5	CV Detects	5.894
Skewness Detects	9.319	Kurtosis Detects	87.22
Mean of Logged Detects	0.657	SD of Logged Detects	0.936

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.141	Normal GOF Test on Detected Observations Only	
5% Shapiro Wilk P Value	0	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.457	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.0946	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	4.851	KM Standard Error of Mean	2.898
KM SD	32.98	95% KM (BCA) UCL	10.83
95% KM (t) UCL	9.652	95% KM (Percentile Bootstrap) UCL	10.6
95% KM (z) UCL	9.618	95% KM Bootstrap t UCL	58.58
90% KM Chebyshev UCL	13.55	95% KM Chebyshev UCL	17.48
97.5% KM Chebyshev UCL	22.95	99% KM Chebyshev UCL	33.69

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	15.77	Anderson-Darling GOF Test	
5% A-D Critical Value	0.818	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.32	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.101	Detected Data Not Gamma Distributed at 5% Significance Level	

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.502	k star (bias corrected MLE)	0.492
Theta hat (MLE)	13.64	Theta star (bias corrected MLE)	13.9
nu hat (MLE)	88.28	nu star (bias corrected)	86.6
Mean (detects)	6.841		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	4.599
Maximum	380	Median	1
SD	33.14	CV	7.207
k hat (MLE)	0.27	k star (bias corrected MLE)	0.269
Theta hat (MLE)	17.02	Theta star (bias corrected MLE)	17.09
nu hat (MLE)	70.79	nu star (bias corrected)	70.5
Adjusted Level of Significance (β)	0.0482		
Approximate Chi Square Value (70.50, α)	52.17	Adjusted Chi Square Value (70.50, β)	52
95% Gamma Approximate UCL (use when n>=50)	6.215	95% Gamma Adjusted UCL (use when n<50)	6.235

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	4.851	SD (KM)	32.98
Variance (KM)	1088	SE of Mean (KM)	2.898
k hat (KM)	0.0216	k star (KM)	0.0262
nu hat (KM)	5.666	nu star (KM)	6.87
theta hat (KM)	224.3	theta star (KM)	185

APPENDIX B-2A
Metals in Groundwater
micrograms per liter (µg/L)

80% gamma percentile (KM)	0.0214	90% gamma percentile (KM)	1.928
95% gamma percentile (KM)	16.32	99% gamma percentile (KM)	129.4

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (6.87, α)	2.099	Adjusted Chi Square Value (6.87, β)	2.07
95% Gamma Approximate KM-UCL (use when n>=50)	15.87	95% Gamma Adjusted KM-UCL (use when n<50)	16.1

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Approximate Test Statistic	0.791	Shapiro Wilk GOF Test	
5% Shapiro Wilk P Value	0	Detected Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.178	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.0946	Detected Data Not Lognormal at 5% Significance Level	

Detected Data Not Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	4.737	Mean in Log Scale	0.0828
SD in Original Scale	33.13	SD in Log Scale	1.197
95% t UCL (assumes normality of ROS data)	9.532	95% Percentile Bootstrap UCL	10.45
95% BCA Bootstrap UCL	13.78	95% Bootstrap t UCL	54.07
95% H-UCL (Log ROS)	2.855		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	0.352	KM Geo Mean	1.422
KM SD (logged)	0.885	95% Critical H Value (KM-Log)	2.093
KM Standard Error of Mean (logged)	0.0782	95% H-UCL (KM -Log)	2.476
KM SD (logged)	0.885	95% Critical H Value (KM-Log)	2.093
KM Standard Error of Mean (logged)	0.0782		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	4.759	Mean in Log Scale	0.19
SD in Original Scale	33.12	SD in Log Scale	1.04
95% t UCL (Assumes normality)	9.553	95% H-Stat UCL	2.545

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Data do not follow a Discernible Distribution at 5% Significance Level

Suggested UCL to Use

95% KM (Chebyshev) UCL	17.48

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

APPENDIX B-2A
Metals in Groundwater
micrograms per liter (µg/L)

Chromium, Hexavalent

General Statistics

Total Number of Observations	131	Number of Distinct Observations	500.00%
Number of Detects	4	Number of Non-Detects	127
Number of Distinct Detects	4	Number of Distinct Non-Detects	1
Minimum Detect	5.8	Minimum Non-Detect	3.7
Maximum Detect	48	Maximum Non-Detect	3.7
Variance Detects	361.9	Percent Non-Detects	96.95%
Mean Detects	19.95	SD Detects	19.02
Median Detects	13	CV Detects	0.954
Skewness Detects	1.794	Kurtosis Detects	3.412
Mean of Logged Detects	2.688	SD of Logged Detects	0.877

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.793	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.373	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.375	Detected Data appear Normal at 5% Significance Level	

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	4.196	KM Standard Error of Mean	0.405
KM SD	4.013	95% KM (BCA) UCL	N/A
95% KM (t) UCL	4.867	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	4.862	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	5.411	95% KM Chebyshev UCL	5.961
97.5% KM Chebyshev UCL	6.725	99% KM Chebyshev UCL	8.224

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.39	Anderson-Darling GOF Test	
5% A-D Critical Value	0.661	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.325	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.399	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	1.788	k star (bias corrected MLE)	0.614
Theta hat (MLE)	11.16	Theta star (bias corrected MLE)	32.51
nu hat (MLE)	14.3	nu star (bias corrected)	4.909
Mean (detects)	19.95		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.619
Maximum	48	Median	0.01
SD	4.496	CV	7.265
k hat (MLE)	0.19	k star (bias corrected MLE)	0.191
Theta hat (MLE)	3.256	Theta star (bias corrected MLE)	3.243
nu hat (MLE)	49.8	nu star (bias corrected)	49.99
Adjusted Level of Significance (β)	0.0482		
Approximate Chi Square Value (49.99, α)	34.76	Adjusted Chi Square Value (49.99, β)	34.62
95% Gamma Approximate UCL (use when n>=50)	0.89	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	4.196	SD (KM)	4.013
Variance (KM)	16.1	SE of Mean (KM)	0.405
k hat (KM)	1.093	k star (KM)	1.073
nu hat (KM)	286.5	nu star (KM)	281.2
theta hat (KM)	3.838	theta star (KM)	3.909

APPENDIX B-2A
Metals in Groundwater
micrograms per liter (µg/L)

80% gamma percentile (KM)	6.713	90% gamma percentile (KM)	9.495
95% gamma percentile (KM)	12.26	99% gamma percentile (KM)	18.65

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (281.24, α)	243.4	Adjusted Chi Square Value (281.24, β)	243
95% Gamma Approximate KM-UCL (use when n>=50)	4.849	95% Gamma Adjusted KM-UCL (use when n<50)	4.856

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.946	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.272	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.375	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.729	Mean in Log Scale	-5.453
SD in Original Scale	4.498	SD in Log Scale	3.614
95% t UCL (assumes normality of ROS data)	1.38	95% Percentile Bootstrap UCL	148.90%
95% BCA Bootstrap UCL	2.102	95% Bootstrap t UCL	3.449
95% H-UCL (Log ROS)	15.91		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	1.35	KM Geo Mean	3.859
KM SD (logged)	0.272	95% Critical H Value (KM-Log)	1.718
KM Standard Error of Mean (logged)	0.0274	95% H-UCL (KM -Log)	4.172
KM SD (logged)	0.272	95% Critical H Value (KM-Log)	1.718
KM Standard Error of Mean (logged)	0.0274		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	2.403	Mean in Log Scale	0.678
SD in Original Scale	4.257	SD in Log Scale	0.382
95% t UCL (Assumes normality)	3.019	95% H-Stat UCL	2.249

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Detected Data appear Normal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL	4.867

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

APPENDIX B-2A
Metals in Groundwater
micrograms per liter (µg/L)

Cobalt

General Statistics

Total Number of Observations	131	Number of Distinct Observations	61
Number of Detects	92	Number of Non-Detects	39
Number of Distinct Detects	61	Number of Distinct Non-Detects	2
Minimum Detect	0.68	Minimum Non-Detect	0.68
Maximum Detect	380	Maximum Non-Detect	1.2
Variance Detects	1594	Percent Non-Detects	29.77%
Mean Detects	9.711	SD Detects	39.92
Median Detects	4.15	CV Detects	4.111
Skewness Detects	9.014	Kurtosis Detects	83.88
Mean of Logged Detects	1.356	SD of Logged Detects	0.999

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.19	Normal GOF Test on Detected Observations Only	
5% Shapiro Wilk P Value	0	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.414	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.0926	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	7.025	KM Standard Error of Mean	2.945
KM SD	33.53	95% KM (BCA) UCL	12.77
95% KM (t) UCL	11.9	95% KM (Percentile Bootstrap) UCL	12.36
95% KM (z) UCL	11.87	95% KM Bootstrap t UCL	39.96
90% KM Chebyshev UCL	15.86	95% KM Chebyshev UCL	19.86
97.5% KM Chebyshev UCL	25.42	99% KM Chebyshev UCL	36.33

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	8.393	Anderson-Darling GOF Test	
5% A-D Critical Value	0.802	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.217	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.0975	Detected Data Not Gamma Distributed at 5% Significance Level	

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.664	k star (bias corrected MLE)	0.649
Theta hat (MLE)	14.63	Theta star (bias corrected MLE)	14.95
nu hat (MLE)	122.1	nu star (bias corrected)	119.5
Mean (detects)	9.711		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	6.823
Maximum	380	Median	210.00%
SD	33.7	CV	4.939
k hat (MLE)	0.296	k star (bias corrected MLE)	0.294
Theta hat (MLE)	23.09	Theta star (bias corrected MLE)	23.22
nu hat (MLE)	77.43	nu star (bias corrected)	76.99
Adjusted Level of Significance (β)	0.0482		
Approximate Chi Square Value (76.99, α)	57.78	Adjusted Chi Square Value (76.99, β)	57.59
95% Gamma Approximate UCL (use when n>=50)	9.091	95% Gamma Adjusted UCL (use when n<50)	9.121

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	7.025	SD (KM)	33.53
Variance (KM)	1124	SE of Mean (KM)	2.945
k hat (KM)	0.0439	k star (KM)	0.048
nu hat (KM)	11.5	nu star (KM)	12.57
theta hat (KM)	160	theta star (KM)	146.4

APPENDIX B-2A
Metals in Groundwater
micrograms per liter (µg/L)

80% gamma percentile (KM)	0.821	90% gamma percentile (KM)	10.15
95% gamma percentile (KM)	36.79	99% gamma percentile (KM)	155.3

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (12.57, α)	5.607	Adjusted Chi Square Value (12.57, β)	5.555
95% Gamma Approximate KM-UCL (use when n>=50)	15.75	95% Gamma Adjusted KM-UCL (use when n<50)	15.9

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Approximate Test Statistic	0.934	Shapiro Wilk GOF Test	
5% Shapiro Wilk P Value	1.33E-04	Detected Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.0641	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.0926	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Approximate Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	6.963	Mean in Log Scale	0.684
SD in Original Scale	33.67	SD in Log Scale	1.376
95% t UCL (assumes normality of ROS data)	11.84	95% Percentile Bootstrap UCL	12.69
95% BCA Bootstrap UCL	16.33	95% Bootstrap t UCL	39.11
95% H-UCL (Log ROS)	6.956		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	0.842	KM Geo Mean	2.32
KM SD (logged)	1.148	95% Critical H Value (KM-Log)	2.33
KM Standard Error of Mean (logged)	0.101	95% H-UCL (KM -Log)	5.673
KM SD (logged)	1.148	95% Critical H Value (KM-Log)	2.33
KM Standard Error of Mean (logged)	0.101		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	6.939	Mean in Log Scale	0.67
SD in Original Scale	33.67	SD in Log Scale	1.354
95% t UCL (Assumes normality)	11.81	95% H-Stat UCL	6.609

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Detected Data appear Approximate Lognormal Distributed at 5% Significance Level

Suggested UCL to Use

KM H-UCL	5.673

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

APPENDIX B-2A
Metals in Groundwater
micrograms per liter (µg/L)

Copper

General Statistics

Total Number of Observations	131	Number of Distinct Observations	50
Number of Detects	71	Number of Non-Detects	60
Number of Distinct Detects	49	Number of Distinct Non-Detects	2
Minimum Detect	3.7	Minimum Non-Detect	1.5
Maximum Detect	450	Maximum Non-Detect	3.7
Variance Detects	2834	Percent Non-Detects	45.80%
Mean Detects	17.19	SD Detects	53.24
Median Detects	6.6	CV Detects	3.097
Skewness Detects	7.911	Kurtosis Detects	64.87
Mean of Logged Detects	2.182	SD of Logged Detects	0.813

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.232	Normal GOF Test on Detected Observations Only	
5% Shapiro Wilk P Value	0	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.4	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.105	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	10	KM Standard Error of Mean	3.493
KM SD	39.69	95% KM (BCA) UCL	17.39
95% KM (t) UCL	15.79	95% KM (Percentile Bootstrap) UCL	16.92
95% KM (z) UCL	15.75	95% KM Bootstrap t UCL	34.58
90% KM Chebyshev UCL	20.48	95% KM Chebyshev UCL	25.23
97.5% KM Chebyshev UCL	31.82	99% KM Chebyshev UCL	44.76

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	8.409	Anderson-Darling GOF Test	
5% A-D Critical Value	0.786	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.246	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.109	Detected Data Not Gamma Distributed at 5% Significance Level	

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.885	k star (bias corrected MLE)	0.857
Theta hat (MLE)	19.43	Theta star (bias corrected MLE)	20.07
nu hat (MLE)	125.6	nu star (bias corrected)	121.6
Mean (detects)	17.19		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	9.322
Maximum	450	Median	4.4
SD	40	CV	4.291
k hat (MLE)	0.228	k star (bias corrected MLE)	0.228
Theta hat (MLE)	40.86	Theta star (bias corrected MLE)	40.88
nu hat (MLE)	59.78	nu star (bias corrected)	59.75
Adjusted Level of Significance (β)	0.0482		
Approximate Chi Square Value (59.75, α)	42.97	Adjusted Chi Square Value (59.75, β)	42.81
95% Gamma Approximate UCL (use when n>=50)	12.96	95% Gamma Adjusted UCL (use when n<50)	13.01

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	10	SD (KM)	39.69
Variance (KM)	1576	SE of Mean (KM)	3.493
k hat (KM)	0.0635	k star (KM)	0.0672
nu hat (KM)	16.64	nu star (KM)	17.6
theta hat (KM)	157.5	theta star (KM)	149

APPENDIX B-2A
Metals in Groundwater
micrograms per liter (µg/L)

80% gamma percentile (KM)	3.247	90% gamma percentile (KM)	20.87
95% gamma percentile (KM)	57.23	99% gamma percentile (KM)	192.1

Gamma Kaplan-Meier (KM) Statistics			
Approximate Chi Square Value (17.60, α)	9.099	Adjusted Chi Square Value (17.60, β)	9.031
95% Gamma Approximate KM-UCL (use when n>=50)	19.35	95% Gamma Adjusted KM-UCL (use when n<50)	19.49

Lognormal GOF Test on Detected Observations Only			
Shapiro Wilk Approximate Test Statistic	0.822	Shapiro Wilk GOF Test	
5% Shapiro Wilk P Value	1.16E-11	Detected Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.177	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.105	Detected Data Not Lognormal at 5% Significance Level	
Detected Data Not Lognormal at 5% Significance Level			

Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	9.959	Mean in Log Scale	1.246
SD in Original Scale	39.86	SD in Log Scale	1.273
95% t UCL (assumes normality of ROS data)	15.73	95% Percentile Bootstrap UCL	16.65
95% BCA Bootstrap UCL	23.87	95% Bootstrap t UCL	34.66
95% H-UCL (Log ROS)	10.29		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution			
KM Mean (logged)	1.368	KM Geo Mean	3.929
KM SD (logged)	1.066	95% Critical H Value (KM-Log)	2.253
KM Standard Error of Mean (logged)	0.0938	95% H-UCL (KM -Log)	8.563
KM SD (logged)	1.066	95% Critical H Value (KM-Log)	2.253
KM Standard Error of Mean (logged)	0.0938		

DL/2 Statistics			
DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	10.06	Mean in Log Scale	1.375
SD in Original Scale	39.84	SD in Log Scale	109.40%
95% t UCL (Assumes normality)	15.82	95% H-Stat UCL	8.953

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Data do not follow a Discernible Distribution at 5% Significance Level

Suggested UCL to Use
95% KM (Chebyshev) UCL 25.23

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

APPENDIX B-2A
Metals in Groundwater
micrograms per liter (µg/L)

Lead

General Statistics

Total Number of Observations	131	Number of Distinct Observations	41
Number of Detects	67	Number of Non-Detects	64
Number of Distinct Detects	39	Number of Distinct Non-Detects	2
Minimum Detect	2.7	Minimum Non-Detect	2.2
Maximum Detect	320	Maximum Non-Detect	2.3
Variance Detects	1641	Percent Non-Detects	48.85%
Mean Detects	18.24	SD Detects	40.51
Median Detects	9.6	CV Detects	2.221
Skewness Detects	6.71	Kurtosis Detects	48.65
Mean of Logged Detects	2.433	SD of Logged Detects	0.712

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.292	Normal GOF Test on Detected Observations Only	
5% Shapiro Wilk P Value	0	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.393	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.108	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	10.4	KM Standard Error of Mean	2.628
KM SD	29.85	95% KM (BCA) UCL	15.32
95% KM (t) UCL	14.76	95% KM (Percentile Bootstrap) UCL	14.83
95% KM (z) UCL	14.73	95% KM Bootstrap t UCL	24.93
90% KM Chebyshev UCL	18.29	95% KM Chebyshev UCL	21.86
97.5% KM Chebyshev UCL	26.81	99% KM Chebyshev UCL	36.55

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	8.675	Anderson-Darling GOF Test	
5% A-D Critical Value	0.776	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.288	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.112	Detected Data Not Gamma Distributed at 5% Significance Level	

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	1.201	k star (bias corrected MLE)	1.157
Theta hat (MLE)	15.19	Theta star (bias corrected MLE)	15.77
nu hat (MLE)	160.9	nu star (bias corrected)	155
Mean (detects)	18.24		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	9.335
Maximum	320	Median	3.2
SD	30.28	CV	3.244
k hat (MLE)	0.223	k star (bias corrected MLE)	0.223
Theta hat (MLE)	41.81	Theta star (bias corrected MLE)	41.81
nu hat (MLE)	58.5	nu star (bias corrected)	58.49
Adjusted Level of Significance (β)	0.0482		
Approximate Chi Square Value (58.49, α)	41.91	Adjusted Chi Square Value (58.49, β)	41.75
95% Gamma Approximate UCL (use when n>=50)	13.03	95% Gamma Adjusted UCL (use when n<50)	13.08

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	10.4	SD (KM)	29.85
Variance (KM)	891	SE of Mean (KM)	2.628
k hat (KM)	0.122	k star (KM)	0.124
nu hat (KM)	31.83	nu star (KM)	32.44
theta hat (KM)	85.63	theta star (KM)	8404.00%

APPENDIX B-2A
Metals in Groundwater
micrograms per liter (µg/L)

80% gamma percentile (KM)	9.446	90% gamma percentile (KM)	29.72
95% gamma percentile (KM)	59.13	99% gamma percentile (KM)	148.2

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (32.44, α)	20.42	Adjusted Chi Square Value (32.44, β)	20.31
95% Gamma Approximate KM-UCL (use when n>=50)	16.53	95% Gamma Adjusted KM-UCL (use when n<50)	16.61

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Approximate Test Statistic	0.819	Shapiro Wilk GOF Test	
5% Shapiro Wilk P Value	4.43E-11	Detected Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.191	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.108	Detected Data Not Lognormal at 5% Significance Level	

Detected Data Not Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	10.45	Mean in Log Scale	1.572
SD in Original Scale	29.96	SD in Log Scale	1.108
95% t UCL (assumes normality of ROS data)	14.79	95% Percentile Bootstrap UCL	15.47
95% BCA Bootstrap UCL	18.29	95% Bootstrap t UCL	25.04
95% H-UCL (Log ROS)	11.11		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	1.629	KM Geo Mean	5.101
KM SD (logged)	0.965	95% Critical H Value (KM-Log)	2.161
KM Standard Error of Mean (logged)	0.0849	95% H-UCL (KM -Log)	9.754
KM SD (logged)	0.965	95% Critical H Value (KM-Log)	2.161
KM Standard Error of Mean (logged)	0.0849		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	9.869	Mean in Log Scale	1.293
SD in Original Scale	30.12	SD in Log Scale	1.276
95% t UCL (Assumes normality)	14.23	95% H-Stat UCL	10.82

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Data do not follow a Discernible Distribution at 5% Significance Level

Suggested UCL to Use

95% KM (Chebyshev) UCL	21.86

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

APPENDIX B-2A
Metals in Groundwater
micrograms per liter (µg/L)

Mercury

General Statistics

Total Number of Observations	131	Number of Distinct Observations	9
Number of Detects	9	Number of Non-Detects	122
Number of Distinct Detects	8	Number of Distinct Non-Detects	1
Minimum Detect	0.11	Minimum Non-Detect	0.1
Maximum Detect	0.28	Maximum Non-Detect	0.1
Variance Detects	0.00333	Percent Non-Detects	93.13%
Mean Detects	0.176	SD Detects	0.0577
Median Detects	0.15	CV Detects	0.329
Skewness Detects	0.696	Kurtosis Detects	-0.62
Mean of Logged Detects	-1.786	SD of Logged Detects	0.32

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.918	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.829	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.227	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.274	Detected Data appear Normal at 5% Significance Level	

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.105	KM Standard Error of Mean	0.00221
KM SD	0.0238	95% KM (BCA) UCL	0.109
95% KM (t) UCL	0.109	95% KM (Percentile Bootstrap) UCL	0.109
95% KM (z) UCL	0.109	95% KM Bootstrap t UCL	0.111
90% KM Chebyshev UCL	0.112	95% KM Chebyshev UCL	0.115
97.5% KM Chebyshev UCL	0.119	99% KM Chebyshev UCL	0.127

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.339	Anderson-Darling GOF Test	
5% A-D Critical Value	0.722	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.213	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.279	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	10.98	k star (bias corrected MLE)	7.392
Theta hat (MLE)	0.016	Theta star (bias corrected MLE)	0.0238
nu hat (MLE)	197.6	nu star (bias corrected)	133.1
Mean (detects)	0.176		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.0255
Maximum	0.28	Median	0.01
SD	0.0457	CV	1.792
k hat (MLE)	0.98	k star (bias corrected MLE)	0.963
Theta hat (MLE)	0.026	Theta star (bias corrected MLE)	0.0265
nu hat (MLE)	256.7	nu star (bias corrected)	252.2
Adjusted Level of Significance (β)	0.0482		
Approximate Chi Square Value (252.20, α)	216.4	Adjusted Chi Square Value (252.20, β)	216.1
95% Gamma Approximate UCL (use when n>=50)	0.0297	95% Gamma Adjusted UCL (use when n<50)	0.0298

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.105	SD (KM)	0.0238
Variance (KM)	5.68E-04	SE of Mean (KM)	0.00221
k hat (KM)	19.46	k star (KM)	19.02
nu hat (KM)	5100	nu star (KM)	4984
theta hat (KM)	0.0054	theta star (KM)	0.00553

APPENDIX B-2A
Metals in Groundwater
micrograms per liter (µg/L)

80% gamma percentile (KM)	0.125	90% gamma percentile (KM)	0.137
95% gamma percentile (KM)	0.148	99% gamma percentile (KM)	0.169

Gamma Kaplan-Meier (KM) Statistics			
Approximate Chi Square Value (N/A, α)	4821	Adjusted Chi Square Value (N/A, β)	4819
95% Gamma Approximate KM-UCL (use when n>=50)	0.109	95% Gamma Adjusted KM-UCL (use when n<50)	0.109

Lognormal GOF Test on Detected Observations Only			
Shapiro Wilk Test Statistic	0.944	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.829	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.191	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.274	Detected Data appear Lognormal at 5% Significance Level	
Detected Data appear Lognormal at 5% Significance Level			

Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	0.0395	Mean in Log Scale	-3.724
SD in Original Scale	0.0459	SD in Log Scale	1.004
95% t UCL (assumes normality of ROS data)	0.0461	95% Percentile Bootstrap UCL	0.0465
95% BCA Bootstrap UCL	0.0473	95% Bootstrap t UCL	0.0474
95% H-UCL (Log ROS)	0.0485		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution			
KM Mean (logged)	-2.267	KM Geo Mean	0.104
KM SD (logged)	0.153	95% Critical H Value (KM-Log)	1.681
KM Standard Error of Mean (logged)	0.0142	95% H-UCL (KM -Log)	0.107
KM SD (logged)	0.153	95% Critical H Value (KM-Log)	1.681
KM Standard Error of Mean (logged)	0.0142		

DL/2 Statistics			
DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.0586	Mean in Log Scale	-2.913
SD in Original Scale	0.0349	SD in Log Scale	0.317
95% t UCL (Assumes normality)	0.0637	95% H-Stat UCL	0.06
DL/2 is not a recommended method, provided for comparisons and historical reasons			

Nonparametric Distribution Free UCL Statistics
Detected Data appear Normal Distributed at 5% Significance Level

Suggested UCL to Use
95% KM (t) UCL 0.109

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

APPENDIX B-2A
Metals in Groundwater
micrograms per liter (µg/L)

Molybdenum

General Statistics

Total Number of Observations	131	Number of Distinct Observations	53
Number of Detects	85	Number of Non-Detects	46
Number of Distinct Detects	52	Number of Distinct Non-Detects	2
Minimum Detect	2.9	Minimum Non-Detect	2.3
Maximum Detect	43	Maximum Non-Detect	2.9
Variance Detects	32.17	Percent Non-Detects	35.11%
Mean Detects	7.385	SD Detects	5.672
Median Detects	5.5	CV Detects	0.768
Skewness Detects	3.562	Kurtosis Detects	18.36
Mean of Logged Detects	1.827	SD of Logged Detects	0.543

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.682	Normal GOF Test on Detected Observations Only	
5% Shapiro Wilk P Value	0	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.215	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.0962	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	5.599	KM Standard Error of Mean	0.453
KM SD	5.15	95% KM (BCA) UCL	6.348
95% KM (t) UCL	6.349	95% KM (Percentile Bootstrap) UCL	6.387
95% KM (z) UCL	6.344	95% KM Bootstrap t UCL	6.624
90% KM Chebyshev UCL	6.957	95% KM Chebyshev UCL	7.572
97.5% KM Chebyshev UCL	8.426	99% KM Chebyshev UCL	10.1

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	2.87	Anderson-Darling GOF Test	
5% A-D Critical Value	0.759	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.164	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.0977	Detected Data Not Gamma Distributed at 5% Significance Level	

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	3.048	k star (bias corrected MLE)	2.949
Theta hat (MLE)	2.422	Theta star (bias corrected MLE)	2.504
nu hat (MLE)	518.2	nu star (bias corrected)	501.3
Mean (detects)	7.385		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	4.83
Maximum	43	Median	4
SD	5.741	CV	1.189
k hat (MLE)	0.38	k star (bias corrected MLE)	0.376
Theta hat (MLE)	12.71	Theta star (bias corrected MLE)	12.84
nu hat (MLE)	99.52	nu star (bias corrected)	98.58
Adjusted Level of Significance (β)	0.0482		
Approximate Chi Square Value (98.58, α)	76.67	Adjusted Chi Square Value (98.58, β)	76.46
95% Gamma Approximate UCL (use when n>=50)	6.209	95% Gamma Adjusted UCL (use when n<50)	6.227

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	5.599	SD (KM)	5.15
Variance (KM)	26.52	SE of Mean (KM)	0.453
k hat (KM)	1.182	k star (KM)	1.16
nu hat (KM)	309.7	nu star (KM)	304
theta hat (KM)	4.736	theta star (KM)	4.826

APPENDIX B-2A
Metals in Groundwater
micrograms per liter (µg/L)

80% gamma percentile (KM)	8.895	90% gamma percentile (KM)	12.43
95% gamma percentile (KM)	15.92	99% gamma percentile (KM)	23.95

Gamma Kaplan-Meier (KM) Statistics			
Approximate Chi Square Value (303.97, α)	264.6	Adjusted Chi Square Value (303.97, β)	264.2
95% Gamma Approximate KM-UCL (use when n>=50)	6.433	95% Gamma Adjusted KM-UCL (use when n<50)	6.443

Lognormal GOF Test on Detected Observations Only			
Shapiro Wilk Approximate Test Statistic	0.928	Shapiro Wilk GOF Test	
5% Shapiro Wilk P Value	8.42E-05	Detected Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.125	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.0962	Detected Data Not Lognormal at 5% Significance Level	
Detected Data Not Lognormal at 5% Significance Level			

Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	5.415	Mean in Log Scale	1.363
SD in Original Scale	5.305	SD in Log Scale	0.803
95% t UCL (assumes normality of ROS data)	6.183	95% Percentile Bootstrap UCL	6.235
95% BCA Bootstrap UCL	6.377	95% Bootstrap t UCL	6.415
95% H-UCL (Log ROS)	6.221		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution			
KM Mean (logged)	1.478	KM Geo Mean	4.382
KM SD (logged)	0.643	95% Critical H Value (KM-Log)	1.913
KM Standard Error of Mean (logged)	0.0565	95% H-UCL (KM -Log)	6.004
KM SD (logged)	0.643	95% Critical H Value (KM-Log)	1.913
KM Standard Error of Mean (logged)	0.0565		

DL/2 Statistics			
DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	5.264	Mean in Log Scale	1.287
SD in Original Scale	5.401	SD in Log Scale	0.858
95% t UCL (Assumes normality)	6.046	95% H-Stat UCL	6.117

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Data do not follow a Discernible Distribution at 5% Significance Level

Suggested UCL to Use
95% KM (Chebyshev) UCL 7.572

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

APPENDIX B-2A
Metals in Groundwater
micrograms per liter (µg/L)

Nickel

General Statistics

Total Number of Observations	131	Number of Distinct Observations	66
Number of Detects	97	Number of Non-Detects	34
Number of Distinct Detects	64	Number of Distinct Non-Detects	2
Minimum Detect	1.1	Minimum Non-Detect	0.8
Maximum Detect	420	Maximum Non-Detect	1
Variance Detects	2386	Percent Non-Detects	25.95%
Mean Detects	14.58	SD Detects	48.84
Median Detects	4.8	CV Detects	3.35
Skewness Detects	7.049	Kurtosis Detects	53.85
Mean of Logged Detects	1.644	SD of Logged Detects	1.13

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.269	Normal GOF Test on Detected Observations Only	
5% Shapiro Wilk P Value	0	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.392	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.0902	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	11	KM Standard Error of Mean	3.71
KM SD	42.25	95% KM (BCA) UCL	17.8
95% KM (t) UCL	17.15	95% KM (Percentile Bootstrap) UCL	17.76
95% KM (z) UCL	17.1	95% KM Bootstrap t UCL	37.21
90% KM Chebyshev UCL	22.13	95% KM Chebyshev UCL	27.17
97.5% KM Chebyshev UCL	34.17	99% KM Chebyshev UCL	47.92

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	8.567	Anderson-Darling GOF Test	
5% A-D Critical Value	0.809	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.229	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.0955	Detected Data Not Gamma Distributed at 5% Significance Level	

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.597	k star (bias corrected MLE)	0.586
Theta hat (MLE)	24.41	Theta star (bias corrected MLE)	24.89
nu hat (MLE)	115.9	nu star (bias corrected)	113.6
Mean (detects)	14.58		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	10.8
Maximum	420	Median	2.8
SD	42.46	CV	3.932
k hat (MLE)	0.294	k star (bias corrected MLE)	0.292
Theta hat (MLE)	36.77	Theta star (bias corrected MLE)	36.98
nu hat (MLE)	76.92	nu star (bias corrected)	76.5
Adjusted Level of Significance (β)	0.0482		
Approximate Chi Square Value (76.50, α)	57.35	Adjusted Chi Square Value (76.50, β)	57.17
95% Gamma Approximate UCL (use when n>=50)	14.4	95% Gamma Adjusted UCL (use when n<50)	14.45

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	11	SD (KM)	42.25
Variance (KM)	1785	SE of Mean (KM)	3.71
k hat (KM)	0.0678	k star (KM)	0.0714
nu hat (KM)	17.77	nu star (KM)	18.7
theta hat (KM)	162.2	theta star (KM)	154.2

APPENDIX B-2A
Metals in Groundwater
micrograms per liter (µg/L)

80% gamma percentile (KM)	4.119	90% gamma percentile (KM)	24.1
95% gamma percentile (KM)	63.42	99% gamma percentile (KM)	205.5

Gamma Kaplan-Meier (KM) Statistics			
Approximate Chi Square Value (18.70, α)	9.897	Adjusted Chi Square Value (18.70, β)	9.825
95% Gamma Approximate KM-UCL (use when n>=50)	20.79	95% Gamma Adjusted KM-UCL (use when n<50)	20.94

Lognormal GOF Test on Detected Observations Only		
Shapiro Wilk Approximate Test Statistic	0.917	Shapiro Wilk GOF Test
5% Shapiro Wilk P Value	1.29E-06	Detected Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.0853	Lilliefors GOF Test
5% Lilliefors Critical Value	0.0902	Detected Data appear Lognormal at 5% Significance Level
Detected Data appear Approximate Lognormal at 5% Significance Level		

Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	10.91	Mean in Log Scale	0.971
SD in Original Scale	42.43	SD in Log Scale	1.537
95% t UCL (assumes normality of ROS data)	17.06	95% Percentile Bootstrap UCL	17.6
95% BCA Bootstrap UCL	21.05	95% Bootstrap t UCL	34.94
95% H-UCL (Log ROS)	12.43		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution			
KM Mean (logged)	1.16	KM Geo Mean	3.189
KM SD (logged)	1.268	95% Critical H Value (KM-Log)	2.447
KM Standard Error of Mean (logged)	0.111	95% H-UCL (KM -Log)	9.349
KM SD (logged)	1.268	95% Critical H Value (KM-Log)	2.447
KM Standard Error of Mean (logged)	0.111		

DL/2 Statistics			
DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	10.92	Mean in Log Scale	1.021
SD in Original Scale	42.43	SD in Log Scale	1.437
95% t UCL (Assumes normality)	17.06	95% H-Stat UCL	10.85
DL/2 is not a recommended method, provided for comparisons and historical reasons			

Nonparametric Distribution Free UCL Statistics
Detected Data appear Approximate Lognormal Distributed at 5% Significance Level

Suggested UCL to Use	
KM H-UCL	9.349

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

APPENDIX B-2A
Metals in Groundwater
micrograms per liter (µg/L)

Selenium

General Statistics

Total Number of Observations	131	Number of Distinct Observations	10
Number of Detects	8	Number of Non-Detects	123
Number of Distinct Detects	7	Number of Distinct Non-Detects	3
Minimum Detect	4.9	Minimum Non-Detect	4.6
Maximum Detect	20	Maximum Non-Detect	28
Variance Detects	25.83	Percent Non-Detects	93.89%
Mean Detects	7.588	SD Detects	5.083
Median Detects	5.65	CV Detects	0.67
Skewness Detects	2.685	Kurtosis Detects	7.371
Mean of Logged Detects	1.906	SD of Logged Detects	0.461

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.561	Shapiro Wilk GOF Test
5% Shapiro Wilk Critical Value	0.818	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.405	Lilliefors GOF Test
5% Lilliefors Critical Value	0.283	Detected Data Not Normal at 5% Significance Level

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	4.79	KM Standard Error of Mean	0.13
KM SD	1.383	95% KM (BCA) UCL	5.042
95% KM (t) UCL	5.005	95% KM (Percentile Bootstrap) UCL	5.013
95% KM (z) UCL	5.004	95% KM Bootstrap t UCL	5.552
90% KM Chebyshev UCL	5.18	95% KM Chebyshev UCL	5.356
97.5% KM Chebyshev UCL	5.602	99% KM Chebyshev UCL	6.083

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	1.361	Anderson-Darling GOF Test
5% A-D Critical Value	0.719	Detected Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.354	Kolmogorov-Smirnov GOF
5% K-S Critical Value	0.295	Detected Data Not Gamma Distributed at 5% Significance Level

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	4.322	k star (bias corrected MLE)	2.785
Theta hat (MLE)	1.755	Theta star (bias corrected MLE)	2.725
nu hat (MLE)	69.16	nu star (bias corrected)	44.56
Mean (detects)	7.588		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.522
Maximum	20	Median	0.01
SD	2.177	CV	4.168
k hat (MLE)	0.215	k star (bias corrected MLE)	0.215
Theta hat (MLE)	2.426	Theta star (bias corrected MLE)	2.424
nu hat (MLE)	56.41	nu star (bias corrected)	56.45
Adjusted Level of Significance (β)	0.0482		
Approximate Chi Square Value (56.45, α)	40.18	Adjusted Chi Square Value (56.45, β)	40.03
95% Gamma Approximate UCL (use when n>=50)	0.734	95% Gamma Adjusted UCL (use when n<50)	0.737

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	4.79	SD (KM)	1.383
Variance (KM)	1.913	SE of Mean (KM)	0.13
k hat (KM)	12	k star (KM)	11.73
nu hat (KM)	3143	nu star (KM)	3072
theta hat (KM)	0.399	theta star (KM)	0.408

APPENDIX B-2A
Metals in Groundwater
micrograms per liter (µg/L)

80% gamma percentile (KM)	5.91	90% gamma percentile (KM)	6.647
95% gamma percentile (KM)	7.299	99% gamma percentile (KM)	8.628

Gamma Kaplan-Meier (KM) Statistics			
Approximate Chi Square Value (N/A, α)	2944	Adjusted Chi Square Value (N/A, β)	2943
95% Gamma Approximate KM-UCL (use when n>=50)	4.998	95% Gamma Adjusted KM-UCL (use when n<50)	5

Lognormal GOF Test on Detected Observations Only			
Shapiro Wilk Test Statistic	0.679	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.818	Detected Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.317	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.283	Detected Data Not Lognormal at 5% Significance Level	
Detected Data Not Lognormal at 5% Significance Level			

Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	1.367	Mean in Log Scale	-0.316
SD in Original Scale	2.154	SD in Log Scale	1.114
95% t UCL (assumes normality of ROS data)	1.679	95% Percentile Bootstrap UCL	1.7
95% BCA Bootstrap UCL	1.793	95% Bootstrap t UCL	1.847
95% H-UCL (Log ROS)	1.698		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution			
KM Mean (logged)	1.551	KM Geo Mean	4.714
KM SD (logged)	0.142	95% Critical H Value (KM-Log)	1.678
KM Standard Error of Mean (logged)	0.0134	95% H-UCL (KM -Log)	4.862
KM SD (logged)	0.142	95% Critical H Value (KM-Log)	1.678
KM Standard Error of Mean (logged)	0.0134		

DL/2 Statistics			
DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	2.855	Mean in Log Scale	0.962
SD in Original Scale	2.008	SD in Log Scale	0.335
95% t UCL (Assumes normality)	3.146	95% H-Stat UCL	2.914

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Data do not follow a Discernible Distribution at 5% Significance Level

Suggested UCL to Use			
95% KM (t) UCL	5.005	KM H-UCL	4.862
95% KM (BCA) UCL	5.042		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

APPENDIX B-2A
Metals in Groundwater
micrograms per liter (µg/L)

Silver

General Statistics

Total Number of Observations	131	Number of Distinct Observations	6
Number of Detects	5	Number of Non-Detects	126
Number of Distinct Detects	4	Number of Distinct Non-Detects	3
Minimum Detect	2	Minimum Non-Detect	1.2
Maximum Detect	2.8	Maximum Non-Detect	4.8
Variance Detects	0.082	Percent Non-Detects	96.18%
Mean Detects	2.42	SD Detects	0.286
Median Detects	2.4	CV Detects	0.118
Skewness Detects	-0.332	Kurtosis Detects	1.669
Mean of Logged Detects	0.878	SD of Logged Detects	0.121

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.942	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.762	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.272	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.343	Detected Data appear Normal at 5% Significance Level	

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	1.247	KM Standard Error of Mean	0.0235
KM SD	0.24	95% KM (BCA) UCL	N/A
95% KM (t) UCL	1.286	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	1.286	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	1.318	95% KM Chebyshev UCL	1.349
97.5% KM Chebyshev UCL	1.394	99% KM Chebyshev UCL	1.481

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.348	Anderson-Darling GOF Test	
5% A-D Critical Value	0.678	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.283	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.357	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	86.84	k star (bias corrected MLE)	34.87
Theta hat (MLE)	0.0279	Theta star (bias corrected MLE)	0.0694
nu hat (MLE)	868.4	nu star (bias corrected)	348.7
Mean (detects)	2.42		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.569
Maximum	2.8	Median	0.344
SD	0.654	CV	1.15
k hat (MLE)	0.469	k star (bias corrected MLE)	0.463
Theta hat (MLE)	1.214	Theta star (bias corrected MLE)	1.229
nu hat (MLE)	122.8	nu star (bias corrected)	121.3
Adjusted Level of Significance (β)	0.0482		
Approximate Chi Square Value (121.28, α)	96.85	Adjusted Chi Square Value (121.28, β)	96.61
95% Gamma Approximate UCL (use when n>=50)	0.713	95% Gamma Adjusted UCL (use when n<50)	0.714

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	1.247	SD (KM)	0.24
Variance (KM)	0.0576	SE of Mean (KM)	0.0235
k hat (KM)	27.01	k star (KM)	26.4
nu hat (KM)	7076	nu star (KM)	6916
theta hat (KM)	0.0462	theta star (KM)	0.0472

APPENDIX B-2A
Metals in Groundwater
micrograms per liter (µg/L)

80% gamma percentile (KM)	1.445	90% gamma percentile (KM)	1.566
95% gamma percentile (KM)	1.671	99% gamma percentile (KM)	1.88

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (N/A, α)	6723	Adjusted Chi Square Value (N/A, β)	6721
95% Gamma Approximate KM-UCL (use when n>=50)	1.283	95% Gamma Adjusted KM-UCL (use when n<50)	1.283

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.93	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.762	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.292	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.343	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	1.042	Mean in Log Scale	-0.0472
SD in Original Scale	0.458	SD in Log Scale	0.421
95% t UCL (assumes normality of ROS data)	1.108	95% Percentile Bootstrap UCL	1.107
95% BCA Bootstrap UCL	1.116	95% Bootstrap t UCL	1.113
95% H-UCL (Log ROS)	1.113		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	0.209	KM Geo Mean	1.233
KM SD (logged)	0.135	95% Critical H Value (KM-Log)	1.677
KM Standard Error of Mean (logged)	0.0133	95% H-UCL (KM -Log)	1.269
KM SD (logged)	0.135	95% Critical H Value (KM-Log)	1.677
KM Standard Error of Mean (logged)	0.0133		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	1.019	Mean in Log Scale	-0.0183
SD in Original Scale	0.337	SD in Log Scale	0.256
95% t UCL (Assumes normality)	1.068	95% H-Stat UCL	1.055

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Detected Data appear Normal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL	1.286

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

APPENDIX B-2A
Metals in Groundwater
micrograms per liter (µg/L)

Thallium

General Statistics

Total Number of Observations	100	Number of Distinct Observations	24
Number of Detects	27	Number of Non-Detects	73
Number of Distinct Detects	23	Number of Distinct Non-Detects	2
Minimum Detect	3.5	Minimum Non-Detect	3.5
Maximum Detect	43	Maximum Non-Detect	14
Variance Detects	58.2	Percent Non-Detects	73%
Mean Detects	8.393	SD Detects	7.629
Median Detects	6.5	CV Detects	0.909
Skewness Detects	3.935	Kurtosis Detects	17.37
Mean of Logged Detects	1.943	SD of Logged Detects	0.532

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.527	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.923	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.326	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.167	Detected Data Not Normal at 5% Significance Level	
Detected Data Not Normal at 5% Significance Level			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	4.837	KM Standard Error of Mean	0.455
KM SD	4.459	95% KM (BCA) UCL	5.575
95% KM (t) UCL	5.593	95% KM (Percentile Bootstrap) UCL	5.678
95% KM (z) UCL	5.586	95% KM Bootstrap t UCL	6.442
90% KM Chebyshev UCL	6.202	95% KM Chebyshev UCL	6.821
97.5% KM Chebyshev UCL	7.679	99% KM Chebyshev UCL	9.365

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	1.816	Anderson-Darling GOF Test	
5% A-D Critical Value	0.752	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.223	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.17	Detected Data Not Gamma Distributed at 5% Significance Level	
Detected Data Not Gamma Distributed at 5% Significance Level			

Gamma Statistics on Detected Data Only

k hat (MLE)	2.869	k star (bias corrected MLE)	2.575
Theta hat (MLE)	2.925	Theta star (bias corrected MLE)	3.259
nu hat (MLE)	154.9	nu star (bias corrected)	139.1
Mean (detects)	8.393		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	2.287
Maximum	43	Median	0.01
SD	5.406	CV	2.364
k hat (MLE)	0.206	k star (bias corrected MLE)	0.207
Theta hat (MLE)	11.1	Theta star (bias corrected MLE)	11.07
nu hat (MLE)	41.21	nu star (bias corrected)	41.3
Adjusted Level of Significance (β)	0.0476		
Approximate Chi Square Value (41.30, α)	27.57	Adjusted Chi Square Value (41.30, β)	27.41
95% Gamma Approximate UCL (use when n>=50)	3.425	95% Gamma Adjusted UCL (use when n<50)	3.446

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	4.837	SD (KM)	4.459
Variance (KM)	19.88	SE of Mean (KM)	0.455
k hat (KM)	1.177	k star (KM)	1.148
nu hat (KM)	235.4	nu star (KM)	229.6
theta hat (KM)	4.11	theta star (KM)	4.213

APPENDIX B-2A
Metals in Groundwater
micrograms per liter (µg/L)

80% gamma percentile (KM)	7.691	90% gamma percentile (KM)	10.76
95% gamma percentile (KM)	13.8	99% gamma percentile (KM)	20.8

Gamma Kaplan-Meier (KM) Statistics			
Approximate Chi Square Value (229.64, α)	195.6	Adjusted Chi Square Value (229.64, β)	195.1
95% Gamma Approximate KM-UCL (use when n>=50)	5.68	95% Gamma Adjusted KM-UCL (use when n<50)	5.693

Lognormal GOF Test on Detected Observations Only			
Shapiro Wilk Test Statistic	0.868	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.923	Detected Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.168	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.167	Detected Data Not Lognormal at 5% Significance Level	
Detected Data Not Lognormal at 5% Significance Level			

Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	3.367	Mean in Log Scale	0.659
SD in Original Scale	5.033	SD in Log Scale	1.042
95% t UCL (assumes normality of ROS data)	4.202	95% Percentile Bootstrap UCL	4.235
95% BCA Bootstrap UCL	4.625	95% Bootstrap t UCL	4.73
95% H-UCL (Log ROS)	4.229		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution			
KM Mean (logged)	1.442	KM Geo Mean	4.23
KM SD (logged)	0.411	95% Critical H Value (KM-Log)	1.802
KM Standard Error of Mean (logged)	0.0421	95% H-UCL (KM -Log)	4.957
KM SD (logged)	0.411	95% Critical H Value (KM-Log)	1.802
KM Standard Error of Mean (logged)	0.0421		

DL/2 Statistics			
DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	3.649	Mean in Log Scale	0.961
SD in Original Scale	4.923	SD in Log Scale	0.687
95% t UCL (Assumes normality)	4.466	95% H-Stat UCL	3.805

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Data do not follow a Discernible Distribution at 5% Significance Level

Suggested UCL to Use
95% KM (Chebyshev) UCL 6.821

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

APPENDIX B-2A
Metals in Groundwater
micrograms per liter (µg/L)

Vanadium

General Statistics

Total Number of Observations	131	Number of Distinct Observations	33
Number of Detects	61	Number of Non-Detects	70
Number of Distinct Detects	31	Number of Distinct Non-Detects	2
Minimum Detect	0.88	Minimum Non-Detect	0.7
Maximum Detect	280	Maximum Non-Detect	0.87
Variance Detects	1275	Percent Non-Detects	53.44%
Mean Detects	8.53	SD Detects	35.71
Median Detects	2.2	CV Detects	4.186
Skewness Detects	7.572	Kurtosis Detects	58.39
Mean of Logged Detects	1.024	SD of Logged Detects	1.035

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.204	Normal GOF Test on Detected Observations Only	
5% Shapiro Wilk P Value	0	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.434	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.113	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	4.346	KM Standard Error of Mean	2.156
KM SD	24.48	95% KM (BCA) UCL	9.149
95% KM (t) UCL	7.919	95% KM (Percentile Bootstrap) UCL	8.517
95% KM (z) UCL	7.893	95% KM Bootstrap t UCL	27.81
90% KM Chebyshev UCL	10.82	95% KM Chebyshev UCL	13.75
97.5% KM Chebyshev UCL	17.81	99% KM Chebyshev UCL	25.8

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	8.408	Anderson-Darling GOF Test	
5% A-D Critical Value	0.811	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.302	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.12	Detected Data Not Gamma Distributed at 5% Significance Level	

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.558	k star (bias corrected MLE)	0.541
Theta hat (MLE)	15.29	Theta star (bias corrected MLE)	15.76
nu hat (MLE)	68.05	nu star (bias corrected)	66.03
Mean (detects)	8.53		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	3.978
Maximum	280	Median	0.01
SD	24.63	CV	6.192
k hat (MLE)	0.216	k star (bias corrected MLE)	0.216
Theta hat (MLE)	18.41	Theta star (bias corrected MLE)	18.4
nu hat (MLE)	56.61	nu star (bias corrected)	56.65
Adjusted Level of Significance (β)	0.0482		
Approximate Chi Square Value (56.65, α)	40.35	Adjusted Chi Square Value (56.65, β)	40.2
95% Gamma Approximate UCL (use when n>=50)	5.584	95% Gamma Adjusted UCL (use when n<50)	5.606

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	4.346	SD (KM)	24.48
Variance (KM)	599.2	SE of Mean (KM)	2.156
k hat (KM)	0.0315	k star (KM)	0.0359
nu hat (KM)	8.259	nu star (KM)	9.404
theta hat (KM)	137.9	theta star (KM)	121.1

APPENDIX B-2A
Metals in Groundwater
micrograms per liter (µg/L)

80% gamma percentile (KM)	0.14	90% gamma percentile (KM)	3.831
95% gamma percentile (KM)	19.47	99% gamma percentile (KM)	106.5

Gamma Kaplan-Meier (KM) Statistics			
Approximate Chi Square Value (9.40, α)	3.573	Adjusted Chi Square Value (9.40, β)	3.533
95% Gamma Approximate KM-UCL (use when n>=50)	11.44	95% Gamma Adjusted KM-UCL (use when n<50)	11.57

Lognormal GOF Test on Detected Observations Only			
Shapiro Wilk Approximate Test Statistic	0.84	Shapiro Wilk GOF Test	
5% Shapiro Wilk P Value	9.93E-09	Detected Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.163	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.113	Detected Data Not Lognormal at 5% Significance Level	
Detected Data Not Lognormal at 5% Significance Level			

Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	4.108	Mean in Log Scale	-0.468
SD in Original Scale	24.61	SD in Log Scale	1.733
95% t UCL (assumes normality of ROS data)	7.67	95% Percentile Bootstrap UCL	8.288
95% BCA Bootstrap UCL	12.37	95% Bootstrap t UCL	25.73
95% H-UCL (Log ROS)	4.401		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution			
KM Mean (logged)	0.286	KM Geo Mean	1.331
KM SD (logged)	0.982	95% Critical H Value (KM-Log)	2.177
KM Standard Error of Mean (logged)	0.0865	95% H-UCL (KM -Log)	2.602
KM SD (logged)	0.982	95% Critical H Value (KM-Log)	2.177
KM Standard Error of Mean (logged)	0.0865		

DL/2 Statistics			
DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	4.195	Mean in Log Scale	0.007
SD in Original Scale	24.6	SD in Log Scale	1.186
95% t UCL (Assumes normality)	7.755	95% H-Stat UCL	2.602

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Data do not follow a Discernible Distribution at 5% Significance Level

Suggested UCL to Use
95% KM (Chebyshev) UCL 13.75

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

APPENDIX B-2A
Metals in Groundwater
micrograms per liter (µg/L)

Zinc

General Statistics

Total Number of Observations	131	Number of Distinct Observations	45
Number of Detects	60	Number of Non-Detects	71
Number of Distinct Detects	45	Number of Distinct Non-Detects	2
Minimum Detect	7.4	Minimum Non-Detect	7.4
Maximum Detect	670	Maximum Non-Detect	9.6
Variance Detects	17472	Percent Non-Detects	54.20%
Mean Detects	80.81	SD Detects	132.2
Median Detects	26	CV Detects	1.636
Skewness Detects	2.885	Kurtosis Detects	8.645
Mean of Logged Detects	3.592	SD of Logged Detects	1.176

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.583	Normal GOF Test on Detected Observations Only	
5% Shapiro Wilk P Value	0	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.314	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.114	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	41.03	KM Standard Error of Mean	8.454
KM SD	95.95	95% KM (BCA) UCL	56.61
95% KM (t) UCL	55.03	95% KM (Percentile Bootstrap) UCL	55.86
95% KM (z) UCL	54.93	95% KM Bootstrap t UCL	60.21
90% KM Chebyshev UCL	66.39	95% KM Chebyshev UCL	77.88
97.5% KM Chebyshev UCL	93.82	99% KM Chebyshev UCL	125.1

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	3.59	Anderson-Darling GOF Test	
5% A-D Critical Value	0.792	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.194	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.119	Detected Data Not Gamma Distributed at 5% Significance Level	

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.749	k star (bias corrected MLE)	0.722
Theta hat (MLE)	107.9	Theta star (bias corrected MLE)	111.9
nu hat (MLE)	89.84	nu star (bias corrected)	86.68
Mean (detects)	80.81		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	37.02
Maximum	670	Median	0.01
SD	97.79	CV	2.642
k hat (MLE)	0.169	k star (bias corrected MLE)	0.17
Theta hat (MLE)	218.8	Theta star (bias corrected MLE)	217.2
nu hat (MLE)	44.33	nu star (bias corrected)	44.65
Adjusted Level of Significance (β)	0.0482		
Approximate Chi Square Value (44.65, α)	30.32	Adjusted Chi Square Value (44.65, β)	30.19
95% Gamma Approximate UCL (use when n>=50)	54.51	95% Gamma Adjusted UCL (use when n<50)	54.74

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	41.03	SD (KM)	95.95
Variance (KM)	9207	SE of Mean (KM)	8.454
k hat (KM)	0.183	k star (KM)	0.184
nu hat (KM)	47.9	nu star (KM)	48.13
theta hat (KM)	224.4	theta star (KM)	223.3

APPENDIX B-2A
Metals in Groundwater
micrograms per liter (µg/L)

80% gamma percentile (KM)	51.54	90% gamma percentile (KM)	123.8
95% gamma percentile (KM)	216	99% gamma percentile (KM)	473.2

Gamma Kaplan-Meier (KM) Statistics			
Approximate Chi Square Value (48.13, α)	33.21	Adjusted Chi Square Value (48.13, β)	33.07
95% Gamma Approximate KM-UCL (use when n>=50)	59.46	95% Gamma Adjusted KM-UCL (use when n<50)	59.71

Lognormal GOF Test on Detected Observations Only			
Shapiro Wilk Approximate Test Statistic	0.913	Shapiro Wilk GOF Test	
5% Shapiro Wilk P Value	2.34E-04	Detected Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.138	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.114	Detected Data Not Lognormal at 5% Significance Level	
Detected Data Not Lognormal at 5% Significance Level			

Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	38.25	Mean in Log Scale	1.803
SD in Original Scale	97.34	SD in Log Scale	2.038
95% t UCL (assumes normality of ROS data)	52.34	95% Percentile Bootstrap UCL	52.91
95% BCA Bootstrap UCL	56.83	95% Bootstrap t UCL	59.07
95% H-UCL (Log ROS)	87.48		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution			
KM Mean (logged)	2.731	KM Geo Mean	15.34
KM SD (logged)	1.118	95% Critical H Value (KM-Log)	2.301
KM Standard Error of Mean (logged)	0.0985	95% H-UCL (KM -Log)	35.91
KM SD (logged)	1.118	95% Critical H Value (KM-Log)	2.301
KM Standard Error of Mean (logged)	0.0985		

DL/2 Statistics			
DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	39.13	Mean in Log Scale	2.38
SD in Original Scale	97	SD in Log Scale	1.372
95% t UCL (Assumes normality)	53.17	95% H-Stat UCL	37.7

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Data do not follow a Discernible Distribution at 5% Significance Level

Suggested UCL to Use
95% KM (Chebyshev) UCL 77.88

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

APPENDIX B-2B
VOCs in Groundwater
micrograms per liter (µg/L)

1,1,1,2-Tetrachloroethane

General Statistics

Total Number of Observations	129	Number of Distinct Observations	2
Number of Detects	0	Number of Non-Detects	129
Number of Distinct Detects	0	Number of Distinct Non-Detects	2

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV)

The data set for variable A was not processed!

APPENDIX B-2B
VOCs in Groundwater
micrograms per liter (µg/L)

1,1,1-Trichloroethane

General Statistics

Total Number of Observations	128	Number of Distinct Observations	4
Number of Detects	2	Number of Non-Detects	126
Number of Distinct Detects	2	Number of Distinct Non-Detects	2
Minimum Detect	1.3	Minimum Non-Detect	0.2
Maximum Detect	18	Maximum Non-Detect	0.25
Variance Detects	139.4	Percent Non-Detects	98.44%
Mean Detects	9.65	SD Detects	11.81
Median Detects	9.65	CV Detects	1.224
Skewness Detects	N/A	Kurtosis Detects	N/A
Mean of Logged Detects	1.576	SD of Logged Detects	1.858

Warning: Data set has only 2 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates

Normal GOF Test on Detects Only
Not Enough Data to Perform GOF Test

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.348	KM Standard Error of Mean	0.196
KM SD	1.569	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.673	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.67	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.936	95% KM Chebyshev UCL	1.203
97.5% KM Chebyshev UCL	1.573	99% KM Chebyshev UCL	2.3

Gamma GOF Tests on Detected Observations Only
Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	0.852	k star (bias corrected MLE)	N/A
Theta hat (MLE)	11.32	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	3.409	nu star (bias corrected)	N/A
Mean (detects)	9.65		

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.348	SD (KM)	1.569
Variance (KM)	2.463	SE of Mean (KM)	0.196
k hat (KM)	0.0491	k star (KM)	0.0531
nu hat (KM)	12.56	nu star (KM)	13.6
theta hat (KM)	7.08E+00	theta star (KM)	6.54E+00
80% gamma percentile (KM)	0.058	90% gamma percentile (KM)	0.572
95% gamma percentile (KM)	1.887	99% gamma percentile (KM)	7.38

Gamma Kaplan-Meier (KM) Statistics

		Adjusted Level of Significance (β)	0.0481
Approximate Chi Square Value (13.60, α)	6.299	Adjusted Chi Square Value (13.60, β)	6.243
95% Gamma Approximate KM-UCL (use when n>=50)	0.751	95% Gamma Adjusted KM-UCL (use when n<50)	0.757

Lognormal GOF Test on Detected Observations Only
Not Enough Data to Perform GOF Test

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.151	Mean in Log Scale	-23.91
SD in Original Scale	1.594	SD in Log Scale	10.03
95% t UCL (assumes normality of ROS data)	0.385	95% Percentile Bootstrap UCL	0.432
95% BCA Bootstrap UCL	0.703	95% Bootstrap t UCL	75.85
95% H-UCL (Log ROS)	N/A		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distributior

APPENDIX B-2B
VOCs in Groundwater
micrograms per liter (µg/L)

KM Mean (logged)	-1.56	KM Geo Mean	0.21
KM SD (logged)	0.428	95% Critical H Value (KM-Log)	1.785
KM Standard Error of Mean (logged)	0.0535	95% H-UCL (KM -Log)	0.247
KM SD (logged)	0.428	95% Critical H Value (KM-Log)	1.785
KM Standard Error of Mean (logged)	0.0535		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.271	Mean in Log Scale	-2.05
SD in Original Scale	1.583	SD in Log Scale	0.493
95% t UCL (Assumes normality)	0.503	95% H-Stat UCL	0.157

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Data do not follow a Discernible Distribution at 5% Significance Leve

Suggested UCL to Use
95% KM (Chebyshev) UCL 1.203

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
Recommendations are based upon data size, data distribution, and skewness
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statisticiar

APPENDIX B-2B
VOCs in Groundwater
micrograms per liter (µg/L)

1,1,2,2-Tetrachloroethane

General Statistics

Total Number of Observations	128	Number of Distinct Observations	2
Number of Detects	0	Number of Non-Detects	128
Number of Distinct Detects	0	Number of Distinct Non-Detects	2

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV)

The data set for variable C was not processed!

APPENDIX B-2B
VOCs in Groundwater
micrograms per liter (µg/L)

1,1,2-Trichloro-1,2,2-trifluoroethane

General Statistics

Total Number of Observations	128	Number of Distinct Observations	3
Number of Detects	1	Number of Non-Detects	127
Number of Distinct Detects	1	Number of Distinct Non-Detects	2

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set
It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV)

The data set for variable D was not processed!

APPENDIX B-2B
VOCs in Groundwater
micrograms per liter (µg/L)

1,1,2-Trichloroethane

General Statistics

Total Number of Observations	128	Number of Distinct Observations	2
Number of Detects	0	Number of Non-Detects	128
Number of Distinct Detects	0	Number of Distinct Non-Detects	2

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV)

The data set for variable E was not processed!

APPENDIX B-2B
VOCs in Groundwater
micrograms per liter (µg/L)

1,1-Dichloroethane

General Statistics

Total Number of Observations	129	Number of Distinct Observations	6
Number of Detects	4	Number of Non-Detects	125
Number of Distinct Detects	4	Number of Distinct Non-Detects	2
Minimum Detect	0.26	Minimum Non-Detect	0.11
Maximum Detect	52	Maximum Non-Detect	0.25
Variance Detects	623.2	Percent Non-Detects	96.90%
Mean Detects	14.69	SD Detects	24.96
Median Detects	3.25	CV Detects	1.699
Skewness Detects	1.957	Kurtosis Detects	3.849
Mean of Logged Detects	1.129	SD of Logged Detects	2.245

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.701	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.748	Detected Data Not Normal at 5% Significance Leve	
Lilliefors Test Statistic	0.398	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.375	Detected Data Not Normal at 5% Significance Leve	
Detected Data Not Normal at 5% Significance Leve			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.562	KM Standard Error of Mean	0.465
KM SD	4.569	95% KM (BCA) UCL	N/A
95% KM (t) UCL	1.332	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	1.326	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	1.956	95% KM Chebyshev UCL	2.587
97.5% KM Chebyshev UCL	3.463	99% KM Chebyshev UCL	5.184

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.32	Anderson-Darling GOF Test	
5% A-D Critical Value	0.69	Detected data appear Gamma Distributed at 5% Significance Leve	
K-S Test Statistic	0.264	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.413	Detected data appear Gamma Distributed at 5% Significance Leve	
Detected data appear Gamma Distributed at 5% Significance Leve			

Gamma Statistics on Detected Data Only

k hat (MLE)	0.419	k star (bias corrected MLE)	0.271
Theta hat (MLE)	35.05	Theta star (bias corrected MLE)	54.12
nu hat (MLE)	3.353	nu star (bias corrected)	2.172
Mean (detects)	14.69		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.465
Maximum	52	Median	0.01
SD	4.597	CV	9.882
k hat (MLE)	0.201	k star (bias corrected MLE)	0.201
Theta hat (MLE)	2.316	Theta star (bias corrected MLE)	2.311
nu hat (MLE)	51.81	nu star (bias corrected)	51.94
Adjusted Level of Significance (β)	0.0481		
Approximate Chi Square Value (51.94, α)	36.39	Adjusted Chi Square Value (51.94, β)	36.24
95% Gamma Approximate UCL (use when n>=50)	0.664	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.562	SD (KM)	4.569
Variance (KM)	20.88	SE of Mean (KM)	0.465
k hat (KM)	0.0151	k star (KM)	0.0199
nu hat (KM)	3.904	nu star (KM)	5.146

APPENDIX B-2B
VOCs in Groundwater
micrograms per liter (µg/L)

theta hat (KM)	37.15	theta star (KM)	28.18
80% gamma percentile (KM)	2.23E-04	90% gamma percentile (KM)	0.082
95% gamma percentile (KM)	1.285	99% gamma percentile (KM)	15.71
Gamma Kaplan-Meier (KM) Statistics			
Approximate Chi Square Value (5.15, α)	1.22	Adjusted Chi Square Value (5.15, β)	1.199
95% Gamma Approximate KM-UCL (use when n>=50)	2.37	95% Gamma Adjusted KM-UCL (use when n<50)	2.412
Lognormal GOF Test on Detected Observations Only			
Shapiro Wilk Test Statistic	0.993	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Lognormal at 5% Significance Leve	
Lilliefors Test Statistic	0.158	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.375	Detected Data appear Lognormal at 5% Significance Leve	
Detected Data appear Lognormal at 5% Significance Leve			
Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	0.456	Mean in Log Scale	-19.99
SD in Original Scale	4.598	SD in Log Scale	9.279
95% t UCL (assumes normality of ROS data)	1.127	95% Percentile Bootstrap UCL	1.253
95% BCA Bootstrap UCL	2.077	95% Bootstrap t UCL	18.37
95% H-UCL (Log ROS)	4.71E+14		
Statistics using KM estimates on Logged Data and Assuming Lognormal Distributior			
KM Mean (logged)	-2.104	KM Geo Mean	0.122
KM SD (logged)	0.672	95% Critical H Value (KM-Log)	1.931
KM Standard Error of Mean (logged)	0.0683	95% H-UCL (KM -Log)	0.171
KM SD (logged)	0.672	95% Critical H Value (KM-Log)	1.931
KM Standard Error of Mean (logged)	0.0683		
DL/2 Statistics			
DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.568	Mean in Log Scale	-2.082
SD in Original Scale	4.587	SD in Log Scale	0.724
95% t UCL (Assumes normality)	1.237	95% H-Stat UCL	0.184
DL/2 is not a recommended method, provided for comparisons and historical reasons			
Nonparametric Distribution Free UCL Statistics			
Detected Data appear Gamma Distributed at 5% Significance Leve			
Suggested UCL to Use			
95% KM Approximate Gamma UCL	2.37		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
Recommendations are based upon data size, data distribution, and skewness
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statisticiar

APPENDIX B-2B
VOCs in Groundwater
micrograms per liter (µg/L)

1,1-Dichloroethene

General Statistics

Total Number of Observations	130	Number of Distinct Observations	3
Number of Detects	1	Number of Non-Detects	129
Number of Distinct Detects	1	Number of Distinct Non-Detects	2

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set
It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV)

The data set for variable G was not processed!

APPENDIX B-2B
VOCs in Groundwater
micrograms per liter (µg/L)

1,1-Dichloropropene

General Statistics

Total Number of Observations	129	Number of Distinct Observations	2
Number of Detects	0	Number of Non-Detects	129
Number of Distinct Detects	0	Number of Distinct Non-Detects	2

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV)

The data set for variable H was not processed!

APPENDIX B-2B
VOCs in Groundwater
micrograms per liter (µg/L)

1,2,3-Trichlorobenzene

General Statistics

Total Number of Observations	128	Number of Distinct Observations	3
Number of Detects	1	Number of Non-Detects	12700.00%
Number of Distinct Detects	1	Number of Distinct Non-Detects	2

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set
It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV)

The data set for variable I was not processed!

APPENDIX B-2B
VOCs in Groundwater
micrograms per liter (µg/L)

1,2,3-Trichloropropane

General Statistics

Total Number of Observations	128	Number of Distinct Observations	2
Number of Detects	0	Number of Non-Detects	128
Number of Distinct Detects	0	Number of Distinct Non-Detects	2

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV)

The data set for variable J was not processed!

APPENDIX B-2B
VOCs in Groundwater
micrograms per liter (µg/L)

1,2,4-Trichlorobenzene

General Statistics

Total Number of Observations	128	Number of Distinct Observations	2
Number of Detects	0	Number of Non-Detects	128
Number of Distinct Detects	0	Number of Distinct Non-Detects	2

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV)

The data set for variable K was not processed!

APPENDIX B-2B
VOCs in Groundwater
micrograms per liter (µg/L)

1,2,4-Trimethylbenzene

General Statistics

Total Number of Observations	128	Number of Distinct Observations	9
Number of Detects	8	Number of Non-Detects	120
Number of Distinct Detects	8	Number of Distinct Non-Detects	2
Minimum Detect	0.25	Minimum Non-Detect	0.2
Maximum Detect	4.9	Maximum Non-Detect	0.25
Variance Detects	3.337	Percent Non-Detects	93.75%
Mean Detects	1.616	SD Detects	1.827
Median Detects	0.74	CV Detects	1.13
Skewness Detects	1.264	Kurtosis Detects	0.00617
Mean of Logged Detects	-0.113	SD of Logged Detects	1.175

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.77	Shapiro Wilk GOF Test
5% Shapiro Wilk Critical Value	0.818	Detected Data Not Normal at 5% Significance Leve
Lilliefors Test Statistic	0.292	Lilliefors GOF Test
5% Lilliefors Critical Value	0.283	Detected Data Not Normal at 5% Significance Leve
Detected Data Not Normal at 5% Significance Leve		

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.289	KM Standard Error of Mean	0.0518
KM SD	0.548	95% KM (BCA) UCL	0.392
95% KM (t) UCL	0.374	95% KM (Percentile Bootstrap) UCL	0.376
95% KM (z) UCL	0.374	95% KM Bootstrap t UCL	0.577
90% KM Chebyshev UCL	0.444	95% KM Chebyshev UCL	0.514
97.5% KM Chebyshev UCL	0.612	99% KM Chebyshev UCL	0.803

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.522	Anderson-Darling GOF Test
5% A-D Critical Value	0.736	Detected data appear Gamma Distributed at 5% Significance Leve
K-S Test Statistic	0.219	Kolmogorov-Smirnov GOF
5% K-S Critical Value	0.302	Detected data appear Gamma Distributed at 5% Significance Leve
Detected data appear Gamma Distributed at 5% Significance Leve		

Gamma Statistics on Detected Data Only

k hat (MLE)	0.976	k star (bias corrected MLE)	0.693
Theta hat (MLE)	1.657	Theta star (bias corrected MLE)	2.332
nu hat (MLE)	15.61	nu star (bias corrected)	11.09
Mean (detects)	1.616		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.11
Maximum	4.9	Median	0.01
SD	0.58	CV	5.253
k hat (MLE)	0.322	k star (bias corrected MLE)	0.319
Theta hat (MLE)	0.343	Theta star (bias corrected MLE)	0.346
nu hat (MLE)	82.31	nu star (bias corrected)	81.71
Adjusted Level of Significance (β)	0.0481		
Approximate Chi Square Value (81.71, α)	61.88	Adjusted Chi Square Value (81.71, β)	61.68
95% Gamma Approximate UCL (use when n>=50)	0.146	95% Gamma Adjusted UCL (use when n<50)	0.146

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.289	SD (KM)	0.548
Variance (KM)	0.3	SE of Mean (KM)	0.0518
k hat (KM)	0.277	k star (KM)	0.276
nu hat (KM)	71.03	nu star (KM)	70.7

APPENDIX B-2B
VOCs in Groundwater
micrograms per liter (µg/L)

theta hat (KM)	1.04	theta star (KM)	1.045
80% gamma percentile (KM)	0.433	90% gamma percentile (KM)	0.859
95% gamma percentile (KM)	1.355	99% gamma percentile (KM)	2.658

Gamma Kaplan-Meier (KM) Statistics			
Approximate Chi Square Value (70.70, α)	52.34	Adjusted Chi Square Value (70.70, β)	52.16
95% Gamma Approximate KM-UCL (use when n>=50)	0.39	95% Gamma Adjusted KM-UCL (use when n<50)	0.391

Lognormal GOF Test on Detected Observations Only			
Shapiro Wilk Test Statistic	0.894	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.818	Detected Data appear Lognormal at 5% Significance Leve	
Lilliefors Test Statistic	0.191	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.283	Detected Data appear Lognormal at 5% Significance Leve	
Detected Data appear Lognormal at 5% Significance Leve			

Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	0.109	Mean in Log Scale	-7.6
SD in Original Scale	0.581	SD in Log Scale	3.76
95% t UCL (assumes normality of ROS data)	0.194	95% Percentile Bootstrap UCL	0.199
95% BCA Bootstrap UCL	0.241	95% Bootstrap t UCL	0.399
95% H-UCL (Log ROS)	3.691		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distributior			
KM Mean (logged)	-1.516	KM Geo Mean	0.22
KM SD (logged)	0.455	95% Critical H Value (KM-Log)	1.799
KM Standard Error of Mean (logged)	0.043	95% H-UCL (KM -Log)	0.262
KM SD (logged)	0.455	95% Critical H Value (KM-Log)	1.799
KM Standard Error of Mean (logged)	0.043		

DL/2 Statistics			
DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.215	Mean in Log Scale	-1.984
SD in Original Scale	0.562	SD in Log Scale	0.563
95% t UCL (Assumes normality)	0.297	95% H-Stat UCL	0.177
DL/2 is not a recommended method, provided for comparisons and historical reasons			

Nonparametric Distribution Free UCL Statistics	
Detected Data appear Gamma Distributed at 5% Significance Leve	
Suggested UCL to Use	
95% KM Approximate Gamma UCL	0.39

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
Recommendations are based upon data size, data distribution, and skewness
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statisticiar

APPENDIX B-2B
VOCs in Groundwater
micrograms per liter (µg/L)

1,2-Dibromo-3-chloropropane

General Statistics

Total Number of Observations	128	Number of Distinct Observations	2
Number of Detects	0	Number of Non-Detects	128
Number of Distinct Detects	0	Number of Distinct Non-Detects	2

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV)

The data set for variable M was not processed!

APPENDIX B-2B
VOCs in Groundwater
micrograms per liter (µg/L)

1,2-Dibromoethane

General Statistics

Total Number of Observations	129	Number of Distinct Observations	2
Number of Detects	0	Number of Non-Detects	129
Number of Distinct Detects	0	Number of Distinct Non-Detects	2

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV)

The data set for variable N was not processed!

APPENDIX B-2B
VOCs in Groundwater
micrograms per liter (µg/L)

1,2-Dichlorobenzene

General Statistics

Total Number of Observations	128	Number of Distinct Observations	2
Number of Detects	1	Number of Non-Detects	127
Number of Distinct Detects	1	Number of Distinct Non-Detects	2

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set
It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV)

The data set for variable O was not processed!

APPENDIX B-2B
VOCs in Groundwater
micrograms per liter (µg/L)

1,2-Dichloroethane

General Statistics

Total Number of Observations	128	Number of Distinct Observations	2
Number of Detects	0	Number of Non-Detects	128
Number of Distinct Detects	0	Number of Distinct Non-Detects	2

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV)

The data set for variable P was not processed!

APPENDIX B-2B
VOCs in Groundwater
micrograms per liter (µg/L)

1,2-Dichloropropane

General Statistics

Total Number of Observations	128	Number of Distinct Observations	2
Number of Detects	0	Number of Non-Detects	128
Number of Distinct Detects	0	Number of Distinct Non-Detects	2

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV)

The data set for variable Q was not processed!

APPENDIX B-2B
VOCs in Groundwater
micrograms per liter (µg/L)

1,3,5-Trimethylbenzene

General Statistics

Total Number of Observations	129	Number of Distinct Observations	6
Number of Detects	4	Number of Non-Detects	125
Number of Distinct Detects	4	Number of Distinct Non-Detects	2
Minimum Detect	0.44	Minimum Non-Detect	0.17
Maximum Detect	1.2	Maximum Non-Detect	0.25
Variance Detects	0.104	Percent Non-Detects	96.90%
Mean Detects	0.875	SD Detects	0.322
Median Detects	0.93	CV Detects	0.368
Skewness Detects	-0.921	Kurtosis Detects	1.17
Mean of Logged Detects	-0.197	SD of Logged Detects	0.437

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.959	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Normal at 5% Significance Leve	
Lilliefors Test Statistic	0.231	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.375	Detected Data appear Normal at 5% Significance Leve	
Detected Data appear Normal at 5% Significance Leve			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.192	KM Standard Error of Mean	0.0134
KM SD	0.132	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.214	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.214	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.232	95% KM Chebyshev UCL	0.25
97.5% KM Chebyshev UCL	0.275	99% KM Chebyshev UCL	0.325

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.349	Anderson-Darling GOF Test	
5% A-D Critical Value	0.658	Detected data appear Gamma Distributed at 5% Significance Leve	
K-S Test Statistic	0.278	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.395	Detected data appear Gamma Distributed at 5% Significance Leve	
Detected data appear Gamma Distributed at 5% Significance Leve			

Gamma Statistics on Detected Data Only

k hat (MLE)	7.995	k star (bias corrected MLE)	2.165
Theta hat (MLE)	0.109	Theta star (bias corrected MLE)	0.404
nu hat (MLE)	63.96	nu star (bias corrected)	17.32
Mean (detects)	0.875		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.0421
Maximum	1.2	Median	0.01
SD	0.161	CV	3.835
k hat (MLE)	0.519	k star (bias corrected MLE)	0.512
Theta hat (MLE)	0.0811	Theta star (bias corrected MLE)	0.0822
nu hat (MLE)	133.8	nu star (bias corrected)	132
Adjusted Level of Significance (β)	0.0481		
Approximate Chi Square Value (132.04, α)	106.5	Adjusted Chi Square Value (132.04, β)	106.2
95% Gamma Approximate UCL (use when n>=50)	0.0521	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.192	SD (KM)	0.132
Variance (KM)	0.0173	SE of Mean (KM)	0.0134
k hat (KM)	2.123	k star (KM)	2.078
nu hat (KM)	547.6	nu star (KM)	536.2

APPENDIX B-2B
VOCs in Groundwater
micrograms per liter (µg/L)

theta hat (KM)	0.0904	theta star (KM)	0.0923
80% gamma percentile (KM)	0.286	90% gamma percentile (KM)	0.37
95% gamma percentile (KM)	0.45	99% gamma percentile (KM)	0.626

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (536.22, α)	483.5	Adjusted Chi Square Value (536.22, β)	483
95% Gamma Approximate KM-UCL (use when n>=50)	0.213	95% Gamma Adjusted KM-UCL (use when n<50)	0.213

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.89	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Lognormal at 5% Significance Leve	
Lilliefors Test Statistic	0.292	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.375	Detected Data appear Lognormal at 5% Significance Leve	
Detected Data appear Lognormal at 5% Significance Leve			

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.0753	Mean in Log Scale	-3.79
SD in Original Scale	0.167	SD in Log Scale	1.579
95% t UCL (assumes normality of ROS data)	0.0997	95% Percentile Bootstrap UCL	0.101
95% BCA Bootstrap UCL	0.108	95% Bootstrap t UCL	0.112
95% H-UCL (Log ROS)	0.116		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distributior

KM Mean (logged)	-1.723	KM Geo Mean	0.179
KM SD (logged)	0.281	95% Critical H Value (KM-Log)	1.721
KM Standard Error of Mean (logged)	0.0286	95% H-UCL (KM -Log)	0.194
KM SD (logged)	0.281	95% Critical H Value (KM-Log)	1.721
KM Standard Error of Mean (logged)	0.0286		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.143	Mean in Log Scale	-2.069
SD in Original Scale	0.141	SD in Log Scale	0.366
95% t UCL (Assumes normality)	0.164	95% H-Stat UCL	0.143

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Detected Data appear Normal Distributed at 5% Significance Leve

Suggested UCL to Use

95% KM (t) UCL	0.214

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
Recommendations are based upon data size, data distribution, and skewness
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statisticiar

APPENDIX B-2B
VOCs in Groundwater
micrograms per liter (µg/L)

1,3-Dichlorobenzene

General Statistics

APPENDIX B-2B
VOCs in Groundwater
micrograms per liter (µg/L)

Total Number of Observations	128	Number of Distinct Observations	2
Number of Detects	0	Number of Non-Detects	128
Number of Distinct Detects	0	Number of Distinct Non-Detects	2

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV)

The data set for variable S was not processed!

APPENDIX B-2B
VOCs in Groundwater
micrograms per liter (µg/L)

1,3-Dichloropropane

General Statistics

Total Number of Observations	129	Number of Distinct Observations	2
Number of Detects	0	Number of Non-Detects	129
Number of Distinct Detects	0	Number of Distinct Non-Detects	2

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV)

The data set for variable T was not processed!

APPENDIX B-2B
VOCs in Groundwater
micrograms per liter (µg/L)

1,4-Dichlorobenzene

General Statistics

Total Number of Observations	128	Number of Distinct Observations	2
Number of Detects	0	Number of Non-Detects	128
Number of Distinct Detects	0	Number of Distinct Non-Detects	2

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV)

The data set for variable U was not processed!

APPENDIX B-2B
VOCs in Groundwater
micrograms per liter (µg/L)

2,2-Dichloropropane

General Statistics

Total Number of Observations	128	Number of Distinct Observations	2
Number of Detects	0	Number of Non-Detects	128
Number of Distinct Detects	0	Number of Distinct Non-Detects	2

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV)

The data set for variable V was not processed!

APPENDIX B-2B
VOCs in Groundwater
micrograms per liter (µg/L)

2-Butanone

General Statistics

Total Number of Observations	128	Number of Distinct Observations	2
Number of Detects	0	Number of Non-Detects	128
Number of Distinct Detects	0	Number of Distinct Non-Detects	2

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV)

The data set for variable W was not processed!

APPENDIX B-2B
VOCs in Groundwater
micrograms per liter (µg/L)

2-Chlorotoluene

General Statistics

Total Number of Observations	128	Number of Distinct Observations	2
Number of Detects	0	Number of Non-Detects	128
Number of Distinct Detects	0	Number of Distinct Non-Detects	2

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV)

The data set for variable X was not processed!

APPENDIX B-2B
VOCs in Groundwater
micrograms per liter (µg/L)

2-Hexanone

General Statistics

Total Number of Observations	128	Number of Distinct Observations	2
Number of Detects	0	Number of Non-Detects	128
Number of Distinct Detects	0	Number of Distinct Non-Detects	2

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV)

The data set for variable Y was not processed!

APPENDIX B-2B
VOCs in Groundwater
micrograms per liter (µg/L)

4-Chlorotoluene

General Statistics

Total Number of Observations	128	Number of Distinct Observations	2
Number of Detects	0	Number of Non-Detects	128
Number of Distinct Detects	0	Number of Distinct Non-Detects	200.00%

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV)

The data set for variable Z was not processed!

APPENDIX B-2B
VOCs in Groundwater
micrograms per liter (µg/L)

4-Isopropyltoluene

General Statistics

Total Number of Observations	128	Number of Distinct Observations	7
Number of Detects	5	Number of Non-Detects	123
Number of Distinct Detects	5	Number of Distinct Non-Detects	2
Minimum Detect	0.26	Minimum Non-Detect	0.2
Maximum Detect	4.5	Maximum Non-Detect	0.25
Variance Detects	3.477	Percent Non-Detects	96.09%
Mean Detects	1.166	SD Detects	1.865
Median Detects	0.38	CV Detects	1.599
Skewness Detects	2.23	Kurtosis Detects	4.98
Mean of Logged Detects	-0.593	SD of Logged Detects	1.186

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.582	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.762	Detected Data Not Normal at 5% Significance Leve	
Lilliefors Test Statistic	0.459	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.343	Detected Data Not Normal at 5% Significance Leve	
Detected Data Not Normal at 5% Significance Leve			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.238	KM Standard Error of Mean	0.0375
KM SD	0.379	95% KM (BCA) UCL	0.305
95% KM (t) UCL	0.3	95% KM (Percentile Bootstrap) UCL	0.305
95% KM (z) UCL	0.299	95% KM Bootstrap t UCL	0.8
90% KM Chebyshev UCL	0.35	95% KM Chebyshev UCL	0.401
97.5% KM Chebyshev UCL	0.472	99% KM Chebyshev UCL	0.61

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	1.05	Anderson-Darling GOF Test	
5% A-D Critical Value	0.697	Detected Data Not Gamma Distributed at 5% Significance Leve	
K-S Test Statistic	0.46	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.366	Detected Data Not Gamma Distributed at 5% Significance Leve	
Detected Data Not Gamma Distributed at 5% Significance Leve			

Gamma Statistics on Detected Data Only

k hat (MLE)	0.796	k star (bias corrected MLE)	0.452
Theta hat (MLE)	1.466	Theta star (bias corrected MLE)	2.582
nu hat (MLE)	7.956	nu star (bias corrected)	4.516
Mean (detects)	1.166		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.0552
Maximum	4.5	Median	0.01
SD	0.4	CV	7.254
k hat (MLE)	0.421	k star (bias corrected MLE)	0.416
Theta hat (MLE)	0.131	Theta star (bias corrected MLE)	0.133
nu hat (MLE)	107.7	nu star (bias corrected)	106.5
Adjusted Level of Significance (β)	0.0481		
Approximate Chi Square Value (106.55, α)	83.73	Adjusted Chi Square Value (106.55, β)	83.5
95% Gamma Approximate UCL (use when n>=50)	0.0702	95% Gamma Adjusted UCL (use when n<50)	0.0704

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.238	SD (KM)	0.379
Variance (KM)	0.144	SE of Mean (KM)	0.0375
k hat (KM)	0.393	k star (KM)	0.389
nu hat (KM)	100.7	nu star (KM)	99.67

APPENDIX B-2B
VOCs in Groundwater
micrograms per liter (µg/L)

theta hat (KM)	0.604	theta star (KM)	0.611
80% gamma percentile (KM)	0.382	90% gamma percentile (KM)	0.675
95% gamma percentile (KM)	0.997	99% gamma percentile (KM)	1.81

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (99.67, α)	77.64	Adjusted Chi Square Value (99.67, β)	7742.00%
95% Gamma Approximate KM-UCL (use when n>=50)	0.305	95% Gamma Adjusted KM-UCL (use when n<50)	0.306

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.691	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.762	Detected Data Not Lognormal at 5% Significance Leve	
Lilliefors Test Statistic	0.407	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.343	Detected Data Not Lognormal at 5% Significance Leve	
Detected Data Not Lognormal at 5% Significance Leve			

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.0487	Mean in Log Scale	-9.503
SD in Original Scale	0.401	SD in Log Scale	4.076
95% t UCL (assumes normality of ROS data)	0.107	95% Percentile Bootstrap UCL	0.116
95% BCA Bootstrap UCL	0.156	95% Bootstrap t UCL	0.452
95% H-UCL (Log ROS)	2.592		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distributior

KM Mean (logged)	-1.57	KM Geo Mean	0.208
KM SD (logged)	0.288	95% Critical H Value (KM-Log)	1.723
KM Standard Error of Mean (logged)	0.0284	95% H-UCL (KM -Log)	0.227
KM SD (logged)	0.288	95% Critical H Value (KM-Log)	1.723
KM Standard Error of Mean (logged)	0.0284		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.163	Mean in Log Scale	-2.049
SD in Original Scale	0.388	SD in Log Scale	0.37
95% t UCL (Assumes normality)	0.219	95% H-Stat UCL	0.146

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Data do not follow a Discernible Distribution at 5% Significance Leve

Suggested UCL to Use

95% KM (Chebyshev) UCL	0.401

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
Recommendations are based upon data size, data distribution, and skewness
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statisticiar

APPENDIX B-2B
VOCs in Groundwater
micrograms per liter (µg/L)

4-Methyl-2-pentanone

General Statistics

Total Number of Observations	128	Number of Distinct Observations	2
Number of Detects	0	Number of Non-Detects	128
Number of Distinct Detects	0	Number of Distinct Non-Detects	2

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV)

The data set for variable B was not processed!

APPENDIX B-2B
VOCs in Groundwater
micrograms per liter (µg/L)

Acetone

General Statistics

Total Number of Observations	130	Number of Distinct Observations	6
Number of Detects	19	Number of Non-Detects	111
Number of Distinct Detects	6	Number of Distinct Non-Detects	2
Minimum Detect	10	Minimum Non-Detect	10
Maximum Detect	24	Maximum Non-Detect	20
Variance Detects	13.61	Percent Non-Detects	85.38%
Mean Detects	19.05	SD Detects	3.689
Median Detects	20	CV Detects	0.194
Skewness Detects	-1.598	Kurtosis Detects	2.682
Mean of Logged Detects	2.924	SD of Logged Detects	0.239

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.712	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.901	Detected Data Not Normal at 5% Significance Leve	
Lilliefors Test Statistic	0.391	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.197	Detected Data Not Normal at 5% Significance Leve	
Detected Data Not Normal at 5% Significance Leve			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	11.34	KM Standard Error of Mean	0.316
KM SD	3.49	95% KM (BCA) UCL	11.85
95% KM (t) UCL	11.86	95% KM (Percentile Bootstrap) UCL	11.83
95% KM (z) UCL	11.86	95% KM Bootstrap t UCL	11.96
90% KM Chebyshev UCL	12.29	95% KM Chebyshev UCL	12.72
97.5% KM Chebyshev UCL	13.31	99% KM Chebyshev UCL	14.48

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	3.04	Anderson-Darling GOF Test	
5% A-D Critical Value	0.74	Detected Data Not Gamma Distributed at 5% Significance Leve	
K-S Test Statistic	0.407	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.198	Detected Data Not Gamma Distributed at 5% Significance Leve	
Detected Data Not Gamma Distributed at 5% Significance Leve			

Gamma Statistics on Detected Data Only

k hat (MLE)	21.57	k star (bias corrected MLE)	18.2
Theta hat (MLE)	0.883	Theta star (bias corrected MLE)	1.047
nu hat (MLE)	819.5	nu star (bias corrected)	691.5
Mean (detects)	19.05		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	10.02
Maximum	24	Median	9.611
SD	5.399	CV	0.539
k hat (MLE)	2.074	k star (bias corrected MLE)	2.032
Theta hat (MLE)	4.831	Theta star (bias corrected MLE)	4.932
nu hat (MLE)	539.3	nu star (bias corrected)	528.2
Adjusted Level of Significance (β)	0.0482		
Approximate Chi Square Value (528.22, α)	475.9	Adjusted Chi Square Value (528.22, β)	475.4
95% Gamma Approximate UCL (use when n>=50)	11.12	95% Gamma Adjusted UCL (use when n<50)	11.13

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	11.34	SD (KM)	3.49
Variance (KM)	12.18	SE of Mean (KM)	0.316
k hat (KM)	10.56	k star (KM)	10.32
nu hat (KM)	2745	nu star (KM)	2683

APPENDIX B-2B
VOCs in Groundwater
micrograms per liter (µg/L)

theta hat (KM)	1.074	theta star (KM)	1.099
80% gamma percentile (KM)	14.15	90% gamma percentile (KM)	16.03
95% gamma percentile (KM)	17.7	99% gamma percentile (KM)	21.12

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (N/A, α)	2564	Adjusted Chi Square Value (N/A, β)	2562
95% Gamma Approximate KM-UCL (use when n>=50)	11.87	95% Gamma Adjusted KM-UCL (use when n<50)	11.87

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.643	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.901	Detected Data Not Lognormal at 5% Significance Leve	
Lilliefors Test Statistic	0.408	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.197	Detected Data Not Lognormal at 5% Significance Leve	
Detected Data Not Lognormal at 5% Significance Leve			

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	10.77	Mean in Log Scale	2.296
SD in Original Scale	4.498	SD in Log Scale	0.4
95% t UCL (assumes normality of ROS data)	1.14E+01	95% Percentile Bootstrap UCL	1.14E+01
95% BCA Bootstrap UCL	11.44	95% Bootstrap t UCL	11.44
95% H-UCL (Log ROS)	11.46		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distributior

KM Mean (logged)	2.395	KM Geo Mean	10.96
KM SD (logged)	0.238	95% Critical H Value (KM-Log)	1.706
KM Standard Error of Mean (logged)	0.0215	95% H-UCL (KM -Log)	11.69
KM SD (logged)	0.238	95% Critical H Value (KM-Log)	1.706
KM Standard Error of Mean (logged)	0.0215		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	7.669	Mean in Log Scale	1.887
SD in Original Scale	5.187	SD in Log Scale	0.494
95% t UCL (Assumes normality)	8.423	95% H-Stat UCL	8.072
DL/2 is not a recommended method, provided for comparisons and historical reasons			

Nonparametric Distribution Free UCL Statistics
Data do not follow a Discernible Distribution at 5% Significance Leve

Suggested UCL to Use

95% KM (t) UCL	11.86	KM H-UCL	11.69
95% KM (BCA) UCL	11.85		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
Recommendations are based upon data size, data distribution, and skewness
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statisticiar

APPENDIX B-2B
VOCs in Groundwater
micrograms per liter (µg/L)

Benzene

General Statistics

Total Number of Observations	130	Number of Distinct Observations	11
Number of Detects	12	Number of Non-Detects	118
Number of Distinct Detects	10	Number of Distinct Non-Detects	1
Minimum Detect	0.29	Minimum Non-Detect	0.25
Maximum Detect	14	Maximum Non-Detect	0.25
Variance Detects	15.8	Percent Non-Detects	90.77%
Mean Detects	3.653	SD Detects	3.974
Median Detects	2.6	CV Detects	1.088
Skewness Detects	1.735	Kurtosis Detects	3.605
Mean of Logged Detects	0.641	SD of Logged Detects	1.324

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.806	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.859	Detected Data Not Normal at 5% Significance Leve	
Lilliefors Test Statistic	0.206	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.243	Detected Data appear Normal at 5% Significance Leve	
Detected Data appear Approximate Normal at 5% Significance Leve			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.564	KM Standard Error of Mean	0.139
KM SD	1.519	95% KM (BCA) UCL	0.788
95% KM (t) UCL	0.795	95% KM (Percentile Bootstrap) UCL	0.812
95% KM (z) UCL	0.793	95% KM Bootstrap t UCL	0.987
90% KM Chebyshev UCL	0.981	95% KM Chebyshev UCL	117.10%
97.5% KM Chebyshev UCL	1.433	99% KM Chebyshev UCL	1.948

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.371	Anderson-Darling GOF Test	
5% A-D Critical Value	0.76	Detected data appear Gamma Distributed at 5% Significance Leve	
K-S Test Statistic	0.144	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.253	Detected data appear Gamma Distributed at 5% Significance Leve	
Detected data appear Gamma Distributed at 5% Significance Leve			

Gamma Statistics on Detected Data Only

k hat (MLE)	0.894	k star (bias corrected MLE)	0.726
Theta hat (MLE)	4.085	Theta star (bias corrected MLE)	5.03
nu hat (MLE)	21.46	nu star (bias corrected)	17.43
Mean (detects)	3.653		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.346
Maximum	14	Median	0.01
SD	1.571	CV	4.537
k hat (MLE)	0.235	k star (bias corrected MLE)	0.234
Theta hat (MLE)	1.476	Theta star (bias corrected MLE)	1.478
nu hat (MLE)	60.97	nu star (bias corrected)	60.9
Adjusted Level of Significance (β)	0.0482		
Approximate Chi Square Value (60.90, α)	43.95	Adjusted Chi Square Value (60.90, β)	43.79
95% Gamma Approximate UCL (use when n>=50)	0.48	95% Gamma Adjusted UCL (use when n<50)	0.481

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.564	SD (KM)	1.519
Variance (KM)	2.307	SE of Mean (KM)	0.139
k hat (KM)	0.138	k star (KM)	0.14
nu hat (KM)	35.87	nu star (KM)	36.37

APPENDIX B-2B
VOCs in Groundwater
micrograms per liter (µg/L)

theta hat (KM)	4.089	theta star (KM)	4.032
80% gamma percentile (KM)	0.578	90% gamma percentile (KM)	1.654
95% gamma percentile (KM)	3.15E+00	99% gamma percentile (KM)	7.54E+00

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (36.37, α)	23.57	Adjusted Chi Square Value (36.37, β)	23.45
95% Gamma Approximate KM-UCL (use when n>=50)	0.871	95% Gamma Adjusted KM-UCL (use when n<50)	0.875

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.916	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.859	Detected Data appear Lognormal at 5% Significance Leve	
Lilliefors Test Statistic	0.193	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.243	Detected Data appear Lognormal at 5% Significance Leve	
Detected Data appear Lognormal at 5% Significance Leve			

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.36	Mean in Log Scale	-5.84
SD in Original Scale	1.569	SD in Log Scale	3.606
95% t UCL (assumes normality of ROS data)	0.587	95% Percentile Bootstrap UCL	0.601
95% BCA Bootstrap UCL	0.694	95% Bootstrap t UCL	0.783
95% H-UCL (Log ROS)	10.46		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distributior

KM Mean (logged)	-1.199	KM Geo Mean	0.301
KM SD (logged)	0.702	95% Critical H Value (KM-Log)	1.952
KM Standard Error of Mean (logged)	0.0643	95% H-UCL (KM -Log)	0.435
KM SD (logged)	0.702	95% Critical H Value (KM-Log)	1.952
KM Standard Error of Mean (logged)	0.0643		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.451	Mean in Log Scale	-1.828
SD in Original Scale	1.548	SD in Log Scale	0.88
95% t UCL (Assumes normality)	0.676	95% H-Stat UCL	0.278

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Detected Data appear Approximate Normal Distributed at 5% Significance Leve

Suggested UCL to Use

95% KM (t) UCL	0.795

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF tes
When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCI

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
Recommendations are based upon data size, data distribution, and skewness
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician

APPENDIX B-2B
VOCs in Groundwater
micrograms per liter (µg/L)

Bromobenzene

General Statistics

Total Number of Observations	128	Number of Distinct Observations	2
Number of Detects	0	Number of Non-Detects	128
Number of Distinct Detects	0	Number of Distinct Non-Detects	2

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV)

The data set for variable E was not processed!

APPENDIX B-2B
VOCs in Groundwater
micrograms per liter (µg/L)

Bromochloromethane

General Statistics

Total Number of Observations	128	Number of Distinct Observations	1
Number of Detects	0	Number of Non-Detects	128
Number of Distinct Detects	0	Number of Distinct Non-Detects	100.00%

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV)

The data set for variable F was not processed!

APPENDIX B-2B
VOCs in Groundwater
micrograms per liter (µg/L)

Bromodichloromethane

General Statistics

Total Number of Observations	128	Number of Distinct Observations	2
Number of Detects	0	Number of Non-Detects	128
Number of Distinct Detects	0	Number of Distinct Non-Detects	2

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV)

The data set for variable G was not processed!

APPENDIX B-2B
VOCs in Groundwater
micrograms per liter (µg/L)

Bromoform

General Statistics

Total Number of Observations	128	Number of Distinct Observations	2
Number of Detects	0	Number of Non-Detects	128
Number of Distinct Detects	0	Number of Distinct Non-Detects	2

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV)

The data set for variable H was not processed!

APPENDIX B-2B
VOCs in Groundwater
micrograms per liter (µg/L)

Bromomethane

General Statistics

Total Number of Observations	128	Number of Distinct Observations	2
Number of Detects	0	Number of Non-Detects	128
Number of Distinct Detects	0	Number of Distinct Non-Detects	2

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV)

The data set for variable I was not processed!

APPENDIX B-2B
VOCs in Groundwater
micrograms per liter (µg/L)

Carbon disulfide

General Statistics

Total Number of Observations	128	Number of Distinct Observations	2
Number of Detects	0	Number of Non-Detects	128
Number of Distinct Detects	0	Number of Distinct Non-Detects	2

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV)

The data set for variable J was not processed!

APPENDIX B-2B
VOCs in Groundwater
micrograms per liter (µg/L)

Carbon tetrachloride

General Statistics

Total Number of Observations	128	Number of Distinct Observations	2
Number of Detects	0	Number of Non-Detects	128
Number of Distinct Detects	0	Number of Distinct Non-Detects	2

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV)

The data set for variable K was not processed!

APPENDIX B-2B
VOCs in Groundwater
micrograms per liter (µg/L)

Chlorobenzene

General Statistics

Total Number of Observations	128	Number of Distinct Observations	2
Number of Detects	0	Number of Non-Detects	128
Number of Distinct Detects	0	Number of Distinct Non-Detects	2

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV)

The data set for variable L was not processed!

APPENDIX B-2B
VOCs in Groundwater
micrograms per liter (µg/L)

Chloroethane

General Statistics

Total Number of Observations	128	Number of Distinct Observations	5
Number of Detects	3	Number of Non-Detects	125
Number of Distinct Detects	3	Number of Distinct Non-Detects	2
Minimum Detect	4.5	Minimum Non-Detect	0.17
Maximum Detect	77	Maximum Non-Detect	0.4
Variance Detects	1629	Percent Non-Detects	97.66%
Mean Detects	30.5	SD Detects	40.36
Median Detects	10	CV Detects	1.323
Skewness Detects	1.696	Kurtosis Detects	N/A
Mean of Logged Detects	2.717	SD of Logged Detects	1.464

Warning: Data set has only 3 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.807	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Normal at 5% Significance Leve	
Lilliefors Test Statistic	0.361	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.425	Detected Data appear Normal at 5% Significance Leve	

Detected Data appear Normal at 5% Significance Leve

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.881	KM Standard Error of Mean	0.738
KM SD	6.82	95% KM (BCA) UCL	N/A
95% KM (t) UCL	2.104	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	2.095	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	3.096	95% KM Chebyshev UCL	4.099
97.5% KM Chebyshev UCL	5.491	99% KM Chebyshev UCL	8.227

Gamma GOF Tests on Detected Observations Only
Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	0.841	k star (bias corrected MLE)	N/A
Theta hat (MLE)	36.26	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	5.047	nu star (bias corrected)	N/A
Mean (detects)	30.5		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.725
Maximum	77	Median	0.01
SD	6.863	CV	9.472
k hat (MLE)	0.182	k star (bias corrected MLE)	0.183
Theta hat (MLE)	3.989	Theta star (bias corrected MLE)	3.968
nu hat (MLE)	46.51	nu star (bias corrected)	46.75
Adjusted Level of Significance (β)	0.0481		
Approximate Chi Square Value (46.75, α)	32.06	Adjusted Chi Square Value (46.75, β)	31.92
95% Gamma Approximate UCL (use when n>=50)	1.057	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.881	SD (KM)	6.82
Variance (KM)	46.51	SE of Mean (KM)	0.738
k hat (KM)	0.0167	k star (KM)	0.0215
nu hat (KM)	4.271	nu star (KM)	5.504

APPENDIX B-2B
VOCs in Groundwater
micrograms per liter (µg/L)

theta hat (KM)	52.8	theta star (KM)	40.97
80% gamma percentile (KM)	7.27E-04	90% gamma percentile (KM)	0.175
95% gamma percentile (KM)	2.273	99% gamma percentile (KM)	24.38
Gamma Kaplan-Meier (KM) Statistics			
Approximate Chi Square Value (5.50, α)	1.392	Adjusted Chi Square Value (5.50, β)	1.369
95% Gamma Approximate KM-UCL (use when n>=50)	3.483	95% Gamma Adjusted KM-UCL (use when n<50)	3.542
Lognormal GOF Test on Detected Observations Only			
Shapiro Wilk Test Statistic	0.94	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Lognormal at 5% Significance Leve	
Lilliefors Test Statistic	0.278	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.425	Detected Data appear Lognormal at 5% Significance Leve	
Detected Data appear Lognormal at 5% Significance Leve			
Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	0.726	Mean in Log Scale	-13.27
SD in Original Scale	6.863	SD in Log Scale	6.71
95% t UCL (assumes normality of ROS data)	1.731	95% Percentile Bootstrap UCL	1.928
95% BCA Bootstrap UCL	3.091	95% Bootstrap t UCL	12.49
95% H-UCL (Log ROS)	2.99E+06		
Statistics using KM estimates on Logged Data and Assuming Lognormal Distributior			
KM Mean (logged)	-1.667	KM Geo Mean	0.189
KM SD (logged)	0.703	95% Critical H Value (KM-Log)	1.952
KM Standard Error of Mean (logged)	0.0761	95% H-UCL (KM -Log)	0.273
KM SD (logged)	0.703	95% Critical H Value (KM-Log)	1.952
KM Standard Error of Mean (logged)	0.0761		
DL/2 Statistics			
DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.896	Mean in Log Scale	-1.615
SD in Original Scale	6.845	SD in Log Scale	0.754
95% t UCL (Assumes normality)	1.898	95% H-Stat UCL	0.302
DL/2 is not a recommended method, provided for comparisons and historical reasons			
Nonparametric Distribution Free UCL Statistics			
Detected Data appear Normal Distributed at 5% Significance Leve			
Suggested UCL to Use			
95% KM (t) UCL	2.104		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
Recommendations are based upon data size, data distribution, and skewness
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statisticiar

APPENDIX B-2B
VOCs in Groundwater
micrograms per liter (µg/L)

Chloroform

General Statistics

Total Number of Observations	128	Number of Distinct Observations	2
Number of Detects	0	Number of Non-Detects	128
Number of Distinct Detects	0	Number of Distinct Non-Detects	2

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV)

The data set for variable N was not processed!

APPENDIX B-2B
VOCs in Groundwater
micrograms per liter (µg/L)

Chloromethane

General Statistics

Total Number of Observations	128	Number of Distinct Observations	2
Number of Detects	0	Number of Non-Detects	128
Number of Distinct Detects	0	Number of Distinct Non-Detects	2

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV)

The data set for variable O was not processed!

APPENDIX B-2B
VOCs in Groundwater
micrograms per liter (µg/L)

cis-1,2-Dichloroethene

General Statistics

Total Number of Observations	129	Number of Distinct Observations	10
Number of Detects	8	Number of Non-Detects	121
Number of Distinct Detects	8	Number of Distinct Non-Detects	2
Minimum Detect	0.33	Minimum Non-Detect	0.076
Maximum Detect	45	Maximum Non-Detect	0.25
Variance Detects	241.6	Percent Non-Detects	93.80%
Mean Detects	6.631	SD Detects	15.54
Median Detects	0.63	CV Detects	2.344
Skewness Detects	2.799	Kurtosis Detects	7.871
Mean of Logged Detects	0.25	SD of Logged Detects	1.665

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.475	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.818	Detected Data Not Normal at 5% Significance Leve	
Lilliefors Test Statistic	0.452	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.283	Detected Data Not Normal at 5% Significance Leve	

Detected Data Not Normal at 5% Significance Leve

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.483	KM Standard Error of Mean	0.372
KM SD	3.951	95% KM (BCA) UCL	1.191
95% KM (t) UCL	1.099	95% KM (Percentile Bootstrap) UCL	1.175
95% KM (z) UCL	1.094	95% KM Bootstrap t UCL	8.141
90% KM Chebyshev UCL	1.598	95% KM Chebyshev UCL	2.104
97.5% KM Chebyshev UCL	2.805	99% KM Chebyshev UCL	4.183

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	1.232	Anderson-Darling GOF Test	
5% A-D Critical Value	0.78	Detected Data Not Gamma Distributed at 5% Significance Leve	
K-S Test Statistic	0.311	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.313	Detected data appear Gamma Distributed at 5% Significance Leve	

Detected data follow Appr. Gamma Distribution at 5% Significance Leve

Gamma Statistics on Detected Data Only

k hat (MLE)	0.401	k star (bias corrected MLE)	0.334
Theta hat (MLE)	16.55	Theta star (bias corrected MLE)	19.87
nu hat (MLE)	6.412	nu star (bias corrected)	5.341
Mean (detects)	6.631		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.421
Maximum	45	Median	0.01
SD	3.973	CV	9.446
k hat (MLE)	0.212	k star (bias corrected MLE)	0.212
Theta hat (MLE)	1.983	Theta star (bias corrected MLE)	1.981
nu hat (MLE)	54.72	nu star (bias corrected)	54.78
Adjusted Level of Significance (β)	0.0481		
Approximate Chi Square Value (54.78, α)	38.77	Adjusted Chi Square Value (54.78, β)	38.62
95% Gamma Approximate UCL (use when n>=50)	0.594	95% Gamma Adjusted UCL (use when n<50)	0.597

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.483	SD (KM)	3.951
Variance (KM)	15.61	SE of Mean (KM)	0.372
k hat (KM)	0.0149	k star (KM)	0.0197
nu hat (KM)	3.848	nu star (KM)	5.092

APPENDIX B-2B
VOCs in Groundwater
micrograms per liter (µg/L)

theta hat (KM)	32.35	theta star (KM)	24.45
80% gamma percentile (KM)	1.71E-04	90% gamma percentile (KM)	0.0672
95% gamma percentile (KM)	1.083	99% gamma percentile (KM)	13.5

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (5.09, α)	1.195	Adjusted Chi Square Value (5.09, β)	1.174
95% Gamma Approximate KM-UCL (use when n>=50)	2.056	95% Gamma Adjusted KM-UCL (use when n<50)	2.093

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.812	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.818	Detected Data Not Lognormal at 5% Significance Leve	
Lilliefors Test Statistic	0.267	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.283	Detected Data appear Lognormal at 5% Significance Leve	

Detected Data appear Approximate Lognormal at 5% Significance Leve

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.415	Mean in Log Scale	-10.3
SD in Original Scale	3.974	SD in Log Scale	5.291
95% t UCL (assumes normality of ROS data)	0.994	95% Percentile Bootstrap UCL	1.108
95% BCA Bootstrap UCL	1.513	95% Bootstrap t UCL	12.05
95% H-UCL (Log ROS)	1393		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distributior

KM Mean (logged)	-2.402	KM Geo Mean	0.0906
KM SD (logged)	0.784	95% Critical H Value (KM-Log)	2.012
KM Standard Error of Mean (logged)	0.0738	95% H-UCL (KM -Log)	0.142
KM SD (logged)	0.784	95% Critical H Value (KM-Log)	2.012
KM Standard Error of Mean (logged)	0.0738		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.518	Mean in Log Scale	-2.083
SD in Original Scale	3.963	SD in Log Scale	0.817
95% t UCL (Assumes normality)	1.096	95% H-Stat UCL	0.202

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Detected Data appear Approximate Gamma Distributed at 5% Significance Leve

Suggested UCL to Use

95% KM Approximate Gamma UCL	2.056

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF tes
When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCI

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
Recommendations are based upon data size, data distribution, and skewness
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statisticiar

APPENDIX B-2B
VOCs in Groundwater
micrograms per liter (µg/L)

cis-1,3-Dichloropropene

General Statistics

Total Number of Observations	128	Number of Distinct Observations	2
Number of Detects	0	Number of Non-Detects	128
Number of Distinct Detects	0	Number of Distinct Non-Detects	2

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV)

The data set for variable Q was not processed!

APPENDIX B-2B
VOCs in Groundwater
micrograms per liter (µg/L)

Dibromochloromethane

General Statistics

Total Number of Observations	128	Number of Distinct Observations	2
Number of Detects	0	Number of Non-Detects	128
Number of Distinct Detects	0	Number of Distinct Non-Detects	2

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV)

The data set for variable R was not processed!

APPENDIX B-2B
VOCs in Groundwater
micrograms per liter (µg/L)

Dibromomethane

General Statistics

Total Number of Observations	128	Number of Distinct Observations	2
Number of Detects	0	Number of Non-Detects	128
Number of Distinct Detects	0	Number of Distinct Non-Detects	2

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV)

The data set for variable S was not processed!

APPENDIX B-2B
VOCs in Groundwater
micrograms per liter (µg/L)

Dichlorodifluoromethane

General Statistics

Total Number of Observations	128	Number of Distinct Observations	2
Number of Detects	0	Number of Non-Detects	128
Number of Distinct Detects	0	Number of Distinct Non-Detects	2

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV)

The data set for variable T was not processed!

APPENDIX B-2B
VOCs in Groundwater
micrograms per liter (µg/L)

Ethylbenzene

General Statistics

Total Number of Observations	129	Number of Distinct Observations	8
Number of Detects	6	Number of Non-Detects	123
Number of Distinct Detects	6	Number of Distinct Non-Detects	2
Minimum Detect	0.27	Minimum Non-Detect	0.13
Maximum Detect	7.3	Maximum Non-Detect	0.25
Variance Detects	8.964	Percent Non-Detects	95.35%
Mean Detects	2.538	SD Detects	2.994
Median Detects	0.92	CV Detects	1.18
Skewness Detects	1.122	Kurtosis Detects	-0.762
Mean of Logged Detects	0.248	SD of Logged Detects	1.312

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.775	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.788	Detected Data Not Normal at 5% Significance Leve	
Lilliefors Test Statistic	0.351	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.325	Detected Data Not Normal at 5% Significance Leve	
Detected Data Not Normal at 5% Significance Leve			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.242	KM Standard Error of Mean	0.075
KM SD	0.778	95% KM (BCA) UCL	0.374
95% KM (t) UCL	0.366	95% KM (Percentile Bootstrap) UCL	0.367
95% KM (z) UCL	0.365	95% KM Bootstrap t UCL	0.719
90% KM Chebyshev UCL	0.467	95% KM Chebyshev UCL	0.569
97.5% KM Chebyshev UCL	0.71	99% KM Chebyshev UCL	0.988

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.49	Anderson-Darling GOF Test	
5% A-D Critical Value	0.718	Detected data appear Gamma Distributed at 5% Significance Leve	
K-S Test Statistic	0.285	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.342	Detected data appear Gamma Distributed at 5% Significance Leve	
Detected data appear Gamma Distributed at 5% Significance Leve			

Gamma Statistics on Detected Data Only

k hat (MLE)	0.86	k star (bias corrected MLE)	0.541
Theta hat (MLE)	2.95E+00	Theta star (bias corrected MLE)	4.69E+00
nu hat (MLE)	10.32	nu star (bias corrected)	6.493
Mean (detects)	2.538		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.128
Maximum	7.3	Median	0.01
SD	0.797	CV	6.25
k hat (MLE)	0.298	k star (bias corrected MLE)	0.296
Theta hat (MLE)	0.429	Theta star (bias corrected MLE)	0.431
nu hat (MLE)	76.77	nu star (bias corrected)	76.32
Adjusted Level of Significance (β)	0.0481		
Approximate Chi Square Value (76.32, α)	57.19	Adjusted Chi Square Value (76.32, β)	57.01
95% Gamma Approximate UCL (use when n>=50)	0.17	95% Gamma Adjusted UCL (use when n<50)	0.171

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.242	SD (KM)	0.778
Variance (KM)	0.605	SE of Mean (KM)	0.075
k hat (KM)	0.0969	k star (KM)	0.0998
nu hat (KM)	24.99	nu star (KM)	25.74

APPENDIX B-2B
VOCs in Groundwater
micrograms per liter (µg/L)

theta hat (KM)	2.499	theta star (KM)	2.426
80% gamma percentile (KM)	0.167	90% gamma percentile (KM)	0.644
95% gamma percentile (KM)	1.405	99% gamma percentile (KM)	3.849
Gamma Kaplan-Meier (KM) Statistics			
Approximate Chi Square Value (25.74, α)	15.18	Adjusted Chi Square Value (25.74, β)	15.09
95% Gamma Approximate KM-UCL (use when n>=50)	0.41	95% Gamma Adjusted KM-UCL (use when n<50)	0.413

APPENDIX B-2B
VOCs in Groundwater
micrograms per liter (µg/L)

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.915	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.788	Detected Data appear Lognormal at 5% Significance Leve	
Lilliefors Test Statistic	0.213	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.325	Detected Data appear Lognormal at 5% Significance Leve	

Detected Data appear Lognormal at 5% Significance Leve

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.123	Mean in Log Scale	-944.90%
SD in Original Scale	0.798	SD in Log Scale	4.584
95% t UCL (assumes normality of ROS data)	0.24	95% Percentile Bootstrap UCL	0.246
95% BCA Bootstrap UCL	0.312	95% Bootstrap t UCL	0.854
95% H-UCL (Log ROS)	42.09		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distributior

KM Mean (logged)	-1.934	KM Geo Mean	0.145
KM SD (logged)	0.547	95% Critical H Value (KM-Log)	1.851
KM Standard Error of Mean (logged)	0.0527	95% H-UCL (KM -Log)	0.184
KM SD (logged)	0.547	95% Critical H Value (KM-Log)	1.851
KM Standard Error of Mean (logged)	0.0527		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.23	Mean in Log Scale	-2.052
SD in Original Scale	0.783	SD in Log Scale	0.611
95% t UCL (Assumes normality)	0.344	95% H-Stat UCL	0.171

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Detected Data appear Gamma Distributed at 5% Significance Leve

Suggested UCL to Use
95% KM Approximate Gamma UCL 0.41

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
Recommendations are based upon data size, data distribution, and skewness
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statisticiar

APPENDIX B-2B
VOCs in Groundwater
micrograms per liter (µg/L)

Hexachlorobutadiene

General Statistics

Total Number of Observations	128	Number of Distinct Observations	2
Number of Detects	0	Number of Non-Detects	128
Number of Distinct Detects	0	Number of Distinct Non-Detects	2

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV)

The data set for variable V was not processed!

APPENDIX B-2B
VOCs in Groundwater
micrograms per liter (µg/L)

Isopropylbenzene

General Statistics

Total Number of Observations	129	Number of Distinct Observations	11
Number of Detects	10	Number of Non-Detects	119
Number of Distinct Detects	10	Number of Distinct Non-Detects	2
Minimum Detect	0.25	Minimum Non-Detect	0.2
Maximum Detect	1.6	Maximum Non-Detect	0.25
Variance Detects	0.179	Percent Non-Detects	92.25%
Mean Detects	0.834	SD Detects	0.423
Median Detects	0.75	CV Detects	0.507
Skewness Detects	0.637	Kurtosis Detects	-0.3
Mean of Logged Detects	-0.308	SD of Logged Detects	0.551

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.943	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.842	Detected Data appear Normal at 5% Significance Leve	
Lilliefors Test Statistic	0.185	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.262	Detected Data appear Normal at 5% Significance Leve	
Detected Data appear Normal at 5% Significance Leve			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.249	KM Standard Error of Mean	0.0188
KM SD	0.203	95% KM (BCA) UCL	0.283
95% KM (t) UCL	0.28	95% KM (Percentile Bootstrap) UCL	0.28
95% KM (z) UCL	0.28	95% KM Bootstrap t UCL	0.29
90% KM Chebyshev UCL	0.306	95% KM Chebyshev UCL	0.331
97.5% KM Chebyshev UCL	0.367	99% KM Chebyshev UCL	0.437

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.21	Anderson-Darling GOF Test	
5% A-D Critical Value	0.729	Detected data appear Gamma Distributed at 5% Significance Leve	
K-S Test Statistic	0.146	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.268	Detected data appear Gamma Distributed at 5% Significance Leve	
Detected data appear Gamma Distributed at 5% Significance Leve			

Gamma Statistics on Detected Data Only

k hat (MLE)	4.119	k star (bias corrected MLE)	2.95
Theta hat (MLE)	0.202	Theta star (bias corrected MLE)	0.283
nu hat (MLE)	82.39	nu star (bias corrected)	59
Mean (detects)	0.834		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.0787
Maximum	1.6	Median	0.01
SD	0.248	CV	3.157
k hat (MLE)	0.401	k star (bias corrected MLE)	0.397
Theta hat (MLE)	0.196	Theta star (bias corrected MLE)	0.198
nu hat (MLE)	103.6	nu star (bias corrected)	102.5
Adjusted Level of Significance (β)	0.0481		
Approximate Chi Square Value (102.50, α)	80.14	Adjusted Chi Square Value (102.50, β)	79.92
95% Gamma Approximate UCL (use when n>=50)	0.101	95% Gamma Adjusted UCL (use when n<50)	0.101

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.249	SD (KM)	0.203
Variance (KM)	0.0412	SE of Mean (KM)	0.0188
k hat (KM)	1.506	k star (KM)	1.476
nu hat (KM)	388.5	nu star (KM)	380.8

APPENDIX B-2B
VOCs in Groundwater
micrograms per liter (µg/L)

theta hat (KM)	0.165	theta star (KM)	0.169
80% gamma percentile (KM)	0.386	90% gamma percentile (KM)	0.521
95% gamma percentile (KM)	0.653	99% gamma percentile (KM)	0.949

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (380.75, α)	336.5	Adjusted Chi Square Value (380.75, β)	336.1
95% Gamma Approximate KM-UCL (use when n>=50)	0.282	95% Gamma Adjusted KM-UCL (use when n<50)	0.282

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.963	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.842	Detected Data appear Lognormal at 5% Significance Leve	
Lilliefors Test Statistic	0.12	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.262	Detected Data appear Lognormal at 5% Significance Leve	
Detected Data appear Lognormal at 5% Significance Leve			

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.122	Mean in Log Scale	-3.275
SD in Original Scale	0.246	SD in Log Scale	1.566
95% t UCL (assumes normality of ROS data)	0.158	95% Percentile Bootstrap UCL	0.159
95% BCA Bootstrap UCL	0.163	95% Bootstrap t UCL	0.171
95% H-UCL (Log ROS)	0.189		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distributior

KM Mean (logged)	-1.509	KM Geo Mean	0.221
KM SD (logged)	0.377	95% Critical H Value (KM-Log)	1.761
KM Standard Error of Mean (logged)	0.035	95% H-UCL (KM -Log)	0.252
KM SD (logged)	0.377	95% Critical H Value (KM-Log)	1.761
KM Standard Error of Mean (logged)	0.035		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.177	Mean in Log Scale	-1.968
SD in Original Scale	0.222	SD in Log Scale	0.51
95% t UCL (Assumes normality)	0.209	95% H-Stat UCL	0.173

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Detected Data appear Normal Distributed at 5% Significance Leve

Suggested UCL to Use
95% KM (t) UCL 0.28

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
Recommendations are based upon data size, data distribution, and skewness
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statisticiar

APPENDIX B-2B
VOCs in Groundwater
micrograms per liter (µg/L)

Methylene Chloride

General Statistics

Total Number of Observations	128	Number of Distinct Observations	2
Number of Detects	0	Number of Non-Detects	128
Number of Distinct Detects	0	Number of Distinct Non-Detects	2

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV)

The data set for variable X was not processed!

APPENDIX B-2B
VOCs in Groundwater
micrograms per liter (µg/L)

Methyl-tert-butyl ether (MTBE)

General Statistics

Total Number of Observations	130	Number of Distinct Observations	41
Number of Detects	49	Number of Non-Detects	81
Number of Distinct Detects	39	Number of Distinct Non-Detects	2
Minimum Detect	0.3	Minimum Non-Detect	0.11
Maximum Detect	11	Maximum Non-Detect	0.25
Variance Detects	6.123	Percent Non-Detects	62.31%
Mean Detects	3.15	SD Detects	2.474
Median Detects	2.4	CV Detects	0.786
Skewness Detects	0.991	Kurtosis Detects	0.606
Mean of Logged Detects	0.781	SD of Logged Detects	0.945

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.899	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.947	Detected Data Not Normal at 5% Significance Leve	
Lilliefors Test Statistic	0.148	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.126	Detected Data Not Normal at 5% Significance Leve	
Detected Data Not Normal at 5% Significance Leve			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	1.256	KM Standard Error of Mean	0.187
KM SD	2.105	95% KM (BCA) UCL	1.565
95% KM (t) UCL	1.565	95% KM (Percentile Bootstrap) UCL	1.592
95% KM (z) UCL	1.562	95% KM Bootstrap t UCL	1.616
90% KM Chebyshev UCL	1.815	95% KM Chebyshev UCL	2.069
97.5% KM Chebyshev UCL	2.421	99% KM Chebyshev UCL	3.112

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.363	Anderson-Darling GOF Test	
5% A-D Critical Value	0.767	Detected data appear Gamma Distributed at 5% Significance Leve	
K-S Test Statistic	0.0847	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.129	Detected data appear Gamma Distributed at 5% Significance Leve	
Detected data appear Gamma Distributed at 5% Significance Leve			

Gamma Statistics on Detected Data Only

k hat (MLE)	1.512	k star (bias corrected MLE)	1.433
Theta hat (MLE)	2.084	Theta star (bias corrected MLE)	2.198
nu hat (MLE)	148.1	nu star (bias corrected)	140.4
Mean (detects)	3.15		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	1.201
Maximum	11	Median	0.01
SD	2.144	CV	1.785
k hat (MLE)	0.266	k star (bias corrected MLE)	0.265
Theta hat (MLE)	4.518	Theta star (bias corrected MLE)	4.535
nu hat (MLE)	69.11	nu star (bias corrected)	68.85
Adjusted Level of Significance (β)	0.0482		
Approximate Chi Square Value (68.85, α)	50.75	Adjusted Chi Square Value (68.85, β)	50.58
95% Gamma Approximate UCL (use when n>=50)	1.629	95% Gamma Adjusted UCL (use when n<50)	1.635

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	1.256	SD (KM)	2.105
Variance (KM)	4.431	SE of Mean (KM)	0.187
k hat (KM)	0.356	k star (KM)	0.353
nu hat (KM)	92.53	nu star (KM)	91.73

APPENDIX B-2B
VOCs in Groundwater
micrograms per liter (µg/L)

theta hat (KM)	3.528	theta star (KM)	3.559
80% gamma percentile (KM)	1.991	90% gamma percentile (KM)	3.622
95% gamma percentile (KM)	5.446	99% gamma percentile (KM)	10.1

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (91.73, α)	70.64	Adjusted Chi Square Value (91.73, β)	70.43
95% Gamma Approximate KM-UCL (use when n>=50)	1.63	95% Gamma Adjusted KM-UCL (use when n<50)	1.635

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.947	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.947	Detected Data Not Lognormal at 5% Significance Leve	
Lilliefors Test Statistic	0.106	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.126	Detected Data appear Lognormal at 5% Significance Leve	

Detected Data appear Approximate Lognormal at 5% Significance Leve

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	1.329	Mean in Log Scale	-0.888
SD in Original Scale	2.078	SD in Log Scale	1.648
95% t UCL (assumes normality of ROS data)	1.631	95% Percentile Bootstrap UCL	1.642
95% BCA Bootstrap UCL	1.684	95% Bootstrap t UCL	1.687
95% H-UCL (Log ROS)	2.42		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distributior

KM Mean (logged)	-1.081	KM Geo Mean	0.339
KM SD (logged)	1.558	95% Critical H Value (KM-Log)	2.754
KM Standard Error of Mean (logged)	0.138	95% H-UCL (KM -Log)	1.666
KM SD (logged)	1.558	95% Critical H Value (KM-Log)	2.754
KM Standard Error of Mean (logged)	0.138		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	1.26	Mean in Log Scale	-1.064
SD in Original Scale	2.111	SD in Log Scale	1.567
95% t UCL (Assumes normality)	1.566	95% H-Stat UCL	1.723

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Detected Data appear Gamma Distributed at 5% Significance Leve

Suggested UCL to Use

95% KM Approximate Gamma UCL	1.63	95% GROS Approximate Gamma UCL	1.629

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
Recommendations are based upon data size, data distribution, and skewness
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statisticiar

APPENDIX B-2B
VOCs in Groundwater
micrograms per liter (µg/L)

Naphthalene

General Statistics

Total Number of Observations	130	Number of Distinct Observations	13
Number of Detects	12	Number of Non-Detects	118
Number of Distinct Detects	11	Number of Distinct Non-Detects	2
Minimum Detect	0.43	Minimum Non-Detect	0.22
Maximum Detect	45	Maximum Non-Detect	0.4
Variance Detects	170.1	Percent Non-Detects	90.77%
Mean Detects	7.525	SD Detects	13.04
Median Detects	1.49	CV Detects	1.733
Skewness Detects	2.534	Kurtosis Detects	6.858
Mean of Logged Detects	0.796	SD of Logged Detects	1.621

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.621	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.859	Detected Data Not Normal at 5% Significance Leve	
Lilliefors Test Statistic	0.325	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.243	Detected Data Not Normal at 5% Significance Leve	
Detected Data Not Normal at 5% Significance Leve			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.894	KM Standard Error of Mean	0.398
KM SD	4.343	95% KM (BCA) UCL	1.563
95% KM (t) UCL	1.553	95% KM (Percentile Bootstrap) UCL	1.586
95% KM (z) UCL	1.549	95% KM Bootstrap t UCL	3.001
90% KM Chebyshev UCL	2.088	95% KM Chebyshev UCL	2.629
97.5% KM Chebyshev UCL	3.379	99% KM Chebyshev UCL	4.853

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.879	Anderson-Darling GOF Test	
5% A-D Critical Value	0.784	Detected Data Not Gamma Distributed at 5% Significance Leve	
K-S Test Statistic	0.263	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.258	Detected Data Not Gamma Distributed at 5% Significance Leve	
Detected Data Not Gamma Distributed at 5% Significance Leve			

Gamma Statistics on Detected Data Only

k hat (MLE)	0.517	k star (bias corrected MLE)	0.443
Theta hat (MLE)	14.55	Theta star (bias corrected MLE)	16.97
nu hat (MLE)	12.41	nu star (bias corrected)	10.64
Mean (detects)	7.525		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.704
Maximum	45	Median	0.01
SD	4.39	CV	6.239
k hat (MLE)	0.197	k star (bias corrected MLE)	0.197
Theta hat (MLE)	3.581	Theta star (bias corrected MLE)	3.57
nu hat (MLE)	51.09	nu star (bias corrected)	51.25
Adjusted Level of Significance (β)	0.0482		
Approximate Chi Square Value (51.25, α)	35.81	Adjusted Chi Square Value (51.25, β)	35.66
95% Gamma Approximate UCL (use when n>=50)	1.007	95% Gamma Adjusted UCL (use when n<50)	1.011

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.894	SD (KM)	4.343
Variance (KM)	18.86	SE of Mean (KM)	39.80%
k hat (KM)	0.0424	k star (KM)	0.0465
nu hat (KM)	11.02	nu star (KM)	12.1

APPENDIX B-2B
VOCs in Groundwater
micrograms per liter (µg/L)

theta hat (KM)	21.09	theta star (KM)	19.21
80% gamma percentile (KM)	0.0931	90% gamma percentile (KM)	1.237
95% gamma percentile (KM)	4.625	99% gamma percentile (KM)	20

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (12.10, α)	5.294	Adjusted Chi Square Value (12.10, β)	5.244
95% Gamma Approximate KM-UCL (use when n>=50)	2.044	95% Gamma Adjusted KM-UCL (use when n<50)	2.064

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.883	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.859	Detected Data appear Lognormal at 5% Significance Leve	
Lilliefors Test Statistic	0.216	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.243	Detected Data appear Lognormal at 5% Significance Leve	
Detected Data appear Lognormal at 5% Significance Leve			

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.705	Mean in Log Scale	-7.621
SD in Original Scale	4.39	SD in Log Scale	4.634
95% t UCL (assumes normality of ROS data)	1.343	95% Percentile Bootstrap UCL	1.422
95% BCA Bootstrap UCL	1.802	95% Bootstrap t UCL	3.121
95% H-UCL (Log ROS)	346.4		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distributior

KM Mean (logged)	-1.301	KM Geo Mean	0.272
KM SD (logged)	0.818	95% Critical H Value (KM-Log)	2.038
KM Standard Error of Mean (logged)	0.075	95% H-UCL (KM -Log)	0.441
KM SD (logged)	0.818	95% Critical H Value (KM-Log)	2.038
KM Standard Error of Mean (logged)	0.075		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.865	Mean in Log Scale	-1.461
SD in Original Scale	4.365	SD in Log Scale	0.886
95% t UCL (Assumes normality)	1.50E+00	95% H-Stat UCL	0.404

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Detected Data appear Lognormal Distributed at 5% Significance Leve

Suggested UCL to Use

KM H-UCL	0.441

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
Recommendations are based upon data size, data distribution, and skewness
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statisticiar

APPENDIX B-2B
VOCs in Groundwater
micrograms per liter (µg/L)

n-Butylbenzene

General Statistics

Total Number of Observations	129	Number of Distinct Observations	6
Number of Detects	5	Number of Non-Detects	124
Number of Distinct Detects	4	Number of Distinct Non-Detects	2
Minimum Detect	0.48	Minimum Non-Detect	0.3
Maximum Detect	1.1	Maximum Non-Detect	0.4
Variance Detects	0.0705	Percent Non-Detects	96.12%
Mean Detects	0.662	SD Detects	0.266
Median Detects	0.5	CV Detects	0.401
Skewness Detects	1.553	Kurtosis Detects	1.878
Mean of Logged Detects	-0.468	SD of Logged Detects	0.358

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.775	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.762	Detected Data appear Normal at 5% Significance Leve	
Lilliefors Test Statistic	0.329	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.343	Detected Data appear Normal at 5% Significance Leve	
Detected Data appear Normal at 5% Significance Leve			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.314	KM Standard Error of Mean	0.00828
KM SD	0.0841	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.328	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.328	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.339	95% KM Chebyshev UCL	0.35
97.5% KM Chebyshev UCL	0.366	99% KM Chebyshev UCL	0.396

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.626	Anderson-Darling GOF Test	
5% A-D Critical Value	0.679	Detected data appear Gamma Distributed at 5% Significance Leve	
K-S Test Statistic	0.358	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.358	Detected Data Not Gamma Distributed at 5% Significance Leve	
Detected data follow Appr. Gamma Distribution at 5% Significance Leve			

Gamma Statistics on Detected Data Only

k hat (MLE)	9.182	k star (bias corrected MLE)	3.806
Theta hat (MLE)	0.0721	Theta star (bias corrected MLE)	0.174
nu hat (MLE)	91.82	nu star (bias corrected)	38.06
Mean (detects)	0.662		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.0388
Maximum	1.1	Median	0.01
SD	0.136	CV	3.512
k hat (MLE)	0.555	k star (bias corrected MLE)	0.548
Theta hat (MLE)	0.0698	Theta star (bias corrected MLE)	0.0708
nu hat (MLE)	143.3	nu star (bias corrected)	141.3
Adjusted Level of Significance (β)	0.0481		
Approximate Chi Square Value (141.29, α)	114.8	Adjusted Chi Square Value (141.29, β)	114.6
95% Gamma Approximate UCL (use when n>=50)	0.0477	95% Gamma Adjusted UCL (use when n<50)	0.0478

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.314	SD (KM)	0.0841
Variance (KM)	0.00707	SE of Mean (KM)	0.00828
k hat (KM)	13.95	k star (KM)	13.63
nu hat (KM)	3599	nu star (KM)	3517

APPENDIX B-2B
VOCs in Groundwater
micrograms per liter (µg/L)

theta hat (KM)	0.0225	theta star (KM)	0.023
80% gamma percentile (KM)	0.382	90% gamma percentile (KM)	0.427
95% gamma percentile (KM)	0.466	99% gamma percentile (KM)	0.545

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (N/A, α)	3380	Adjusted Chi Square Value (N/A, β)	3379
95% Gamma Approximate KM-UCL (use when n>=50)	0.327	95% Gamma Adjusted KM-UCL (use when n<50)	0.327

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.805	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.762	Detected Data appear Lognormal at 5% Significance Leve	
Lilliefors Test Statistic	0.335	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.343	Detected Data appear Lognormal at 5% Significance Leve	
Detected Data appear Lognormal at 5% Significance Leve			

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.0815	Mean in Log Scale	-3.36
SD in Original Scale	0.142	SD in Log Scale	1.321
95% t UCL (assumes normality of ROS data)	0.102	95% Percentile Bootstrap UCL	0.103
95% BCA Bootstrap UCL	0.109	95% Bootstrap t UCL	0.111
95% H-UCL (Log ROS)	0.111		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distributior

KM Mean (logged)	-1.175	KM Geo Mean	0.309
KM SD (logged)	0.155	95% Critical H Value (KM-Log)	1.682
KM Standard Error of Mean (logged)	0.0153	95% H-UCL (KM -Log)	0.32
KM SD (logged)	0.155	95% Critical H Value (KM-Log)	1.682
KM Standard Error of Mean (logged)	0.0153		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.212	Mean in Log Scale	-1.601
SD in Original Scale	0.104	SD in Log Scale	0.255
95% t UCL (Assumes normality)	0.227	95% H-Stat UCL	0.217

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Detected Data appear Normal Distributed at 5% Significance Leve

Suggested UCL to Use

95% KM (t) UCL	0.328

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
Recommendations are based upon data size, data distribution, and skewness
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statisticiar

APPENDIX B-2B
VOCs in Groundwater
micrograms per liter (µg/L)

n-Propylbenzene

General Statistics

Total Number of Observations	130	Number of Distinct Observations	10
Number of Detects	10	Number of Non-Detects	120
Number of Distinct Detects	9	Number of Distinct Non-Detects	2
Minimum Detect	0.25	Minimum Non-Detect	0.2
Maximum Detect	1.7	Maximum Non-Detect	0.25
Variance Detects	0.346	Percent Non-Detects	92.31%
Mean Detects	0.977	SD Detects	0.588
Median Detects	0.99	CV Detects	0.602
Skewness Detects	0.0675	Kurtosis Detects	-1.955
Mean of Logged Detects	-0.233	SD of Logged Detects	0.727

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.872	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.842	Detected Data appear Normal at 5% Significance Leve	
Lilliefors Test Statistic	0.201	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.262	Detected Data appear Normal at 5% Significance Leve	
Detected Data appear Normal at 5% Significance Leve			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.26	KM Standard Error of Mean	0.0239
KM SD	0.259	95% KM (BCA) UCL	0.298
95% KM (t) UCL	0.299	95% KM (Percentile Bootstrap) UCL	0.299
95% KM (z) UCL	0.299	95% KM Bootstrap t UCL	0.32
90% KM Chebyshev UCL	0.331	95% KM Chebyshev UCL	0.364
97.5% KM Chebyshev UCL	0.409	99% KM Chebyshev UCL	0.498

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.538	Anderson-Darling GOF Test	
5% A-D Critical Value	0.734	Detected data appear Gamma Distributed at 5% Significance Leve	
K-S Test Statistic	0.208	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.269	Detected data appear Gamma Distributed at 5% Significance Leve	
Detected data appear Gamma Distributed at 5% Significance Leve			

Gamma Statistics on Detected Data Only

k hat (MLE)	2.533	k star (bias corrected MLE)	1.84
Theta hat (MLE)	0.386	Theta star (bias corrected MLE)	0.531
nu hat (MLE)	50.67	nu star (bias corrected)	36.8
Mean (detects)	0.977		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.0875
Maximum	1.7	Median	0.01
SD	0.302	CV	345.00%
k hat (MLE)	0.375	k star (bias corrected MLE)	0.371
Theta hat (MLE)	0.233	Theta star (bias corrected MLE)	0.236
nu hat (MLE)	97.49	nu star (bias corrected)	96.58
Adjusted Level of Significance (β)	0.0482		
Approximate Chi Square Value (96.58, α)	74.91	Adjusted Chi Square Value (96.58, β)	74.69
95% Gamma Approximate UCL (use when n>=50)	0.113	95% Gamma Adjusted UCL (use when n<50)	0.113

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.26	SD (KM)	0.259
Variance (KM)	0.0668	SE of Mean (KM)	0.0239
k hat (KM)	1.01	k star (KM)	0.991
nu hat (KM)	262.5	nu star (KM)	257.8

APPENDIX B-2B
VOCs in Groundwater
micrograms per liter (µg/L)

theta hat (KM)	0.257	theta star (KM)	0.262
80% gamma percentile (KM)	0.418	90% gamma percentile (KM)	0.599
95% gamma percentile (KM)	0.781	99% gamma percentile (KM)	1.202

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (257.76, α)	221.6	Adjusted Chi Square Value (257.76, β)	221.2
95% Gamma Approximate KM-UCL (use when n>=50)	0.302	95% Gamma Adjusted KM-UCL (use when n<50)	0.303

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.884	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.842	Detected Data appear Lognormal at 5% Significance Leve	
Lilliefors Test Statistic	0.216	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.262	Detected Data appear Lognormal at 5% Significance Leve	
Detected Data appear Lognormal at 5% Significance Leve			

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.113	Mean in Log Scale	-4.018
SD in Original Scale	0.3	SD in Log Scale	1.994
95% t UCL (assumes normality of ROS data)	0.156	95% Percentile Bootstrap UCL	0.158
95% BCA Bootstrap UCL	0.167	95% Bootstrap t UCL	0.174
95% H-UCL (Log ROS)	0.233		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distributior

KM Mean (logged)	-1.504	KM Geo Mean	0.222
KM SD (logged)	0.414	95% Critical H Value (KM-Log)	1.779
KM Standard Error of Mean (logged)	0.0382	95% H-UCL (KM -Log)	0.258
KM SD (logged)	0.414	95% Critical H Value (KM-Log)	1.779
KM Standard Error of Mean (logged)	0.0382		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.187	Mean in Log Scale	-1.965
SD in Original Scale	0.277	SD in Log Scale	0.542
95% t UCL (Assumes normality)	0.228	95% H-Stat UCL	0.177

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Detected Data appear Normal Distributed at 5% Significance Leve

Suggested UCL to Use

95% KM (t) UCL	0.299

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
Recommendations are based upon data size, data distribution, and skewness
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statisticiar

APPENDIX B-2B
VOCs in Groundwater
micrograms per liter (µg/L)

sec-Butylbenzene

General Statistics

Total Number of Observations	128	Number of Distinct Observations	6
Number of Detects	5	Number of Non-Detects	123
Number of Distinct Detects	4	Number of Distinct Non-Detects	2
Minimum Detect	0.28	Minimum Non-Detect	0.17
Maximum Detect	0.68	Maximum Non-Detect	0.25
Variance Detects	0.0201	Percent Non-Detects	96.09%
Mean Detects	0.488	SD Detects	0.142
Median Detects	0.49	CV Detects	0.29
Skewness Detects	-0.281	Kurtosis Detects	2.026
Mean of Logged Detects	-0.756	SD of Logged Detects	0.321

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.896	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.762	Detected Data appear Normal at 5% Significance Leve	
Lilliefors Test Statistic	0.306	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.343	Detected Data appear Normal at 5% Significance Leve	
Detected Data appear Normal at 5% Significance Leve			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.182	KM Standard Error of Mean	0.00657
KM SD	0.0665	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.193	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.193	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.202	95% KM Chebyshev UCL	0.211
97.5% KM Chebyshev UCL	0.223	99% KM Chebyshev UCL	0.248

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.518	Anderson-Darling GOF Test	
5% A-D Critical Value	0.679	Detected data appear Gamma Distributed at 5% Significance Leve	
K-S Test Statistic	0.342	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.357	Detected data appear Gamma Distributed at 5% Significance Leve	
Detected data appear Gamma Distributed at 5% Significance Leve			

Gamma Statistics on Detected Data Only

k hat (MLE)	13.23	k star (bias corrected MLE)	5.427
Theta hat (MLE)	0.0369	Theta star (bias corrected MLE)	0.0899
nu hat (MLE)	132.3	nu star (bias corrected)	54.27
Mean (detects)	0.488		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.0394
Maximum	0.68	Median	0.01
SD	0.103	CV	2.605
k hat (MLE)	0.611	k star (bias corrected MLE)	0.602
Theta hat (MLE)	0.0646	Theta star (bias corrected MLE)	0.0655
nu hat (MLE)	156.3	nu star (bias corrected)	154
Adjusted Level of Significance (β)	0.0481		
Approximate Chi Square Value (154.00, α)	126.3	Adjusted Chi Square Value (154.00, β)	126
95% Gamma Approximate UCL (use when n>=50)	0.0481	95% Gamma Adjusted UCL (use when n<50)	0.0482

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.182	SD (KM)	0.0665
Variance (KM)	0.00442	SE of Mean (KM)	0.00657
k hat (KM)	7.524	k star (KM)	7.353
nu hat (KM)	1926	nu star (KM)	1882

APPENDIX B-2B
VOCs in Groundwater
micrograms per liter (µg/L)

theta hat (KM)	0.0242	theta star (KM)	0.0248
80% gamma percentile (KM)	0.235	90% gamma percentile (KM)	0.272
95% gamma percentile (KM)	0.305	99% gamma percentile (KM)	0.374

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (N/A, α)	1782	Adjusted Chi Square Value (N/A, β)	1781
95% Gamma Approximate KM-UCL (use when n>=50)	0.193	95% Gamma Adjusted KM-UCL (use when n<50)	0.193

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.858	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.762	Detected Data appear Lognormal at 5% Significance Leve	
Lilliefors Test Statistic	0.352	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.343	Detected Data Not Lognormal at 5% Significance Leve	

Detected Data appear Approximate Lognormal at 5% Significance Leve

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.0824	Mean in Log Scale	-3.032
SD in Original Scale	0.104	SD in Log Scale	1.042
95% t UCL (assumes normality of ROS data)	0.0977	95% Percentile Bootstrap UCL	0.0982
95% BCA Bootstrap UCL	0.102	95% Bootstrap t UCL	0.102
95% H-UCL (Log ROS)	0.102		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distributior

KM Mean (logged)	-1.732	KM Geo Mean	0.177
KM SD (logged)	0.205	95% Critical H Value (KM-Log)	1.695
KM Standard Error of Mean (logged)	0.0202	95% H-UCL (KM -Log)	0.186
KM SD (logged)	0.205	95% Critical H Value (KM-Log)	1.695
KM Standard Error of Mean (logged)	0.0202		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.134	Mean in Log Scale	-2.076
SD in Original Scale	0.077	SD in Log Scale	0.302
95% t UCL (Assumes normality)	0.145	95% H-Stat UCL	13.70%

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Detected Data appear Normal Distributed at 5% Significance Leve

Suggested UCL to Use

95% KM (t) UCL	0.193

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
Recommendations are based upon data size, data distribution, and skewness
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statisticiar

APPENDIX B-2B
VOCs in Groundwater
micrograms per liter (µg/L)

Styrene

General Statistics

Total Number of Observations	128	Number of Distinct Observations	3
Number of Detects	1	Number of Non-Detects	127
Number of Distinct Detects	1	Number of Distinct Non-Detects	2

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set
It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV)

The data set for variable D was not processed!

APPENDIX B-2B
VOCs in Groundwater
micrograms per liter (µg/L)

tert-Butylbenzene

General Statistics

Total Number of Observations	129	Number of Distinct Observations	2
Number of Detects	0	Number of Non-Detects	129
Number of Distinct Detects	0	Number of Distinct Non-Detects	2

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV)

The data set for variable E was not processed!

APPENDIX B-2B
VOCs in Groundwater
micrograms per liter (µg/L)

Tetrachloroethene (PCE)

General Statistics

Total Number of Observations	129	Number of Distinct Observations	6
Number of Detects	4	Number of Non-Detects	125
Number of Distinct Detects	4	Number of Distinct Non-Detects	2
Minimum Detect	0.66	Minimum Non-Detect	0.2
Maximum Detect	0.98	Maximum Non-Detect	0.25
Variance Detects	0.0277	Percent Non-Detects	96.90%
Mean Detects	0.833	SD Detects	0.166
Median Detects	0.845	CV Detects	0.2
Skewness Detects	-0.108	Kurtosis Detects	-5.343
Mean of Logged Detects	-0.199	SD of Logged Detects	0.203

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.825	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Normal at 5% Significance Leve	
Lilliefors Test Statistic	0.296	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.375	Detected Data appear Normal at 5% Significance Leve	
Detected Data appear Normal at 5% Significance Leve			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.22	KM Standard Error of Mean	0.0114
KM SD	0.113	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.239	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.238	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.254	95% KM Chebyshev UCL	0.269
97.5% KM Chebyshev UCL	0.291	99% KM Chebyshev UCL	0.333

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.514	Anderson-Darling GOF Test	
5% A-D Critical Value	0.657	Detected data appear Gamma Distributed at 5% Significance Leve	
K-S Test Statistic	0.33	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.394	Detected data appear Gamma Distributed at 5% Significance Leve	
Detected data appear Gamma Distributed at 5% Significance Leve			

Gamma Statistics on Detected Data Only

k hat (MLE)	32.74	k star (bias corrected MLE)	835.20%
Theta hat (MLE)	0.0254	Theta star (bias corrected MLE)	0.0997
nu hat (MLE)	261.9	nu star (bias corrected)	66.82
Mean (detects)	0.833		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.0725
Maximum	0.98	Median	0.01
SD	0.173	CV	2.388
k hat (MLE)	0.468	k star (bias corrected MLE)	0.462
Theta hat (MLE)	0.155	Theta star (bias corrected MLE)	0.157
nu hat (MLE)	120.8	nu star (bias corrected)	119.3
Adjusted Level of Significance (β)	0.0481		
Approximate Chi Square Value (119.29, α)	95.07	Adjusted Chi Square Value (119.29, β)	94.82
95% Gamma Approximate UCL (use when n>=50)	0.091	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.22	SD (KM)	0.113
Variance (KM)	0.0127	SE of Mean (KM)	0.0114
k hat (KM)	3.808	k star (KM)	3.725
nu hat (KM)	982.6	nu star (KM)	961

APPENDIX B-2B
VOCs in Groundwater
micrograms per liter (µg/L)

theta hat (KM)	0.0577	theta star (KM)	0.059
80% gamma percentile (KM)	0.305	90% gamma percentile (KM)	0.372
95% gamma percentile (KM)	0.434	99% gamma percentile (KM)	0.566

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (961.04, α)	890.1	Adjusted Chi Square Value (961.04, β)	889.3
95% Gamma Approximate KM-UCL (use when n>=50)	0.237	95% Gamma Adjusted KM-UCL (use when n<50)	0.237

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.834	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Lognormal at 5% Significance Leve	
Lilliefors Test Statistic	0.296	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.375	Detected Data appear Lognormal at 5% Significance Leve	
Detected Data appear Lognormal at 5% Significance Leve			

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.194	Mean in Log Scale	-1.928
SD in Original Scale	0.166	SD in Log Scale	0.76
95% t UCL (assumes normality of ROS data)	0.218	95% Percentile Bootstrap UCL	0.219
95% BCA Bootstrap UCL	0.221	95% Bootstrap t UCL	0.222
95% H-UCL (Log ROS)	0.222		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distributior

KM Mean (logged)	-1.566	KM Geo Mean	0.209
KM SD (logged)	0.246	95% Critical H Value (KM-Log)	1.709
KM Standard Error of Mean (logged)	0.0251	95% H-UCL (KM -Log)	0.224
KM SD (logged)	0.246	95% Critical H Value (KM-Log)	1.709
KM Standard Error of Mean (logged)	0.0251		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.144	Mean in Log Scale	-2.047
SD in Original Scale	0.126	SD in Log Scale	0.341
95% t UCL (Assumes normality)	0.162	95% H-Stat UCL	0.144

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Detected Data appear Normal Distributed at 5% Significance Leve

Suggested UCL to Use

95% KM (t) UCL	0.239

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
Recommendations are based upon data size, data distribution, and skewness
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statisticiar

APPENDIX B-2B
VOCs in Groundwater
micrograms per liter (µg/L)

Toluene

General Statistics

Total Number of Observations	129	Number of Distinct Observations	20
Number of Detects	20	Number of Non-Detects	109
Number of Distinct Detects	18	Number of Distinct Non-Detects	200.00%
Minimum Detect	0.26	Minimum Non-Detect	0.17
Maximum Detect	15	Maximum Non-Detect	0.25
Variance Detects	10.75	Percent Non-Detects	84.50%
Mean Detects	1.388	SD Detects	3.278
Median Detects	0.425	CV Detects	2.362
Skewness Detects	4.176	Kurtosis Detects	17.96
Mean of Logged Detects	-0.495	SD of Logged Detects	0.986

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.359	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.905	Detected Data Not Normal at 5% Significance Leve	
Lilliefors Test Statistic	0.423	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.192	Detected Data Not Normal at 5% Significance Leve	
Detected Data Not Normal at 5% Significance Leve			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.359	KM Standard Error of Mean	0.12
KM SD	1.333	95% KM (BCA) UCL	0.616
95% KM (t) UCL	0.558	95% KM (Percentile Bootstrap) UCL	0.581
95% KM (z) UCL	0.557	95% KM Bootstrap t UCL	1.641
90% KM Chebyshev UCL	0.72	95% KM Chebyshev UCL	0.884
97.5% KM Chebyshev UCL	1.111	99% KM Chebyshev UCL	1.557

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	3.083	Anderson-Darling GOF Test	
5% A-D Critical Value	0.781	Detected Data Not Gamma Distributed at 5% Significance Leve	
K-S Test Statistic	0.317	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.202	Detected Data Not Gamma Distributed at 5% Significance Leve	
Detected Data Not Gamma Distributed at 5% Significance Leve			

Gamma Statistics on Detected Data Only

k hat (MLE)	0.73	k star (bias corrected MLE)	0.654
Theta hat (MLE)	1.902	Theta star (bias corrected MLE)	2.123
nu hat (MLE)	29.19	nu star (bias corrected)	26.15
Mean (detects)	1.388		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.224
Maximum	15	Median	0.01
SD	1.359	CV	6.075
k hat (MLE)	0.282	k star (bias corrected MLE)	0.281
Theta hat (MLE)	0.793	Theta star (bias corrected MLE)	0.797
nu hat (MLE)	72.75	nu star (bias corrected)	72.39
Adjusted Level of Significance (β)	0.0481		
Approximate Chi Square Value (72.39, α)	53.8	Adjusted Chi Square Value (72.39, β)	53.62
95% Gamma Approximate UCL (use when n>=50)	0.301	95% Gamma Adjusted UCL (use when n<50)	0.302

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.359	SD (KM)	1.333
Variance (KM)	1.777	SE of Mean (KM)	0.12
k hat (KM)	0.0725	k star (KM)	0.0759
nu hat (KM)	18.69	nu star (KM)	19.59

APPENDIX B-2B
VOCs in Groundwater
micrograms per liter (µg/L)

theta hat (KM)	4.952	theta star (KM)	4.725
80% gamma percentile (KM)	0.154	90% gamma percentile (KM)	0.822
95% gamma percentile (KM)	2.08	99% gamma percentile (KM)	6.513

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (19.59, α)	10.55	Adjusted Chi Square Value (19.59, β)	10.48
95% Gamma Approximate KM-UCL (use when n>=50)	0.666	95% Gamma Adjusted KM-UCL (use when n<50)	0.671

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.762	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.905	Detected Data Not Lognormal at 5% Significance Leve	
Lilliefors Test Statistic	0.194	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.192	Detected Data Not Lognormal at 5% Significance Leve	
Detected Data Not Lognormal at 5% Significance Leve			

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.238	Mean in Log Scale	-4.123
SD in Original Scale	1.357	SD in Log Scale	2.328
95% t UCL (assumes normality of ROS data)	0.436	95% Percentile Bootstrap UCL	0.449
95% BCA Bootstrap UCL	0.657	95% Bootstrap t UCL	1.303
95% H-UCL (Log ROS)	0.517		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distributior

KM Mean (logged)	-1.574	KM Geo Mean	0.207
KM SD (logged)	0.597	95% Critical H Value (KM-Log)	1.882
KM Standard Error of Mean (logged)	0.0539	95% H-UCL (KM -Log)	0.273
KM SD (logged)	0.597	95% Critical H Value (KM-Log)	1.882
KM Standard Error of Mean (logged)	0.0539		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.316	Mean in Log Scale	-1.882
SD in Original Scale	1.345	SD in Log Scale	0.718
95% t UCL (Assumes normality)	0.512	95% H-Stat UCL	0.223

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Data do not follow a Discernible Distribution at 5% Significance Leve

Suggested UCL to Use

95% KM (Chebyshev) UCL	0.884

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
Recommendations are based upon data size, data distribution, and skewness
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statisticiar

APPENDIX B-2B
VOCs in Groundwater
micrograms per liter (µg/L)

trans-1,2-Dichloroethene

General Statistics

Total Number of Observations	128	Number of Distinct Observations	3
Number of Detects	1	Number of Non-Detects	127
Number of Distinct Detects	1	Number of Distinct Non-Detects	2

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set
It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV)

The data set for variable H was not processed!

APPENDIX B-2B
VOCs in Groundwater
micrograms per liter (µg/L)

trans-1,3-Dichloropropene

General Statistics

Total Number of Observations	128	Number of Distinct Observations	2
Number of Detects	0	Number of Non-Detects	128
Number of Distinct Detects	0	Number of Distinct Non-Detects	2

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV)

The data set for variable I was not processed!

APPENDIX B-2B
VOCs in Groundwater
micrograms per liter (µg/L)

Trichloroethene (TCE)

General Statistics

Total Number of Observations	129	Number of Distinct Observations	8
Number of Detects	6	Number of Non-Detects	123
Number of Distinct Detects	6	Number of Distinct Non-Detects	2
Minimum Detect	0.34	Minimum Non-Detect	0.2
Maximum Detect	6.1	Maximum Non-Detect	0.25
Variance Detects	5.03	Percent Non-Detects	95.35%
Mean Detects	1.54	SD Detects	2.243
Median Detects	0.665	CV Detects	1.456
Skewness Detects	2.406	Kurtosis Detects	5.834
Mean of Logged Detects	-0.132	SD of Logged Detects	1.01

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.582	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.788	Detected Data Not Normal at 5% Significance Leve	
Lilliefors Test Statistic	0.442	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.325	Detected Data Not Normal at 5% Significance Leve	
Detected Data Not Normal at 5% Significance Leve			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.262	KM Standard Error of Mean	0.0505
KM SD	0.524	95% KM (BCA) UCL	0.354
95% KM (t) UCL	0.346	95% KM (Percentile Bootstrap) UCL	0.354
95% KM (z) UCL	0.345	95% KM Bootstrap t UCL	0.583
90% KM Chebyshev UCL	0.414	95% KM Chebyshev UCL	0.483
97.5% KM Chebyshev UCL	0.578	99% KM Chebyshev UCL	0.765

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.939	Anderson-Darling GOF Test	
5% A-D Critical Value	0.715	Detected Data Not Gamma Distributed at 5% Significance Leve	
K-S Test Statistic	0.387	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.341	Detected Data Not Gamma Distributed at 5% Significance Leve	
Detected Data Not Gamma Distributed at 5% Significance Leve			

Gamma Statistics on Detected Data Only

k hat (MLE)	1.021	k star (bias corrected MLE)	0.622
Theta hat (MLE)	1.508	Theta star (bias corrected MLE)	2.477
nu hat (MLE)	12.25	nu star (bias corrected)	7.46
Mean (detects)	1.54		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.0812
Maximum	6.1	Median	0.01
SD	0.549	CV	6.761
k hat (MLE)	0.356	k star (bias corrected MLE)	0.353
Theta hat (MLE)	0.228	Theta star (bias corrected MLE)	0.23
nu hat (MLE)	91.76	nu star (bias corrected)	90.96
Adjusted Level of Significance (β)	0.0481		
Approximate Chi Square Value (90.96, α)	69.97	Adjusted Chi Square Value (90.96, β)	69.76
95% Gamma Approximate UCL (use when n>=50)	0.106	95% Gamma Adjusted UCL (use when n<50)	0.106

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.262	SD (KM)	0.524
Variance (KM)	0.275	SE of Mean (KM)	0.0505
k hat (KM)	0.251	k star (KM)	0.25
nu hat (KM)	64.65	nu star (KM)	64.48

APPENDIX B-2B
VOCs in Groundwater
micrograms per liter (µg/L)

theta hat (KM)	1.047	theta star (KM)	1.05
80% gamma percentile (KM)	0.381	90% gamma percentile (KM)	0.787
95% gamma percentile (KM)	1.27	99% gamma percentile (KM)	2.554

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (64.48, α)	47.01	Adjusted Chi Square Value (64.48, β)	46.84
95% Gamma Approximate KM-UCL (use when n>=50)	0.36	95% Gamma Adjusted KM-UCL (use when n<50)	0.361

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.808	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.788	Detected Data appear Lognormal at 5% Significance Leve	
Lilliefors Test Statistic	0.314	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.325	Detected Data appear Lognormal at 5% Significance Leve	
Detected Data appear Lognormal at 5% Significance Leve			

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.0806	Mean in Log Scale	-7.367
SD in Original Scale	0.549	SD in Log Scale	3.42
95% t UCL (assumes normality of ROS data)	0.161	95% Percentile Bootstrap UCL	0.173
95% BCA Bootstrap UCL	0.262	95% Bootstrap t UCL	0.435
95% H-UCL (Log ROS)	1.014		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distributior

KM Mean (logged)	-1.541	KM Geo Mean	0.214
KM SD (logged)	0.369	95% Critical H Value (KM-Log)	1.757
KM Standard Error of Mean (logged)	0.0356	95% H-UCL (KM -Log)	0.243
KM SD (logged)	0.369	95% Critical H Value (KM-Log)	1.757
KM Standard Error of Mean (logged)	0.0356		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.188	Mean in Log Scale	-2.017
SD in Original Scale	0.535	SD in Log Scale	0.469
95% t UCL (Assumes normality)	0.266	95% H-Stat UCL	0.16

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Detected Data appear Lognormal Distributed at 5% Significance Leve

Suggested UCL to Use

KM H-UCL	0.243

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
Recommendations are based upon data size, data distribution, and skewness
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statisticiar

APPENDIX B-2B
VOCs in Groundwater
micrograms per liter (µg/L)

Trichlorofluoromethane

General Statistics

Total Number of Observations	128	Number of Distinct Observations	2
Number of Detects	0	Number of Non-Detects	128
Number of Distinct Detects	0	Number of Distinct Non-Detects	2

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV)

The data set for variable K was not processed!

APPENDIX B-2B
VOCs in Groundwater
micrograms per liter (µg/L)

Vinyl Acetate

General Statistics

Total Number of Observations	128	Number of Distinct Observations	2
Number of Detects	0	Number of Non-Detects	128
Number of Distinct Detects	0	Number of Distinct Non-Detects	2

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV)

The data set for variable L was not processed!

APPENDIX B-2B
VOCs in Groundwater
micrograms per liter (µg/L)

Vinyl Chloride

General Statistics

Total Number of Observations	129	Number of Distinct Observations	5
Number of Detects	3	Number of Non-Detects	126
Number of Distinct Detects	3	Number of Distinct Non-Detects	2
Minimum Detect	0.44	Minimum Non-Detect	0.2
Maximum Detect	9.7	Maximum Non-Detect	0.25
Variance Detects	26.17	Percent Non-Detects	97.67%
Mean Detects	3.813	SD Detects	5.116
Median Detects	1.3	CV Detects	1.342
Skewness Detects	1.677	Kurtosis Detects	N/A
Mean of Logged Detects	0.571	SD of Logged Detects	1.57

Warning: Data set has only 3 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.819	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Normal at 5% Significance Leve	
Lilliefors Test Statistic	0.355	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.425	Detected Data appear Normal at 5% Significance Leve	

Detected Data appear Normal at 5% Significance Leve

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.284	KM Standard Error of Mean	0.0904
KM SD	0.838	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.434	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.433	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.555	95% KM Chebyshev UCL	0.678
97.5% KM Chebyshev UCL	0.848	99% KM Chebyshev UCL	1.183

Gamma GOF Tests on Detected Observations Only
Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	0.777	k star (bias corrected MLE)	N/A
Theta hat (MLE)	4.911	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	4.659	nu star (bias corrected)	N/A
Mean (detects)	3.813		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.0984
Maximum	9.7	Median	0.01
SD	0.86	CV	8.739
k hat (MLE)	0.316	k star (bias corrected MLE)	0.313
Theta hat (MLE)	0.312	Theta star (bias corrected MLE)	0.314
nu hat (MLE)	81.44	nu star (bias corrected)	80.88
Adjusted Level of Significance (β)	0.0481		
Approximate Chi Square Value (80.88, α)	61.15	Adjusted Chi Square Value (80.88, β)	60.96
95% Gamma Approximate UCL (use when n>=50)	0.13	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.284	SD (KM)	0.838
Variance (KM)	0.702	SE of Mean (KM)	0.0904
k hat (KM)	0.115	k star (KM)	0.117
nu hat (KM)	29.63	nu star (KM)	30.28

APPENDIX B-2B
VOCs in Groundwater
micrograms per liter (µg/L)

theta hat (KM)	2.473	theta star (KM)	2.42
80% gamma percentile (KM)	0.243	90% gamma percentile (KM)	0.8
95% gamma percentile (KM)	1.625	99% gamma percentile (KM)	4.159

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (30.28, α)	18.71	Adjusted Chi Square Value (30.28, β)	18.61
95% Gamma Approximate KM-UCL (use when n>=50)	0.46	95% Gamma Adjusted KM-UCL (use when n<50)	0.462

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.971	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Lognormal at 5% Significance Leve	
Lilliefors Test Statistic	0.245	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.425	Detected Data appear Lognormal at 5% Significance Leve	
Detected Data appear Lognormal at 5% Significance Leve			

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.0896	Mean in Log Scale	-16.7
SD in Original Scale	0.861	SD in Log Scale	7.243
95% t UCL (assumes normality of ROS data)	0.215	95% Percentile Bootstrap UCL	0.233
95% BCA Bootstrap UCL	0.332	95% Bootstrap t UCL	2.002
95% H-UCL (Log ROS)	9744687		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distributior

KM Mean (logged)	-1.559	KM Geo Mean	0.21
KM SD (logged)	0.382	95% Critical H Value (KM-Log)	1.763
KM Standard Error of Mean (logged)	0.0412	95% H-UCL (KM -Log)	0.24
KM SD (logged)	0.382	95% Critical H Value (KM-Log)	1.763
KM Standard Error of Mean (logged)	0.0412		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.208	Mean in Log Scale	-2.045
SD in Original Scale	0.849	SD in Log Scale	0.456
95% t UCL (Assumes normality)	0.332	95% H-Stat UCL	0.154

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Detected Data appear Normal Distributed at 5% Significance Leve

Suggested UCL to Use

95% KM (t) UCL	0.434

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
Recommendations are based upon data size, data distribution, and skewness
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statisticiar

APPENDIX B-2B
VOCs in Groundwater
micrograms per liter (µg/L)

Xylenes, Total

General Statistics

Total Number of Observations	129	Number of Distinct Observations	11
Number of Detects	9	Number of Non-Detects	120
Number of Distinct Detects	9	Number of Distinct Non-Detects	2
Minimum Detect	0.57	Minimum Non-Detect	0.4
Maximum Detect	16	Maximum Non-Detect	0.5
Variance Detects	37.64	Percent Non-Detects	93.02%
Mean Detects	4.95	SD Detects	6.135
Median Detects	1.5	CV Detects	1.239
Skewness Detects	1.219	Kurtosis Detects	-0.198
Mean of Logged Detects	0.819	SD of Logged Detects	1.344

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.742	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.829	Detected Data Not Normal at 5% Significance Leve	
Lilliefors Test Statistic	0.328	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.274	Detected Data Not Normal at 5% Significance Leve	
Detected Data Not Normal at 5% Significance Leve			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.717	KM Standard Error of Mean	0.179
KM SD	1.918	95% KM (BCA) UCL	1.044
95% KM (t) UCL	1.014	95% KM (Percentile Bootstrap) UCL	1.027
95% KM (z) UCL	1.012	95% KM Bootstrap t UCL	1.389
90% KM Chebyshev UCL	1.255	95% KM Chebyshev UCL	1.498
97.5% KM Chebyshev UCL	1.836	99% KM Chebyshev UCL	2.499

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.7	Anderson-Darling GOF Test	
5% A-D Critical Value	0.751	Detected data appear Gamma Distributed at 5% Significance Leve	
K-S Test Statistic	0.234	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.289	Detected data appear Gamma Distributed at 5% Significance Leve	
Detected data appear Gamma Distributed at 5% Significance Leve			

Gamma Statistics on Detected Data Only

k hat (MLE)	0.765	k star (bias corrected MLE)	0.584
Theta hat (MLE)	6.472	Theta star (bias corrected MLE)	8.477
nu hat (MLE)	13.77	nu star (bias corrected)	10.51
Mean (detects)	4.95		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.355
Maximum	16	Median	0.01
SD	1.987	CV	5.603
k hat (MLE)	0.226	k star (bias corrected MLE)	0.226
Theta hat (MLE)	1.568	Theta star (bias corrected MLE)	1.568
nu hat (MLE)	58.37	nu star (bias corrected)	58.35
Adjusted Level of Significance (β)	0.0481		
Approximate Chi Square Value (58.35, α)	41.79	Adjusted Chi Square Value (58.35, β)	41.63
95% Gamma Approximate UCL (use when n>=50)	0.495	95% Gamma Adjusted UCL (use when n<50)	0.497

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.717	SD (KM)	1.918
Variance (KM)	3.678	SE of Mean (KM)	0.179
k hat (KM)	0.14	k star (KM)	0.142
nu hat (KM)	36.11	nu star (KM)	36.6

APPENDIX B-2B
VOCs in Groundwater
micrograms per liter (µg/L)

theta hat (KM)	5.127	theta star (KM)	5.057
80% gamma percentile (KM)	0.745	90% gamma percentile (KM)	2.109
95% gamma percentile (KM)	3.99	99% gamma percentile (KM)	9.512

Gamma Kaplan-Meier (KM) Statistics			
Approximate Chi Square Value (36.60, α)	23.75	Adjusted Chi Square Value (36.60, β)	23.64
95% Gamma Approximate KM-UCL (use when n>=50)	1.106	95% Gamma Adjusted KM-UCL (use when n<50)	1.111

Lognormal GOF Test on Detected Observations Only			
Shapiro Wilk Test Statistic	0.867	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.829	Detected Data appear Lognormal at 5% Significance Leve	
Lilliefors Test Statistic	0.176	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.274	Detected Data appear Lognormal at 5% Significance Leve	
Detected Data appear Lognormal at 5% Significance Leve			

Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	0.361	Mean in Log Scale	-7.194
SD in Original Scale	1.987	SD in Log Scale	4.124
95% t UCL (assumes normality of ROS data)	0.65	95% Percentile Bootstrap UCL	0.678
95% BCA Bootstrap UCL	0.799	95% Bootstrap t UCL	1.392
95% H-UCL (Log ROS)	32.94		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distributior			
KM Mean (logged)	-0.795	KM Geo Mean	0.451
KM SD (logged)	0.554	95% Critical H Value (KM-Log)	1.856
KM Standard Error of Mean (logged)	0.0518	95% H-UCL (KM -Log)	0.577
KM SD (logged)	0.554	95% Critical H Value (KM-Log)	1.856
KM Standard Error of Mean (logged)	0.0518		

DL/2 Statistics			
DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.572	Mean in Log Scale	-1.26
SD in Original Scale	1.95	SD in Log Scale	0.667
95% t UCL (Assumes normality)	0.856	95% H-Stat UCL	0.397
DL/2 is not a recommended method, provided for comparisons and historical reasons			

Nonparametric Distribution Free UCL Statistics	
Detected Data appear Gamma Distributed at 5% Significance Leve	
Suggested UCL to Use	
95% KM Approximate Gamma UCL	1.106

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
Recommendations are based upon data size, data distribution, and skewness
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statisticiar

APPENDIX B-2B
VOCs in Groundwater
micrograms per liter (µg/L)

TPH-Gasoline (C4-C12)

General Statistics

Total Number of Observations	132	Number of Distinct Observations	23
Number of Detects	25	Number of Non-Detects	107
Number of Distinct Detects	22	Number of Distinct Non-Detects	3
Minimum Detect	35	Minimum Non-Detect	21
Maximum Detect	2300	Maximum Non-Detect	50
Variance Detects	312983	Percent Non-Detects	81.06%
Mean Detects	371.8	SD Detects	559.4
Median Detects	150	CV Detects	1.505
Skewness Detects	2.409	Kurtosis Detects	5.724
Mean of Logged Detects	5.13	SD of Logged Detects	1.222

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.637	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.918	Detected Data Not Normal at 5% Significance Leve	
Lilliefors Test Statistic	0.318	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.173	Detected Data Not Normal at 5% Significance Leve	
Detected Data Not Normal at 5% Significance Leve			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	87.45	KM Standard Error of Mean	24.46
KM SD	275.3	95% KM (BCA) UCL	129.8
95% KM (t) UCL	128	95% KM (Percentile Bootstrap) UCL	131.4
95% KM (z) UCL	127.7	95% KM Bootstrap t UCL	162.8
90% KM Chebyshev UCL	160.8	95% KM Chebyshev UCL	194.1
97.5% KM Chebyshev UCL	240.2	99% KM Chebyshev UCL	330.8

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	1.302	Anderson-Darling GOF Test	
5% A-D Critical Value	0.783	Detected Data Not Gamma Distributed at 5% Significance Leve	
K-S Test Statistic	0.189	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.181	Detected Data Not Gamma Distributed at 5% Significance Leve	
Detected Data Not Gamma Distributed at 5% Significance Leve			

Gamma Statistics on Detected Data Only

k hat (MLE)	0.758	k star (bias corrected MLE)	0.694
Theta hat (MLE)	490.7	Theta star (bias corrected MLE)	536.2
nu hat (MLE)	37.89	nu star (bias corrected)	34.68
Mean (detects)	371.8		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	70.43
Maximum	2300	Median	0.01
SD	280.6	CV	3.984
k hat (MLE)	0.114	k star (bias corrected MLE)	0.116
Theta hat (MLE)	618.8	Theta star (bias corrected MLE)	605.6
nu hat (MLE)	30.05	nu star (bias corrected)	30.7
Adjusted Level of Significance (β)	0.0482		
Approximate Chi Square Value (30.70, α)	19.05	Adjusted Chi Square Value (30.70, β)	18.94
95% Gamma Approximate UCL (use when n>=50)	113.5	95% Gamma Adjusted UCL (use when n<50)	114.1

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	87.45	SD (KM)	275.3
Variance (KM)	75803	SE of Mean (KM)	24.46
k hat (KM)	0.101	k star (KM)	0.104
nu hat (KM)	26.63	nu star (KM)	27.36

APPENDIX B-2B
VOCs in Groundwater
micrograms per liter (µg/L)

theta hat (KM)	866.8	theta star (KM)	843.7
80% gamma percentile (KM)	63.84	90% gamma percentile (KM)	236.1
95% gamma percentile (KM)	506.4	99% gamma percentile (KM)	1364

Gamma Kaplan-Meier (KM) Statistics			
Approximate Chi Square Value (27.36, α)	16.43	Adjusted Chi Square Value (27.36, β)	16.34
95% Gamma Approximate KM-UCL (use when n>=50)	145.6	95% Gamma Adjusted KM-UCL (use when n<50)	146.5

Lognormal GOF Test on Detected Observations Only			
Shapiro Wilk Test Statistic	0.934	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.918	Detected Data appear Lognormal at 5% Significance Leve	
Lilliefors Test Statistic	0.106	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.173	Detected Data appear Lognormal at 5% Significance Leve	
Detected Data appear Lognormal at 5% Significance Leve			

Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	74.22	Mean in Log Scale	1.015
SD in Original Scale	279.7	SD in Log Scale	2.828
95% t UCL (assumes normality of ROS data)	114.5	95% Percentile Bootstrap UCL	116.2
95% BCA Bootstrap UCL	130.1	95% Bootstrap t UCL	144.5
95% H-UCL (Log ROS)	435.2		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distributior			
KM Mean (logged)	3.44	KM Geo Mean	31.17
KM SD (logged)	0.969	95% Critical H Value (KM-Log)	2.166
KM Standard Error of Mean (logged)	0.0861	95% H-UCL (KM -Log)	59.88
KM SD (logged)	0.969	95% Critical H Value (KM-Log)	2.166
KM Standard Error of Mean (logged)	0.0861		

DL/2 Statistics			
DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	83.82	Mean in Log Scale	3.232
SD in Original Scale	277.3	SD in Log Scale	1.072
95% t UCL (Assumes normality)	123.8	95% H-Stat UCL	55.63
DL/2 is not a recommended method, provided for comparisons and historical reasons			

Nonparametric Distribution Free UCL Statistics	
Detected Data appear Lognormal Distributed at 5% Significance Leve	

Suggested UCL to Use	
KM H-UCL	59.88

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
Recommendations are based upon data size, data distribution, and skewness
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statisticiar

APPENDIX B-2B
VOCs in Groundwater
micrograms per liter (µg/L)

TPH-Diesel (C10-C28)

General Statistics

Total Number of Observations	134	Number of Distinct Observations	72
Number of Detects	114	Number of Non-Detects	20
Number of Distinct Detects	68	Number of Distinct Non-Detects	6
Minimum Detect	99	Minimum Non-Detect	28
Maximum Detect	21000	Maximum Non-Detect	110
Variance Detects	9896600	Percent Non-Detects	14.93%
Mean Detects	1694	SD Detects	3146
Median Detects	360	CV Detects	1.858
Skewness Detects	3.431	Kurtosis Detects	14.69
Mean of Logged Detects	6.366	SD of Logged Detects	1.365

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.562	Normal GOF Test on Detected Observations Only	
5% Shapiro Wilk P Value	0	Detected Data Not Normal at 5% Significance Leve	
Lilliefors Test Statistic	0.313	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.0833	Detected Data Not Normal at 5% Significance Leve	
Detected Data Not Normal at 5% Significance Leve			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	1446	KM Standard Error of Mean	255.9
KM SD	2949	95% KM (BCA) UCL	1915
95% KM (t) UCL	1870	95% KM (Percentile Bootstrap) UCL	1884
95% KM (z) UCL	1867	95% KM Bootstrap t UCL	1981
90% KM Chebyshev UCL	2214	95% KM Chebyshev UCL	2561
97.5% KM Chebyshev UCL	3044	99% KM Chebyshev UCL	3992

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	8.228	Anderson-Darling GOF Test	
5% A-D Critical Value	0.811	Detected Data Not Gamma Distributed at 5% Significance Leve	
K-S Test Statistic	0.212	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.0903	Detected Data Not Gamma Distributed at 5% Significance Leve	
Detected Data Not Gamma Distributed at 5% Significance Leve			

Gamma Statistics on Detected Data Only

k hat (MLE)	0.581	k star (bias corrected MLE)	0.571
Theta hat (MLE)	2916	Theta star (bias corrected MLE)	2964
nu hat (MLE)	132.4	nu star (bias corrected)	130.3
Mean (detects)	1694		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	1441
Maximum	21000	Median	290
SD	2962	CV	2.056
k hat (MLE)	0.275	k star (bias corrected MLE)	0.274
Theta hat (MLE)	5242	Theta star (bias corrected MLE)	5265
nu hat (MLE)	73.66	nu star (bias corrected)	73.35
Adjusted Level of Significance (β)	0.0482		
Approximate Chi Square Value (73.35, α)	54.62	Adjusted Chi Square Value (73.35, β)	54.45
95% Gamma Approximate UCL (use when n>=50)	1935	95% Gamma Adjusted UCL (use when n<50)	1941

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	1446	SD (KM)	2949
Variance (KM)	8694969	SE of Mean (KM)	255.9
k hat (KM)	0.24	k star (KM)	0.24
nu hat (KM)	64.45	nu star (KM)	64.34

APPENDIX B-2B
VOCs in Groundwater
micrograms per liter (µg/L)

theta hat (KM)	6013	theta star (KM)	6023
80% gamma percentile (KM)	2069	90% gamma percentile (KM)	4352
95% gamma percentile (KM)	7084	99% gamma percentile (KM)	14397

Gamma Kaplan-Meier (KM) Statistics			
Approximate Chi Square Value (64.34, α)	46.89	Adjusted Chi Square Value (64.34, β)	46.73
95% Gamma Approximate KM-UCL (use when n>=50)	1984	95% Gamma Adjusted KM-UCL (use when n<50)	1991

Lognormal GOF Test on Detected Observations Only			
Shapiro Wilk Approximate Test Statistic	0.885	Shapiro Wilk GOF Test	
5% Shapiro Wilk P Value	1.05E-12	Detected Data Not Lognormal at 5% Significance Leve	
Lilliefors Test Statistic	0.145	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.0833	Detected Data Not Lognormal at 5% Significance Leve	
Detected Data Not Lognormal at 5% Significance Leve			

Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	1446	Mean in Log Scale	5.915
SD in Original Scale	2960	SD in Log Scale	1.668
95% t UCL (assumes normality of ROS data)	1869	95% Percentile Bootstrap UCL	1895
95% BCA Bootstrap UCL	1955	95% Bootstrap t UCL	2010
95% H-UCL (Log ROS)	2260		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distributior			
KM Mean (logged)	5.932	KM Geo Mean	376.8
KM SD (logged)	1.633	95% Critical H Value (KM-Log)	2.842
KM Standard Error of Mean (logged)	0.143	95% H-UCL (KM -Log)	2137
KM SD (logged)	1.633	95% Critical H Value (KM-Log)	2.842
KM Standard Error of Mean (logged)	0.143		

DL/2 Statistics			
DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	1447	Mean in Log Scale	5.966
SD in Original Scale	2959	SD in Log Scale	1.594
95% t UCL (Assumes normality)	1871	95% H-Stat UCL	2045
DL/2 is not a recommended method, provided for comparisons and historical reasons			

Nonparametric Distribution Free UCL Statistics
Data do not follow a Discernible Distribution at 5% Significance Leve

Suggested UCL to Use
95% KM (Chebyshev) UCL 2561

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
Recommendations are based upon data size, data distribution, and skewness
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statisticiar

APPENDIX B-2B
VOCs in Groundwater
micrograms per liter (µg/L)

TPH-Motor Oil (C24-C36)

General Statistics

Total Number of Observations	134	Number of Distinct Observations	60
Number of Detects	101	Number of Non-Detects	33
Number of Distinct Detects	55	Number of Distinct Non-Detects	9
Minimum Detect	100	Minimum Non-Detect	68
Maximum Detect	9900	Maximum Non-Detect	200
Variance Detects	1982514	Percent Non-Detects	24.63%
Mean Detects	894	SD Detects	1408
Median Detects	300	CV Detects	1.575
Skewness Detects	3.633	Kurtosis Detects	17.86
Mean of Logged Detects	6.056	SD of Logged Detects	1.137

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.597	Normal GOF Test on Detected Observations Only	
5% Shapiro Wilk P Value	0	Detected Data Not Normal at 5% Significance Leve	
Lilliefors Test Statistic	0.286	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.0884	Detected Data Not Normal at 5% Significance Leve	
Detected Data Not Normal at 5% Significance Leve			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	691.1	KM Standard Error of Mean	110
KM SD	1267	95% KM (BCA) UCL	884.3
95% KM (t) UCL	873.3	95% KM (Percentile Bootstrap) UCL	873.9
95% KM (z) UCL	872	95% KM Bootstrap t UCL	939
90% KM Chebyshev UCL	1021	95% KM Chebyshev UCL	1171
97.5% KM Chebyshev UCL	1378	99% KM Chebyshev UCL	1786

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	6.078	Anderson-Darling GOF Test	
5% A-D Critical Value	0.793	Detected Data Not Gamma Distributed at 5% Significance Leve	
K-S Test Statistic	0.192	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.0925	Detected Data Not Gamma Distributed at 5% Significance Leve	
Detected Data Not Gamma Distributed at 5% Significance Leve			

Gamma Statistics on Detected Data Only

k hat (MLE)	0.802	k star (bias corrected MLE)	0.785
Theta hat (MLE)	1115	Theta star (bias corrected MLE)	1139
nu hat (MLE)	162	nu star (bias corrected)	158.5
Mean (detects)	894		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	673.8
Maximum	9900	Median	205
SD	1281	CV	1.901
k hat (MLE)	0.233	k star (bias corrected MLE)	0.233
Theta hat (MLE)	2891	Theta star (bias corrected MLE)	2894
nu hat (MLE)	62.45	nu star (bias corrected)	62.39
Adjusted Level of Significance (β)	0.0482		
Approximate Chi Square Value (62.39, α)	45.22	Adjusted Chi Square Value (62.39, β)	45.06
95% Gamma Approximate UCL (use when n>=50)	929.6	95% Gamma Adjusted UCL (use when n<50)	932.9

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	691.1	SD (KM)	1267
Variance (KM)	1605518	SE of Mean (KM)	110
k hat (KM)	0.297	k star (KM)	0.296
nu hat (KM)	79.72	nu star (KM)	79.27

APPENDIX B-2B
VOCs in Groundwater
micrograms per liter (µg/L)

theta hat (KM)	2323	theta star (KM)	2336
80% gamma percentile (KM)	1056	90% gamma percentile (KM)	2042
95% gamma percentile (KM)	3176	99% gamma percentile (KM)	6128

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (79.27, α)	59.75	Adjusted Chi Square Value (79.27, β)	59.57
95% Gamma Approximate KM-UCL (use when n>=50)	916.7	95% Gamma Adjusted KM-UCL (use when n<50)	919.5

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Approximate Test Statistic	0.889	Shapiro Wilk GOF Test	
5% Shapiro Wilk P Value	2.78E-10	Detected Data Not Lognormal at 5% Significance Leve	
Lilliefors Test Statistic	0.166	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.0884	Detected Data Not Lognormal at 5% Significance Leve	
Detected Data Not Lognormal at 5% Significance Leve			

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	683.2	Mean in Log Scale	5.429
SD in Original Scale	1276	SD in Log Scale	1.503
95% t UCL (assumes normality of ROS data)	865.8	95% Percentile Bootstrap UCL	869.5
95% BCA Bootstrap UCL	907.8	95% Bootstrap t UCL	941.3
95% H-UCL (Log ROS)	1002		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distributior

KM Mean (logged)	5.609	KM Geo Mean	272.9
KM SD (logged)	1.256	95% Critical H Value (KM-Log)	2.439
KM Standard Error of Mean (logged)	0.109	95% H-UCL (KM -Log)	783.8
KM SD (logged)	1.256	95% Critical H Value (KM-Log)	2.439
KM Standard Error of Mean (logged)	0.109		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	686.5	Mean in Log Scale	5.53
SD in Original Scale	1274	SD in Log Scale	1.355
95% t UCL (Assumes normality)	868.8	95% H-Stat UCL	850.6

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Data do not follow a Discernible Distribution at 5% Significance Leve

Suggested UCL to Use
95% KM (Chebyshev) UCL 1171

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL
Recommendations are based upon data size, data distribution, and skewness
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statisticiar

APPENDIX B-2C
SVOCs in Groundwater
micrograms per liter (µg/L)

Acenaphthylene

General Statistics

Total Number of Observations	131	Number of Distinct Observations	32
Number of Detects	16	Number of Non-Detects	115
Number of Distinct Detects	13	Number of Distinct Non-Detects	21
Minimum Detect	0.11	Minimum Non-Detect	0.097
Maximum Detect	0.64	Maximum Non-Detect	25
Variance Detects	0.026	Percent Non-Detects	87.79%
Mean Detects	0.293	SD Detects	0.161
Median Detects	0.265	CV Detects	0.551
Skewness Detects	1.004	Kurtosis Detects	0.312
Mean of Logged Detects	-1.366	SD of Logged Detects	0.541

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.892	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.887	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.175	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.213	Detected Data appear Normal at 5% Significance Level	

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.127	KM Standard Error of Mean	0.00906
KM SD	0.091	95% KM (BCA) UCL	0.143
95% KM (t) UCL	0.142	95% KM (Percentile Bootstrap) UCL	0.143
95% KM (z) UCL	0.142	95% KM Bootstrap t UCL	0.147
90% KM Chebyshev UCL	0.155	95% KM Chebyshev UCL	0.167
97.5% KM Chebyshev UCL	0.184	99% KM Chebyshev UCL	0.217

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.319	Anderson-Darling GOF Test	
5% A-D Critical Value	0.742	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.166	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.216	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	3.815	k star (bias corrected MLE)	3.141
Theta hat (MLE)	0.0767	Theta star (bias corrected MLE)	0.0931
nu hat (MLE)	122.1	nu star (bias corrected)	100.5
Mean (detects)	0.293		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.0502
Maximum	0.64	Median	0.01
SD	0.108	CV	2.155
k hat (MLE)	0.59	k star (bias corrected MLE)	0.582
Theta hat (MLE)	0.0851	Theta star (bias corrected MLE)	0.0863
nu hat (MLE)	154.7	nu star (bias corrected)	152.5
Adjusted Level of Significance (β)	0.0482		
Approximate Chi Square Value (152.45, α)	124.9	Adjusted Chi Square Value (152.45, β)	124.6
95% Gamma Approximate UCL (use when n>=50)	0.0613	95% Gamma Adjusted UCL (use when n<50)	0.0614

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.127	SD (KM)	0.091
Variance (KM)	0.00828	SE of Mean (KM)	0.00906
k hat (KM)	1.957	k star (KM)	1.917
nu hat (KM)	512.6	nu star (KM)	502.2
theta hat (KM)	0.0651	theta star (KM)	0.0664

APPENDIX B-2C
SVOCs in Groundwater
micrograms per liter (µg/L)

80% gamma percentile (KM)	0.192	90% gamma percentile (KM)	0.25
95% gamma percentile (KM)	0.306	99% gamma percentile (KM)	0.431

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (502.24, α)	451.3	Adjusted Chi Square Value (502.24, β)	450.7
95% Gamma Approximate KM-UCL (use when n>=50)	0.142	95% Gamma Adjusted KM-UCL (use when n<50)	0.142

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.959	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.887	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.145	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.213	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.076	Mean in Log Scale	-3.106
SD in Original Scale	0.103	SD in Log Scale	0.991
95% t UCL (assumes normality of ROS data)	0.0908	95% Percentile Bootstrap UCL	0.0911
95% BCA Bootstrap UCL	0.0948	95% Bootstrap t UCL	0.095
95% H-UCL (Log ROS)	0.0886		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-2.179	KM Geo Mean	11.30%
KM SD (logged)	0.403	95% Critical H Value (KM-Log)	1.774
KM Standard Error of Mean (logged)	0.0411	95% H-UCL (KM -Log)	0.131
KM SD (logged)	0.403	95% Critical H Value (KM-Log)	1.774
KM Standard Error of Mean (logged)	0.0411		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.261	Mean in Log Scale	-2.239
SD in Original Scale	1.098	SD in Log Scale	0.993
95% t UCL (Assumes normality)	0.42	95% H-Stat UCL	0.211

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Detected Data appear Normal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL	0.142

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

APPENDIX B-2C
SVOCs in Groundwater
micrograms per liter (µg/L)

Anthracene

General Statistics

Total Number of Observations	131	Number of Distinct Observations	38
Number of Detects	26	Number of Non-Detects	105
Number of Distinct Detects	21	Number of Distinct Non-Detects	21
Minimum Detect	0.11	Minimum Non-Detect	0.097
Maximum Detect	2.2	Maximum Non-Detect	25
Variance Detects	0.437	Percent Non-Detects	80.15%
Mean Detects	0.511	SD Detects	0.661
Median Detects	0.215	CV Detects	1.293
Skewness Detects	2.124	Kurtosis Detects	3.235
Mean of Logged Detects	-1.18	SD of Logged Detects	0.915

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.59	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.92	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.324	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.17	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.185	KM Standard Error of Mean	0.0302
KM SD	0.335	95% KM (BCA) UCL	0.244
95% KM (t) UCL	0.235	95% KM (Percentile Bootstrap) UCL	0.239
95% KM (z) UCL	0.235	95% KM Bootstrap t UCL	0.266
90% KM Chebyshev UCL	0.276	95% KM Chebyshev UCL	0.317
97.5% KM Chebyshev UCL	0.374	99% KM Chebyshev UCL	0.486

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	2.487	Anderson-Darling GOF Test	
5% A-D Critical Value	0.771	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.23	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.176	Detected Data Not Gamma Distributed at 5% Significance Level	

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	1.121	k star (bias corrected MLE)	1.017
Theta hat (MLE)	0.456	Theta star (bias corrected MLE)	0.503
nu hat (MLE)	58.27	nu star (bias corrected)	52.88
Mean (detects)	0.511		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.11
Maximum	2.2	Median	0.01
SD	0.352	CV	3.199
k hat (MLE)	0.388	k star (bias corrected MLE)	0.385
Theta hat (MLE)	0.284	Theta star (bias corrected MLE)	0.286
nu hat (MLE)	101.8	nu star (bias corrected)	100.8
Adjusted Level of Significance (β)	0.0482		
Approximate Chi Square Value (100.79, α)	78.63	Adjusted Chi Square Value (100.79, β)	78.41
95% Gamma Approximate UCL (use when n>=50)	0.141	95% Gamma Adjusted UCL (use when n<50)	0.142

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.185	SD (KM)	0.335
Variance (KM)	0.112	SE of Mean (KM)	0.0302
k hat (KM)	0.305	k star (KM)	0.303
nu hat (KM)	79.95	nu star (KM)	79.45
theta hat (KM)	0.607	theta star (KM)	0.61

APPENDIX B-2C
SVOCs in Groundwater
micrograms per liter (µg/L)

80% gamma percentile (KM)	0.285	90% gamma percentile (KM)	0.545
95% gamma percentile (KM)	0.844	99% gamma percentile (KM)	1.619

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (79.45, α)	59.92	Adjusted Chi Square Value (79.45, β)	59.73
95% Gamma Approximate KM-UCL (use when n>=50)	0.245	95% Gamma Adjusted KM-UCL (use when n<50)	0.246

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.841	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.92	Detected Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.181	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.17	Detected Data Not Lognormal at 5% Significance Level	

Detected Data Not Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.124	Mean in Log Scale	-3.516
SD in Original Scale	0.349	SD in Log Scale	1.588
95% t UCL (assumes normality of ROS data)	0.174	95% Percentile Bootstrap UCL	0.176
95% BCA Bootstrap UCL	0.189	95% Bootstrap t UCL	0.207
95% H-UCL (Log ROS)	0.155		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-2.071	KM Geo Mean	0.126
KM SD (logged)	0.621	95% Critical H Value (KM-Log)	1.898
KM Standard Error of Mean (logged)	0.0576	95% H-UCL (KM -Log)	0.17
KM SD (logged)	0.621	95% Critical H Value (KM-Log)	1.898
KM Standard Error of Mean (logged)	0.0576		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.3	Mean in Log Scale	-2.189
SD in Original Scale	1.137	SD in Log Scale	1.047
95% t UCL (Assumes normality)	0.465	95% H-Stat UCL	0.238

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Data do not follow a Discernible Distribution at 5% Significance Level

Suggested UCL to Use
95% KM (Chebyshev) UCL 0.317

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

APPENDIX B-2C
SVOCs in Groundwater
micrograms per liter (µg/L)

Benzo(a)anthracene

General Statistics			
Total Number of Observations	131	Number of Distinct Observations	38
Number of Detects	25	Number of Non-Detects	106
Number of Distinct Detects	20	Number of Distinct Non-Detects	23
Minimum Detect	0.1	Minimum Non-Detect	0.097
Maximum Detect	1.2	Maximum Non-Detect	25
Variance Detects	0.107	Percent Non-Detects	80.92%
Mean Detects	0.426	SD Detects	0.326
Median Detects	0.29	CV Detects	0.766
Skewness Detects	0.924	Kurtosis Detects	-0.371
Mean of Logged Detects	-1.14	SD of Logged Detects	0.781

Normal GOF Test on Detects Only			
Shapiro Wilk Test Statistic	0.851	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.918	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.222	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.173	Detected Data Not Normal at 5% Significance Level	
Detected Data Not Normal at 5% Significance Level			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
KM Mean	0.171	KM Standard Error of Mean	0.0188
KM SD	0.198	95% KM (BCA) UCL	0.204
95% KM (t) UCL	0.202	95% KM (Percentile Bootstrap) UCL	0.204
95% KM (z) UCL	0.202	95% KM Bootstrap t UCL	21.00%
90% KM Chebyshev UCL	0.227	95% KM Chebyshev UCL	0.253
97.5% KM Chebyshev UCL	0.288	99% KM Chebyshev UCL	0.358

Gamma GOF Tests on Detected Observations Only			
A-D Test Statistic	0.835	Anderson-Darling GOF Test	
5% A-D Critical Value	0.758	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.157	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.177	Detected data appear Gamma Distributed at 5% Significance Level	
Detected data follow Appr. Gamma Distribution at 5% Significance Level			

Gamma Statistics on Detected Data Only			
k hat (MLE)	1.892	k star (bias corrected MLE)	1.692
Theta hat (MLE)	0.225	Theta star (bias corrected MLE)	0.252
nu hat (MLE)	94.61	nu star (bias corrected)	84.59
Mean (detects)	0.426		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.0942
Maximum	1.2	Median	0.01
SD	0.216	CV	2.292
k hat (MLE)	0.438	k star (bias corrected MLE)	0.433
Theta hat (MLE)	0.215	Theta star (bias corrected MLE)	0.217
nu hat (MLE)	114.7	nu star (bias corrected)	113.5
Adjusted Level of Significance (β)	0.0482		
Approximate Chi Square Value (113.46, α)	89.87	Adjusted Chi Square Value (113.46, β)	89.63
95% Gamma Approximate UCL (use when n>=50)	0.119	95% Gamma Adjusted UCL (use when n<50)	0.119

Estimates of Gamma Parameters using KM Estimates			
Mean (KM)	0.171	SD (KM)	0.198
Variance (KM)	0.0394	SE of Mean (KM)	0.0188
k hat (KM)	0.744	k star (KM)	0.732
nu hat (KM)	194.9	nu star (KM)	191.7
theta hat (KM)	0.23	theta star (KM)	0.234

APPENDIX B-2C
SVOCs in Groundwater
micrograms per liter (µg/L)

80% gamma percentile (KM)	0.281	90% gamma percentile (KM)	0.425
95% gamma percentile (KM)	0.573	99% gamma percentile (KM)	0.925

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (191.72, α)	160.7	Adjusted Chi Square Value (191.72, β)	160.4
95% Gamma Approximate KM-UCL (use when n>=50)	0.204	95% Gamma Adjusted KM-UCL (use when n<50)	0.205

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.927	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.918	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.15	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.173	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.117	Mean in Log Scale	-3.025
SD in Original Scale	0.208	SD in Log Scale	1.272
95% t UCL (assumes normality of ROS data)	0.147	95% Percentile Bootstrap UCL	0.146
95% BCA Bootstrap UCL	0.152	95% Bootstrap t UCL	0.157
95% H-UCL (Log ROS)	0.143		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-2.052	KM Geo Mean	0.128
KM SD (logged)	0.61	95% Critical H Value (KM-Log)	1.891
KM Standard Error of Mean (logged)	0.0595	95% H-UCL (KM -Log)	0.171
KM SD (logged)	0.61	95% Critical H Value (KM-Log)	1.891
KM Standard Error of Mean (logged)	0.0595		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.316	Mean in Log Scale	-2.035
SD in Original Scale	1.105	SD in Log Scale	1.101
95% t UCL (Assumes normality)	0.476	95% H-Stat UCL	0.299

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Detected Data appear Approximate Gamma Distributed at 5% Significance Level

Suggested UCL to Use

95% KM Approximate Gamma UCL	0.204	95% GROS Approximate Gamma UCL	11.90%

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test
When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

APPENDIX B-2C
SVOCs in Groundwater
micrograms per liter (µg/L)

Benzo(a)pyrene

General Statistics

Total Number of Observations	131	Number of Distinct Observations	41
Number of Detects	33	Number of Non-Detects	98
Number of Distinct Detects	25	Number of Distinct Non-Detects	22
Minimum Detect	0.11	Minimum Non-Detect	0.097
Maximum Detect	2.3	Maximum Non-Detect	25
Variance Detects	0.418	Percent Non-Detects	74.81%
Mean Detects	0.638	SD Detects	0.647
Median Detects	0.3	CV Detects	1.015
Skewness Detects	1.309	Kurtosis Detects	0.543
Mean of Logged Detects	-0.925	SD of Logged Detects	0.984

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.779	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.931	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.245	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.152	Detected Data Not Normal at 5% Significance Level	
Detected Data Not Normal at 5% Significance Level			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.249	KM Standard Error of Mean	0.0366
KM SD	0.402	95% KM (BCA) UCL	0.313
95% KM (t) UCL	0.31	95% KM (Percentile Bootstrap) UCL	0.313
95% KM (z) UCL	0.309	95% KM Bootstrap t UCL	0.326
90% KM Chebyshev UCL	0.359	95% KM Chebyshev UCL	0.408
97.5% KM Chebyshev UCL	0.478	99% KM Chebyshev UCL	0.613

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	1.377	Anderson-Darling GOF Test	
5% A-D Critical Value	0.772	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.186	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.157	Detected Data Not Gamma Distributed at 5% Significance Level	
Detected Data Not Gamma Distributed at 5% Significance Level			

Gamma Statistics on Detected Data Only

k hat (MLE)	1.191	k star (bias corrected MLE)	1.103
Theta hat (MLE)	0.535	Theta star (bias corrected MLE)	0.578
nu hat (MLE)	78.61	nu star (bias corrected)	72.8
Mean (detects)	0.638		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.174
Maximum	2.3	Median	0.01
SD	0.421	CV	2.421
k hat (MLE)	0.361	k star (bias corrected MLE)	0.358
Theta hat (MLE)	0.482	Theta star (bias corrected MLE)	0.487
nu hat (MLE)	94.53	nu star (bias corrected)	93.7
Adjusted Level of Significance (β)	0.0482		
Approximate Chi Square Value (93.70, α)	72.37	Adjusted Chi Square Value (93.70, β)	72.16
95% Gamma Approximate UCL (use when n>=50)	0.225	95% Gamma Adjusted UCL (use when n<50)	0.226

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.249	SD (KM)	0.402
Variance (KM)	0.161	SE of Mean (KM)	0.0366
k hat (KM)	0.384	k star (KM)	0.38
nu hat (KM)	100.7	nu star (KM)	99.68
theta hat (KM)	0.648	theta star (KM)	0.654

APPENDIX B-2C
SVOCs in Groundwater
micrograms per liter (µg/L)

80% gamma percentile (KM)	0.399	90% gamma percentile (KM)	0.709
95% gamma percentile (KM)	1.052	99% gamma percentile (KM)	1.919

Gamma Kaplan-Meier (KM) Statistics			
Approximate Chi Square Value (99.68, α)	77.65	Adjusted Chi Square Value (99.68, β)	7743.00%
95% Gamma Approximate KM-UCL (use when n>=50)	0.32	95% Gamma Adjusted KM-UCL (use when n<50)	0.32

Lognormal GOF Test on Detected Observations Only			
Shapiro Wilk Test Statistic	0.911	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.931	Detected Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.151	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.152	Detected Data appear Lognormal at 5% Significance Level	
Detected Data appear Approximate Lognormal at 5% Significance Level			

Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	0.193	Mean in Log Scale	-2.927
SD in Original Scale	0.414	SD in Log Scale	1.559
95% t UCL (assumes normality of ROS data)	0.253	95% Percentile Bootstrap UCL	0.257
95% BCA Bootstrap UCL	0.266	95% Bootstrap t UCL	0.272
95% H-UCL (Log ROS)	0.263		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution			
KM Mean (logged)	-1.91	KM Geo Mean	0.148
KM SD (logged)	0.806	95% Critical H Value (KM-Log)	2.03
KM Standard Error of Mean (logged)	0.0768	95% H-UCL (KM -Log)	0.237
KM SD (logged)	0.806	95% Critical H Value (KM-Log)	2.03
KM Standard Error of Mean (logged)	0.0768		

DL/2 Statistics			
DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.405	Mean in Log Scale	-1.85
SD in Original Scale	1.148	SD in Log Scale	1.229
95% t UCL (Assumes normality)	0.571	95% H-Stat UCL	0.434
DL/2 is not a recommended method, provided for comparisons and historical reasons			

Nonparametric Distribution Free UCL Statistics
Detected Data appear Approximate Lognormal Distributed at 5% Significance Level

Suggested UCL to Use
KM H-UCL 0.237

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

APPENDIX B-2C
SVOCs in Groundwater
micrograms per liter (µg/L)

Benzo(b)fluoranthene

General Statistics			
Total Number of Observations	131	Number of Distinct Observations	44
Number of Detects	37	Number of Non-Detects	94
Number of Distinct Detects	28	Number of Distinct Non-Detects	21
Minimum Detect	0.1	Minimum Non-Detect	0.097
Maximum Detect	2.4	Maximum Non-Detect	25
Variance Detects	0.424	Percent Non-Detects	71.76%
Mean Detects	0.636	SD Detects	0.651
Median Detects	0.35	CV Detects	1.023
Skewness Detects	1.491	Kurtosis Detects	1.178
Mean of Logged Detects	-0.905	SD of Logged Detects	0.95

Normal GOF Test on Detects Only			
Shapiro Wilk Test Statistic	0.762	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.936	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.265	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.144	Detected Data Not Normal at 5% Significance Level	
Detected Data Not Normal at 5% Significance Level			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
KM Mean	0.262	KM Standard Error of Mean	0.038
KM SD	0.422	95% KM (BCA) UCL	0.326
95% KM (t) UCL	0.325	95% KM (Percentile Bootstrap) UCL	0.328
95% KM (z) UCL	0.324	95% KM Bootstrap t UCL	0.347
90% KM Chebyshev UCL	0.376	95% KM Chebyshev UCL	0.428
97.5% KM Chebyshev UCL	0.499	99% KM Chebyshev UCL	0.64

Gamma GOF Tests on Detected Observations Only			
A-D Test Statistic	1.359	Anderson-Darling GOF Test	
5% A-D Critical Value	0.772	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.164	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.149	Detected Data Not Gamma Distributed at 5% Significance Level	
Detected Data Not Gamma Distributed at 5% Significance Level			

Gamma Statistics on Detected Data Only			
k hat (MLE)	1.245	k star (bias corrected MLE)	1.162
Theta hat (MLE)	0.511	Theta star (bias corrected MLE)	0.548
nu hat (MLE)	92.11	nu star (bias corrected)	8.60E+01
Mean (detects)	0.636		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.19
Maximum	2.4	Median	0.01
SD	0.444	CV	2.332
k hat (MLE)	0.363	k star (bias corrected MLE)	0.36
Theta hat (MLE)	0.524	Theta star (bias corrected MLE)	0.528
nu hat (MLE)	95.21	nu star (bias corrected)	94.36
Adjusted Level of Significance (β)	0.0482		
Approximate Chi Square Value (94.36, α)	72.96	Adjusted Chi Square Value (94.36, β)	72.75
95% Gamma Approximate UCL (use when n>=50)	0.246	95% Gamma Adjusted UCL (use when n<50)	0.247

Estimates of Gamma Parameters using KM Estimates			
Mean (KM)	0.262	SD (KM)	0.422
Variance (KM)	0.178	SE of Mean (KM)	0.038
k hat (KM)	0.385	k star (KM)	0.381
nu hat (KM)	100.7	nu star (KM)	99.77
theta hat (KM)	0.681	theta star (KM)	0.687

APPENDIX B-2C
SVOCs in Groundwater
micrograms per liter (µg/L)

80% gamma percentile (KM)	0.42	90% gamma percentile (KM)	0.746
95% gamma percentile (KM)	1.106	99% gamma percentile (KM)	2.017

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (99.77, α)	77.72	Adjusted Chi Square Value (99.77, β)	77.51
95% Gamma Approximate KM-UCL (use when n>=50)	0.336	95% Gamma Adjusted KM-UCL (use when n<50)	0.337

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.927	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.936	Detected Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.107	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.144	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Approximate Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.213	Mean in Log Scale	-2.755
SD in Original Scale	0.436	SD in Log Scale	1.518
95% t UCL (assumes normality of ROS data)	0.276	95% Percentile Bootstrap UCL	0.276
95% BCA Bootstrap UCL	0.291	95% Bootstrap t UCL	0.296
95% H-UCL (Log ROS)	0.289		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-1.871	KM Geo Mean	0.154
KM SD (logged)	0.826	95% Critical H Value (KM-Log)	2.045
KM Standard Error of Mean (logged)	0.0768	95% H-UCL (KM -Log)	0.251
KM SD (logged)	0.826	95% Critical H Value (KM-Log)	2.045
KM Standard Error of Mean (logged)	0.0768		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.383	Mean in Log Scale	-1.913
SD in Original Scale	1.155	SD in Log Scale	1.167
95% t UCL (Assumes normality)	0.551	95% H-Stat UCL	0.371

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Detected Data appear Approximate Lognormal Distributed at 5% Significance Level

Suggested UCL to Use

KM H-UCL	0.251

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

APPENDIX B-2C
SVOCs in Groundwater
micrograms per liter (µg/L)

Benzo(g,h,i)perylene

General Statistics			
Total Number of Observations	131	Number of Distinct Observations	41
Number of Detects	32	Number of Non-Detects	99
Number of Distinct Detects	27	Number of Distinct Non-Detects	21
Minimum Detect	0.1	Minimum Non-Detect	0.097
Maximum Detect	2.5	Maximum Non-Detect	2500.00%
Variance Detects	0.416	Percent Non-Detects	75.57%
Mean Detects	0.658	SD Detects	0.645
Median Detects	0.355	CV Detects	0.981
Skewness Detects	1.569	Kurtosis Detects	1.949
Mean of Logged Detects	-0.837	SD of Logged Detects	0.922

Normal GOF Test on Detects Only			
Shapiro Wilk Test Statistic	0.782	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.93	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.222	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.154	Detected Data Not Normal at 5% Significance Level	
Detected Data Not Normal at 5% Significance Level			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
KM Mean	0.245	KM Standard Error of Mean	0.036
KM SD	0.399	95% KM (BCA) UCL	0.307
95% KM (t) UCL	0.305	95% KM (Percentile Bootstrap) UCL	0.304
95% KM (z) UCL	0.304	95% KM Bootstrap t UCL	0.323
90% KM Chebyshev UCL	0.353	95% KM Chebyshev UCL	0.402
97.5% KM Chebyshev UCL	0.47	99% KM Chebyshev UCL	0.603

Gamma GOF Tests on Detected Observations Only			
A-D Test Statistic	1.127	Anderson-Darling GOF Test	
5% A-D Critical Value	0.768	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.201	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.159	Detected Data Not Gamma Distributed at 5% Significance Level	
Detected Data Not Gamma Distributed at 5% Significance Level			

Gamma Statistics on Detected Data Only			
k hat (MLE)	1.338	k star (bias corrected MLE)	1.233
Theta hat (MLE)	0.491	Theta star (bias corrected MLE)	0.533
nu hat (MLE)	85.64	nu star (bias corrected)	78.94
Mean (detects)	0.658		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.171
Maximum	2.5	Median	0.01
SD	0.42	CV	2.461
k hat (MLE)	0.36	k star (bias corrected MLE)	0.356
Theta hat (MLE)	0.475	Theta star (bias corrected MLE)	0.479
nu hat (MLE)	94.21	nu star (bias corrected)	93.38
Adjusted Level of Significance (β)	0.0482		
Approximate Chi Square Value (93.38, α)	72.1	Adjusted Chi Square Value (93.38, β)	71.89
95% Gamma Approximate UCL (use when n>=50)	0.221	95% Gamma Adjusted UCL (use when n<50)	0.222

Estimates of Gamma Parameters using KM Estimates			
Mean (KM)	0.245	SD (KM)	0.399
Variance (KM)	0.159	SE of Mean (KM)	0.036
k hat (KM)	0.378	k star (KM)	0.374
nu hat (KM)	98.96	nu star (KM)	98.03
theta hat (KM)	0.649	theta star (KM)	0.655

APPENDIX B-2C
SVOCs in Groundwater
micrograms per liter (µg/L)

80% gamma percentile (KM)	0.392	90% gamma percentile (KM)	0.7
95% gamma percentile (KM)	1.042	99% gamma percentile (KM)	1.907

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (98.03, α)	76.19	Adjusted Chi Square Value (98.03, β)	75.97
95% Gamma Approximate KM-UCL (use when n>=50)	0.315	95% Gamma Adjusted KM-UCL (use when n<50)	0.316

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.938	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.93	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.168	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.154	Detected Data Not Lognormal at 5% Significance Level	

Detected Data appear Approximate Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.195	Mean in Log Scale	-2.869
SD in Original Scale	0.413	SD in Log Scale	1.528
95% t UCL (assumes normality of ROS data)	0.254	95% Percentile Bootstrap UCL	0.256
95% BCA Bootstrap UCL	0.265	95% Bootstrap t UCL	0.27
95% H-UCL (Log ROS)	0.262		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-1.914	KM Geo Mean	0.147
KM SD (logged)	0.798	95% Critical H Value (KM-Log)	2.023
KM Standard Error of Mean (logged)	7.44E-02	95% H-UCL (KM -Log)	0.234
KM SD (logged)	0.798	95% Critical H Value (KM-Log)	2.023
KM Standard Error of Mean (logged)	0.0744		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.369	Mean in Log Scale	-1.963
SD in Original Scale	1.149	SD in Log Scale	1.164
95% t UCL (Assumes normality)	0.535	95% H-Stat UCL	0.352

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Detected Data appear Approximate Lognormal Distributed at 5% Significance Level

Suggested UCL to Use

KM H-UCL	0.234

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

APPENDIX B-2C
SVOCs in Groundwater
micrograms per liter (µg/L)

Benzo(k)fluoranthene

General Statistics

Total Number of Observations	131	Number of Distinct Observations	33
Number of Detects	19	Number of Non-Detects	112
Number of Distinct Detects	15	Number of Distinct Non-Detects	22
Minimum Detect	0.098	Minimum Non-Detect	0.097
Maximum Detect	0.77	Maximum Non-Detect	25
Variance Detects	0.0389	Percent Non-Detects	85.50%
Mean Detects	0.308	SD Detects	0.197
Median Detects	0.24	CV Detects	0.64
Skewness Detects	0.951	Kurtosis Detects	-6.18E-04
Mean of Logged Detects	-1.367	SD of Logged Detects	0.635

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.885	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.901	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.165	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.197	Detected Data appear Normal at 5% Significance Level	

Detected Data appear Approximate Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.133	KM Standard Error of Mean	0.0105
KM SD	0.11	95% KM (BCA) UCL	0.153
95% KM (t) UCL	0.151	95% KM (Percentile Bootstrap) UCL	0.151
95% KM (z) UCL	0.151	95% KM Bootstrap t UCL	0.156
90% KM Chebyshev UCL	0.165	95% KM Chebyshev UCL	0.179
97.5% KM Chebyshev UCL	0.199	99% KM Chebyshev UCL	0.238

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.504	Anderson-Darling GOF Test	
5% A-D Critical Value	0.749	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.15	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.2	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	2.785	k star (bias corrected MLE)	2.381
Theta hat (MLE)	0.111	Theta star (bias corrected MLE)	0.13
nu hat (MLE)	105.8	nu star (bias corrected)	90.46
Mean (detects)	0.308		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.0573
Maximum	0.77	Median	0.01
SD	0.128	CV	2.24
k hat (MLE)	0.546	k star (bias corrected MLE)	0.539
Theta hat (MLE)	0.105	Theta star (bias corrected MLE)	0.106
nu hat (MLE)	143.1	nu star (bias corrected)	14110.00%
Adjusted Level of Significance (β)	0.0482		
Approximate Chi Square Value (141.14, α)	114.7	Adjusted Chi Square Value (141.14, β)	114.4
95% Gamma Approximate UCL (use when n>=50)	0.0705	95% Gamma Adjusted UCL (use when n<50)	0.0706

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.133	SD (KM)	0.11
Variance (KM)	1.21E-02	SE of Mean (KM)	0.0105
k hat (KM)	1.475	k star (KM)	1.446
nu hat (KM)	386.5	nu star (KM)	379
theta hat (KM)	0.0904	theta star (KM)	0.0922

APPENDIX B-2C
SVOCs in Groundwater
micrograms per liter (µg/L)

80% gamma percentile (KM)	0.207	90% gamma percentile (KM)	0.28
95% gamma percentile (KM)	0.352	99% gamma percentile (KM)	0.513

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (378.95, α)	334.8	Adjusted Chi Square Value (378.95, β)	334.4
95% Gamma Approximate KM-UCL (use when n>=50)	0.151	95% Gamma Adjusted KM-UCL (use when n<50)	0.151

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.944	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.901	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.143	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.197	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.0789	Mean in Log Scale	-3.214
SD in Original Scale	0.123	SD in Log Scale	1.117
95% t UCL (assumes normality of ROS data)	0.0968	95% Percentile Bootstrap UCL	0.0973
95% BCA Bootstrap UCL	0.101	95% Bootstrap t UCL	0.102
95% H-UCL (Log ROS)	0.094		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-2.161	KM Geo Mean	0.115
KM SD (logged)	0.439	95% Critical H Value (KM-Log)	1.792
KM Standard Error of Mean (logged)	0.0428	95% H-UCL (KM -Log)	0.136
KM SD (logged)	0.439	95% Critical H Value (KM-Log)	1.792
KM Standard Error of Mean (logged)	0.0428		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.262	Mean in Log Scale	-2.243
SD in Original Scale	1.099	SD in Log Scale	0.986
95% t UCL (Assumes normality)	0.421	95% H-Stat UCL	0.208

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Detected Data appear Approximate Normal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL	0.151

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test
When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

APPENDIX B-2C
SVOCs in Groundwater
micrograms per liter (µg/L)

Chrysene

General Statistics

Total Number of Observations	131	Number of Distinct Observations	41
Number of Detects	39	Number of Non-Detects	92
Number of Distinct Detects	28	Number of Distinct Non-Detects	21
Minimum Detect	0.1	Minimum Non-Detect	0.098
Maximum Detect	3.3	Maximum Non-Detect	25
Variance Detects	0.431	Percent Non-Detects	70.23%
Mean Detects	0.568	SD Detects	0.656
Median Detects	0.24	CV Detects	1.155
Skewness Detects	2.367	Kurtosis Detects	6.978
Mean of Logged Detects	-1.055	SD of Logged Detects	0.965

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.714	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.939	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.247	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.14	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.254	KM Standard Error of Mean	0.0378
KM SD	0.418	95% KM (BCA) UCL	0.322
95% KM (t) UCL	0.316	95% KM (Percentile Bootstrap) UCL	0.322
95% KM (z) UCL	0.316	95% KM Bootstrap t UCL	0.34
90% KM Chebyshev UCL	0.367	95% KM Chebyshev UCL	0.419
97.5% KM Chebyshev UCL	0.49	99% KM Chebyshev UCL	0.63

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	1.622	Anderson-Darling GOF Test	
5% A-D Critical Value	0.774	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.198	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.145	Detected Data Not Gamma Distributed at 5% Significance Level	

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	1.158	k star (bias corrected MLE)	1.086
Theta hat (MLE)	0.49	Theta star (bias corrected MLE)	0.523
nu hat (MLE)	90.36	nu star (bias corrected)	84.74
Mean (detects)	0.568		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.182
Maximum	3.3	Median	0.01
SD	0.437	CV	2.405
k hat (MLE)	0.377	k star (bias corrected MLE)	0.373
Theta hat (MLE)	0.482	Theta star (bias corrected MLE)	0.487
nu hat (MLE)	98.78	nu star (bias corrected)	97.86
Adjusted Level of Significance (β)	0.0482		
Approximate Chi Square Value (97.86, α)	76.04	Adjusted Chi Square Value (97.86, β)	75.82
95% Gamma Approximate UCL (use when n>=50)	0.234	95% Gamma Adjusted UCL (use when n<50)	0.235

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.254	SD (KM)	0.418
Variance (KM)	0.175	SE of Mean (KM)	0.0378
k hat (KM)	0.369	k star (KM)	0.366
nu hat (KM)	96.68	nu star (KM)	95.8
theta hat (KM)	0.688	theta star (KM)	0.694

APPENDIX B-2C
SVOCs in Groundwater
micrograms per liter (µg/L)

80% gamma percentile (KM)	0.405	90% gamma percentile (KM)	0.728
95% gamma percentile (KM)	1.087	99% gamma percentile (KM)	2

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (95.80, α)	74.22	Adjusted Chi Square Value (95.80, β)	74.01
95% Gamma Approximate KM-UCL (use when n>=50)	0.328	95% Gamma Adjusted KM-UCL (use when n<50)	0.328

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.92	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.939	Detected Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.163	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.14	Detected Data Not Lognormal at 5% Significance Level	

Detected Data Not Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.202	Mean in Log Scale	-2.76
SD in Original Scale	0.43	SD in Log Scale	1.478
95% t UCL (assumes normality of ROS data)	0.264	95% Percentile Bootstrap UCL	0.264
95% BCA Bootstrap UCL	0.287	95% Bootstrap t UCL	0.286
95% H-UCL (Log ROS)	0.267		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-1.874	KM Geo Mean	0.153
KM SD (logged)	0.8	95% Critical H Value (KM-Log)	2.025
KM Standard Error of Mean (logged)	0.0757	95% H-UCL (KM -Log)	0.243
KM SD (logged)	0.8	95% Critical H Value (KM-Log)	2.025
KM Standard Error of Mean (logged)	0.0757		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.404	Mean in Log Scale	-1.83
SD in Original Scale	1.153	SD in Log Scale	1.207
95% t UCL (Assumes normality)	0.571	95% H-Stat UCL	0.428

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Data do not follow a Discernible Distribution at 5% Significance Level

Suggested UCL to Use
95% KM (Chebyshev) UCL 0.419

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

APPENDIX B-2C
SVOCs in Groundwater
micrograms per liter (µg/L)

Dibenzo(a,h)anthracene

General Statistics			
Total Number of Observations	131	Number of Distinct Observations	25
Number of Detects	4	Number of Non-Detects	127
Number of Distinct Detects	4	Number of Distinct Non-Detects	21
Minimum Detect	0.16	Minimum Non-Detect	0.097
Maximum Detect	0.31	Maximum Non-Detect	25
Variance Detects	0.00657	Percent Non-Detects	96.95%
Mean Detects	0.235	SD Detects	0.081
Median Detects	0.235	CV Detects	0.345
Skewness Detects	1.02E-15	Kurtosis Detects	-5.848
Mean of Logged Detects	-1.495	SD of Logged Detects	0.356

Normal GOF Test on Detects Only			
Shapiro Wilk Test Statistic	0.792	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.289	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.375	Detected Data appear Normal at 5% Significance Level	
Detected Data appear Normal at 5% Significance Level			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
KM Mean	0.103	KM Standard Error of Mean	0.00369
KM SD	0.0312	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.109	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.109	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	0.114	95% KM Chebyshev UCL	0.119
97.5% KM Chebyshev UCL	0.126	99% KM Chebyshev UCL	0.14

Gamma GOF Tests on Detected Observations Only			
A-D Test Statistic	0.592	Anderson-Darling GOF Test	
5% A-D Critical Value	0.657	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.326	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.395	Detected data appear Gamma Distributed at 5% Significance Level	
Detected data appear Gamma Distributed at 5% Significance Level			

Gamma Statistics on Detected Data Only			
k hat (MLE)	10.86	k star (bias corrected MLE)	2.881
Theta hat (MLE)	0.0216	Theta star (bias corrected MLE)	0.0816
nu hat (MLE)	86.87	nu star (bias corrected)	23.05
Mean (detects)	0.235		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.0188
Maximum	0.31	Median	0.01
SD	0.0416	CV	2.213
k hat (MLE)	1.222	k star (bias corrected MLE)	1.199
Theta hat (MLE)	0.0154	Theta star (bias corrected MLE)	0.0157
nu hat (MLE)	320.1	nu star (bias corrected)	314.1
Adjusted Level of Significance (β)	0.0482		
Approximate Chi Square Value (314.09, α)	274	Adjusted Chi Square Value (314.09, β)	273.6
95% Gamma Approximate UCL (use when n>=50)	0.0215	95% Gamma Adjusted UCL (use when n<50)	N/A

Estimates of Gamma Parameters using KM Estimates			
Mean (KM)	0.103	SD (KM)	0.0312
Variance (KM)	9.72E-04	SE of Mean (KM)	0.00369
k hat (KM)	10.88	k star (KM)	10.64
nu hat (KM)	2852	nu star (KM)	2788
theta hat (KM)	0.00945	theta star (KM)	0.00967

APPENDIX B-2C
SVOCs in Groundwater
micrograms per liter (µg/L)

80% gamma percentile (KM)	0.128	90% gamma percentile (KM)	0.145
95% gamma percentile (KM)	0.16	99% gamma percentile (KM)	0.19

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (N/A, α)	2666	Adjusted Chi Square Value (N/A, β)	2665
95% Gamma Approximate KM-UCL (use when n>=50)	0.108	95% Gamma Adjusted KM-UCL (use when n<50)	0.108

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.795	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.748	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.293	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.375	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.034	Mean in Log Scale	-3.844
SD in Original Scale	0.0442	SD in Log Scale	0.936
95% t UCL (assumes normality of ROS data)	0.0404	95% Percentile Bootstrap UCL	0.0407
95% BCA Bootstrap UCL	0.0428	95% Bootstrap t UCL	0.0427
95% H-UCL (Log ROS)	0.0396		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-2.297	KM Geo Mean	0.101
KM SD (logged)	0.18	95% Critical H Value (KM-Log)	1.688
KM Standard Error of Mean (logged)	0.0214	95% H-UCL (KM -Log)	0.105
KM SD (logged)	0.18	95% Critical H Value (KM-Log)	1.688
KM Standard Error of Mean (logged)	0.0214		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.237	Mean in Log Scale	-2.384
SD in Original Scale	1.098	SD in Log Scale	0.94
95% t UCL (Assumes normality)	0.395	95% H-Stat UCL	0.171

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Detected Data appear Normal Distributed at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL	0.109

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

APPENDIX B-2C
SVOCs in Groundwater
micrograms per liter (µg/L)

Fluoranthene

General Statistics			
Total Number of Observations	131	Number of Distinct Observations	49
Number of Detects	52	Number of Non-Detects	79
Number of Distinct Detects	37	Number of Distinct Non-Detects	19
Minimum Detect	0.1	Minimum Non-Detect	0.097
Maximum Detect	4	Maximum Non-Detect	25
Variance Detects	1.025	Percent Non-Detects	60.31%
Mean Detects	0.863	SD Detects	1.012
Median Detects	0.46	CV Detects	1.173
Skewness Detects	1.916	Kurtosis Detects	2.918
Mean of Logged Detects	-0.712	SD of Logged Detects	1.067

Normal GOF Test on Detects Only			
Shapiro Wilk Test Statistic	0.713	Normal GOF Test on Detected Observations Only	
5% Shapiro Wilk P Value	1.21E-12	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.225	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.122	Detected Data Not Normal at 5% Significance Level	
Detected Data Not Normal at 5% Significance Level			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
KM Mean	0.425	KM Standard Error of Mean	0.0656
KM SD	0.734	95% KM (BCA) UCL	0.534
95% KM (t) UCL	0.534	95% KM (Percentile Bootstrap) UCL	0.536
95% KM (z) UCL	0.533	95% KM Bootstrap t UCL	0.557
90% KM Chebyshev UCL	0.622	95% KM Chebyshev UCL	0.711
97.5% KM Chebyshev UCL	0.835	99% KM Chebyshev UCL	1.078

Gamma GOF Tests on Detected Observations Only			
A-D Test Statistic	1.447	Anderson-Darling GOF Test	
5% A-D Critical Value	0.779	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.141	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.127	Detected Data Not Gamma Distributed at 5% Significance Level	
Detected Data Not Gamma Distributed at 5% Significance Level			

Gamma Statistics on Detected Data Only			
k hat (MLE)	1.021	k star (bias corrected MLE)	0.974
Theta hat (MLE)	0.846	Theta star (bias corrected MLE)	0.886
nu hat (MLE)	106.1	nu star (bias corrected)	101.3
Mean (detects)	0.863		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.36
Maximum	4	Median	0.01
SD	0.758	CV	2.107
k hat (MLE)	0.35	k star (bias corrected MLE)	0.347
Theta hat (MLE)	1.027	Theta star (bias corrected MLE)	1.036
nu hat (MLE)	91.75	nu star (bias corrected)	90.98
Adjusted Level of Significance (β)	0.0482		
Approximate Chi Square Value (90.98, α)	69.99	Adjusted Chi Square Value (90.98, β)	69.78
95% Gamma Approximate UCL (use when n>=50)	0.468	95% Gamma Adjusted UCL (use when n<50)	0.469

Estimates of Gamma Parameters using KM Estimates			
Mean (KM)	0.425	SD (KM)	0.734
Variance (KM)	0.539	SE of Mean (KM)	0.0656
k hat (KM)	0.336	k star (KM)	0.333
nu hat (KM)	87.94	nu star (KM)	87.26
theta hat (KM)	1.267	theta star (KM)	1.277

APPENDIX B-2C
SVOCs in Groundwater
micrograms per liter (µg/L)

80% gamma percentile (KM)	0.667	90% gamma percentile (KM)	1.237
95% gamma percentile (KM)	1.88	99% gamma percentile (KM)	3.53

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (87.26, α)	66.73	Adjusted Chi Square Value (87.26, β)	66.53
95% Gamma Approximate KM-UCL (use when n>=50)	0.556	95% Gamma Adjusted KM-UCL (use when n<50)	0.558

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Approximate Test Statistic	0.937	Shapiro Wilk GOF Test	
5% Shapiro Wilk P Value	0.0118	Detected Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.108	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.122	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Approximate Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.384	Mean in Log Scale	-2.155
SD in Original Scale	0.746	SD in Log Scale	1.549
95% t UCL (assumes normality of ROS data)	0.492	95% Percentile Bootstrap UCL	0.499
95% BCA Bootstrap UCL	0.515	95% Bootstrap t UCL	0.532
95% H-UCL (Log ROS)	0.558		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-1.589	KM Geo Mean	0.204
KM SD (logged)	1.039	95% Critical H Value (KM-Log)	2.227
KM Standard Error of Mean (logged)	0.0971	95% H-UCL (KM -Log)	0.429
KM SD (logged)	1.039	95% Critical H Value (KM-Log)	2.227
KM Standard Error of Mean (logged)	0.0971		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.564	Mean in Log Scale	-1.539
SD in Original Scale	1.282	SD in Log Scale	1.318
95% t UCL (Assumes normality)	0.749	95% H-Stat UCL	0.683

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Detected Data appear Approximate Lognormal Distributed at 5% Significance Level

Suggested UCL to Use

KM H-UCL	0.429

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

APPENDIX B-2C
SVOCs in Groundwater
micrograms per liter (µg/L)

Fluorene

General Statistics			
Total Number of Observations	131	Number of Distinct Observations	35
Number of Detects	17	Number of Non-Detects	114
Number of Distinct Detects	15	Number of Distinct Non-Detects	20
Minimum Detect	0.12	Minimum Non-Detect	9.70%
Maximum Detect	5.6	Maximum Non-Detect	25
Variance Detects	4.32	Percent Non-Detects	87.02%
Mean Detects	2.098	SD Detects	2.078
Median Detects	1.3	CV Detects	0.991
Skewness Detects	0.571	Kurtosis Detects	-1.395
Mean of Logged Detects	-0.0258	SD of Logged Detects	1.456

Normal GOF Test on Detects Only			
Shapiro Wilk Test Statistic	0.829	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.892	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.238	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.207	Detected Data Not Normal at 5% Significance Level	
Detected Data Not Normal at 5% Significance Level			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
KM Mean	0.361	KM Standard Error of Mean	0.0898
KM SD	0.993	95% KM (BCA) UCL	0.516
95% KM (t) UCL	0.51	95% KM (Percentile Bootstrap) UCL	0.515
95% KM (z) UCL	0.509	95% KM Bootstrap t UCL	0.568
90% KM Chebyshev UCL	0.631	95% KM Chebyshev UCL	0.753
97.5% KM Chebyshev UCL	0.922	99% KM Chebyshev UCL	1.255

Gamma GOF Tests on Detected Observations Only			
A-D Test Statistic	0.796	Anderson-Darling GOF Test	
5% A-D Critical Value	0.775	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.182	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.217	Detected data appear Gamma Distributed at 5% Significance Level	
Detected data follow Appr. Gamma Distribution at 5% Significance Level			

Gamma Statistics on Detected Data Only			
k hat (MLE)	0.777	k star (bias corrected MLE)	0.679
Theta hat (MLE)	2.699	Theta star (bias corrected MLE)	3.088
nu hat (MLE)	26.42	nu star (bias corrected)	23.09
Mean (detects)	2.098		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.281
Maximum	5.6	Median	0.01
SD	1.014	CV	3.609
k hat (MLE)	0.258	k star (bias corrected MLE)	0.257
Theta hat (MLE)	1.09	Theta star (bias corrected MLE)	1.093
nu hat (MLE)	67.55	nu star (bias corrected)	67.34
Adjusted Level of Significance (β)	0.0482		
Approximate Chi Square Value (67.34, α)	49.45	Adjusted Chi Square Value (67.34, β)	49.28
95% Gamma Approximate UCL (use when n>=50)	0.383	95% Gamma Adjusted UCL (use when n<50)	0.384

Estimates of Gamma Parameters using KM Estimates			
Mean (KM)	0.361	SD (KM)	0.993
Variance (KM)	0.986	SE of Mean (KM)	0.0898
k hat (KM)	0.132	k star (KM)	0.134
nu hat (KM)	34.69	nu star (KM)	35.23
theta hat (KM)	2.729	theta star (KM)	2.687

APPENDIX B-2C
SVOCs in Groundwater
micrograms per liter (µg/L)

80% gamma percentile (KM)	0.357	90% gamma percentile (KM)	1.052
95% gamma percentile (KM)	2.028	99% gamma percentile (KM)	4.929

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (35.23, α)	22.65	Adjusted Chi Square Value (35.23, β)	22.54
95% Gamma Approximate KM-UCL (use when n>=50)	0.562	95% Gamma Adjusted KM-UCL (use when n<50)	0.565

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.876	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.892	Detected Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.198	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.207	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Approximate Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.283	Mean in Log Scale	-5.214
SD in Original Scale	1.013	SD in Log Scale	2.915
95% t UCL (assumes normality of ROS data)	0.43	95% Percentile Bootstrap UCL	0.439
95% BCA Bootstrap UCL	0.48	95% Bootstrap t UCL	0.49
95% H-UCL (Log ROS)	1.178		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-2.017	KM Geo Mean	0.133
KM SD (logged)	0.934	95% Critical H Value (KM-Log)	2.135
KM Standard Error of Mean (logged)	0.0854	95% H-UCL (KM -Log)	0.245
KM SD (logged)	0.934	95% Critical H Value (KM-Log)	2.135
KM Standard Error of Mean (logged)	0.0854		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.472	Mean in Log Scale	-2.144
SD in Original Scale	1.456	SD in Log Scale	1.279
95% t UCL (Assumes normality)	0.683	95% H-Stat UCL	0.35

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Detected Data appear Approximate Gamma Distributed at 5% Significance Level

Suggested UCL to Use

95% KM Approximate Gamma UCL	0.562

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test
When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

APPENDIX B-2C
SVOCs in Groundwater
micrograms per liter (µg/L)

Indeno(1,2,3-cd)pyrene

General Statistics			
Total Number of Observations	131	Number of Distinct Observations	36
Number of Detects	25	Number of Non-Detects	106
Number of Distinct Detects	20	Number of Distinct Non-Detects	22
Minimum Detect	0.12	Minimum Non-Detect	0.097
Maximum Detect	1.9	Maximum Non-Detect	25
Variance Detects	0.199	Percent Non-Detects	80.92%
Mean Detects	0.548	SD Detects	0.446
Median Detects	0.38	CV Detects	0.814
Skewness Detects	1.396	Kurtosis Detects	1.987
Mean of Logged Detects	-0.902	SD of Logged Detects	0.792

Normal GOF Test on Detects Only			
Shapiro Wilk Test Statistic	0.837	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.918	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.19	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.173	Detected Data Not Normal at 5% Significance Level	
Detected Data Not Normal at 5% Significance Level			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
KM Mean	0.193	KM Standard Error of Mean	0.0245
KM SD	0.266	95% KM (BCA) UCL	0.237
95% KM (t) UCL	0.233	95% KM (Percentile Bootstrap) UCL	0.234
95% KM (z) UCL	0.233	95% KM Bootstrap t UCL	0.246
90% KM Chebyshev UCL	0.266	95% KM Chebyshev UCL	0.299
97.5% KM Chebyshev UCL	0.346	99% KM Chebyshev UCL	0.436

Gamma GOF Tests on Detected Observations Only			
A-D Test Statistic	0.828	Anderson-Darling GOF Test	
5% A-D Critical Value	0.758	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.189	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.177	Detected Data Not Gamma Distributed at 5% Significance Level	
Detected Data Not Gamma Distributed at 5% Significance Level			

Gamma Statistics on Detected Data Only			
k hat (MLE)	1.813	k star (bias corrected MLE)	1.622
Theta hat (MLE)	0.302	Theta star (bias corrected MLE)	0.338
nu hat (MLE)	90.66	nu star (bias corrected)	81.12
Mean (detects)	0.548		

Gamma ROS Statistics using Imputed Non-Detects			
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs			
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)			
For such situations, GROS method may yield incorrect values of UCLs and BTVs			
This is especially true when the sample size is small.			
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates			
Minimum	0.01	Mean	0.115
Maximum	1.9	Median	0.01
SD	0.286	CV	2.49
k hat (MLE)	0.392	k star (bias corrected MLE)	0.389
Theta hat (MLE)	0.292	Theta star (bias corrected MLE)	0.295
nu hat (MLE)	102.8	nu star (bias corrected)	101.8
Adjusted Level of Significance (β)	0.0482		
Approximate Chi Square Value (101.79, α)	79.51	Adjusted Chi Square Value (101.79, β)	79.3
95% Gamma Approximate UCL (use when n>=50)	0.147	95% Gamma Adjusted UCL (use when n<50)	0.147

Estimates of Gamma Parameters using KM Estimates			
Mean (KM)	0.193	SD (KM)	0.266
Variance (KM)	0.0708	SE of Mean (KM)	0.0245
k hat (KM)	0.524	k star (KM)	0.517
nu hat (KM)	137.3	nu star (KM)	135.4
theta hat (KM)	0.368	theta star (KM)	0.373

APPENDIX B-2C
SVOCs in Groundwater
micrograms per liter (µg/L)

80% gamma percentile (KM)	0.317	90% gamma percentile (KM)	0.517
95% gamma percentile (KM)	0.731	99% gamma percentile (KM)	1.255

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (135.44, α)	109.6	Adjusted Chi Square Value (135.44, β)	109.3
95% Gamma Approximate KM-UCL (use when n>=50)	0.238	95% Gamma Adjusted KM-UCL (use when n<50)	0.239

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.93	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.918	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.18	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.173	Detected Data Not Lognormal at 5% Significance Level	

Detected Data appear Approximate Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.141	Mean in Log Scale	-2.994
SD in Original Scale	0.278	SD in Log Scale	1.384
95% t UCL (assumes normality of ROS data)	0.181	95% Percentile Bootstrap UCL	0.181
95% BCA Bootstrap UCL	0.186	95% Bootstrap t UCL	0.195
95% H-UCL (Log ROS)	0.178		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-2.015	KM Geo Mean	0.133
KM SD (logged)	0.678	95% Critical H Value (KM-Log)	1.936
KM Standard Error of Mean (logged)	0.0641	95% H-UCL (KM -Log)	0.188
KM SD (logged)	0.678	95% Critical H Value (KM-Log)	1.936
KM Standard Error of Mean (logged)	0.0641		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.324	Mean in Log Scale	-2.052
SD in Original Scale	1.117	SD in Log Scale	1.109
95% t UCL (Assumes normality)	0.486	95% H-Stat UCL	0.297

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Detected Data appear Approximate Lognormal Distributed at 5% Significance Level

Suggested UCL to Use

KM H-UCL	0.188

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

APPENDIX B-2C
SVOCs in Groundwater
micrograms per liter (µg/L)

Naphthalene

General Statistics

Total Number of Observations	129	Number of Distinct Observations	43
Number of Detects	32	Number of Non-Detects	97
Number of Distinct Detects	26	Number of Distinct Non-Detects	20
Minimum Detect	0.11	Minimum Non-Detect	0.098
Maximum Detect	41	Maximum Non-Detect	2.9
Variance Detects	73.4	Percent Non-Detects	75.19%
Mean Detects	3.377	SD Detects	8.567
Median Detects	0.335	CV Detects	2.537
Skewness Detects	3.629	Kurtosis Detects	13.55
Mean of Logged Detects	-0.443	SD of Logged Detects	1.642

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.434	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.93	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.381	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.154	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.921	KM Standard Error of Mean	0.396
KM SD	4.431	95% KM (BCA) UCL	1.726
95% KM (t) UCL	1.578	95% KM (Percentile Bootstrap) UCL	1.602
95% KM (z) UCL	1.573	95% KM Bootstrap t UCL	3.296
90% KM Chebyshev UCL	2.11	95% KM Chebyshev UCL	2.649
97.5% KM Chebyshev UCL	3.397	99% KM Chebyshev UCL	4.865

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	3.268	Anderson-Darling GOF Test	
5% A-D Critical Value	0.833	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.238	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.167	Detected Data Not Gamma Distributed at 5% Significance Level	

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.397	k star (bias corrected MLE)	0.381
Theta hat (MLE)	8.508	Theta star (bias corrected MLE)	8.875
nu hat (MLE)	25.4	nu star (bias corrected)	24.35
Mean (detects)	3.377		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.845
Maximum	41	Median	0.01
SD	4.462	CV	5.279
k hat (MLE)	0.214	k star (bias corrected MLE)	0.214
Theta hat (MLE)	3.951	Theta star (bias corrected MLE)	3.948
nu hat (MLE)	55.18	nu star (bias corrected)	55.23
Adjusted Level of Significance (β)	0.0481		
Approximate Chi Square Value (55.23, α)	39.16	Adjusted Chi Square Value (55.23, β)	39
95% Gamma Approximate UCL (use when n>=50)	1.192	95% Gamma Adjusted UCL (use when n<50)	1.197

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.921	SD (KM)	4.431
Variance (KM)	19.63	SE of Mean (KM)	0.396
k hat (KM)	0.0432	k star (KM)	0.0474
nu hat (KM)	11.15	nu star (KM)	12.22
theta hat (KM)	21.32	theta star (KM)	19.44

APPENDIX B-2C
SVOCs in Groundwater
micrograms per liter (µg/L)

80% gamma percentile (KM)	0.103	90% gamma percentile (KM)	1.306
95% gamma percentile (KM)	4.798	99% gamma percentile (KM)	20.46

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (12.22, α)	5.373	Adjusted Chi Square Value (12.22, β)	5.322
95% Gamma Approximate KM-UCL (use when n>=50)	2.095	95% Gamma Adjusted KM-UCL (use when n<50)	2.115

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.879	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.93	Detected Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.188	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.154	Detected Data Not Lognormal at 5% Significance Level	

Detected Data Not Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.85	Mean in Log Scale	-4.179
SD in Original Scale	4.461	SD in Log Scale	2.823
95% t UCL (assumes normality of ROS data)	1.5	95% Percentile Bootstrap UCL	1.609
95% BCA Bootstrap UCL	1.943	95% Bootstrap t UCL	3.141
95% H-UCL (Log ROS)	2.401		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-1.812	KM Geo Mean	0.163
KM SD (logged)	1.149	95% Critical H Value (KM-Log)	2.329
KM Standard Error of Mean (logged)	0.105	95% H-UCL (KM -Log)	0.4
KM SD (logged)	1.149	95% Critical H Value (KM-Log)	2.329
KM Standard Error of Mean (logged)	0.105		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.975	Mean in Log Scale	-1.85
SD in Original Scale	4.443	SD in Log Scale	1.443
95% t UCL (Assumes normality)	1.623	95% H-Stat UCL	0.622

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Data do not follow a Discernible Distribution at 5% Significance Level

Suggested UCL to Use

95% KM (Chebyshev) UCL	2.649

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

APPENDIX B-2C
SVOCs in Groundwater
micrograms per liter (µg/L)

Acenaphthene

General Statistics

Total Number of Observations	131	Number of Distinct Observations	40
Number of Detects	22	Number of Non-Detects	109
Number of Distinct Detects	22	Number of Distinct Non-Detects	20
Minimum Detect	0.14	Minimum Non-Detect	0.097
Maximum Detect	5.3	Maximum Non-Detect	25
Variance Detects	2.513	Percent Non-Detects	83.21%
Mean Detects	1.564	SD Detects	1.585
Median Detects	0.69	CV Detects	1.014
Skewness Detects	0.981	Kurtosis Detects	-0.138
Mean of Logged Detects	-0.181	SD of Logged Detects	1.231

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.839	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.911	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.237	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.184	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.348	KM Standard Error of Mean	0.0757
KM SD	0.842	95% KM (BCA) UCL	0.484
95% KM (t) UCL	0.474	95% KM (Percentile Bootstrap) UCL	0.475
95% KM (z) UCL	0.473	95% KM Bootstrap t UCL	0.516
90% KM Chebyshev UCL	0.575	95% KM Chebyshev UCL	0.678
97.5% KM Chebyshev UCL	0.821	99% KM Chebyshev UCL	1.101

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.808	Anderson-Darling GOF Test	
5% A-D Critical Value	0.774	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.177	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.191	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data follow Appr. Gamma Distribution at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.928	k star (bias corrected MLE)	0.832
Theta hat (MLE)	1.686	Theta star (bias corrected MLE)	1.881
nu hat (MLE)	40.82	nu star (bias corrected)	36.59
Mean (detects)	1.564		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.271
Maximum	5.3	Median	0.01
SD	0.864	CV	3.187
k hat (MLE)	0.274	k star (bias corrected MLE)	0.273
Theta hat (MLE)	0.99	Theta star (bias corrected MLE)	0.994
nu hat (MLE)	71.73	nu star (bias corrected)	71.42
Adjusted Level of Significance (β)	0.0482		
Approximate Chi Square Value (71.42, α)	52.96	Adjusted Chi Square Value (71.42, β)	52.79
95% Gamma Approximate UCL (use when n>=50)	0.365	95% Gamma Adjusted UCL (use when n<50)	0.367

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.348	SD (KM)	0.842
Variance (KM)	0.709	SE of Mean (KM)	0.0757
k hat (KM)	0.171	k star (KM)	0.172
nu hat (KM)	44.79	nu star (KM)	45.1
theta hat (KM)	2.036	theta star (KM)	2.023

APPENDIX B-2C
SVOCs in Groundwater
micrograms per liter (µg/L)

80% gamma percentile (KM)	0.42	90% gamma percentile (KM)	1.047
95% gamma percentile (KM)	1.861	99% gamma percentile (KM)	4.161

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (45.10, α)	30.69	Adjusted Chi Square Value (45.10, β)	30.56
95% Gamma Approximate KM-UCL (use when n>=50)	0.512	95% Gamma Adjusted KM-UCL (use when n<50)	0.514

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.914	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.911	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.148	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.184	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.282	Mean in Log Scale	-4.048
SD in Original Scale	0.861	SD in Log Scale	2.395
95% t UCL (assumes normality of ROS data)	0.406	95% Percentile Bootstrap UCL	0.406
95% BCA Bootstrap UCL	0.433	95% Bootstrap t UCL	0.452
95% H-UCL (Log ROS)	0.675		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-1.955	KM Geo Mean	0.142
KM SD (logged)	0.95	95% Critical H Value (KM-Log)	2.148
KM Standard Error of Mean (logged)	0.086	95% H-UCL (KM -Log)	0.266
KM SD (logged)	0.95	95% Critical H Value (KM-Log)	2.148
KM Standard Error of Mean (logged)	0.086		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.447	Mean in Log Scale	-2.142
SD in Original Scale	1.361	SD in Log Scale	1.267
95% t UCL (Assumes normality)	0.644	95% H-Stat UCL	0.344

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Detected Data appear Approximate Gamma Distributed at 5% Significance Level

Suggested UCL to Use

95% KM Approximate Gamma UCL	0.512

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test
When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

APPENDIX B-2C
SVOCs in Groundwater
micrograms per liter (µg/L)

Phenanthrene

General Statistics

Total Number of Observations	131	Number of Distinct Observations	52
Number of Detects	53	Number of Non-Detects	78
Number of Distinct Detects	41	Number of Distinct Non-Detects	20
Minimum Detect	0.11	Minimum Non-Detect	0.098
Maximum Detect	10	Maximum Non-Detect	25
Variance Detects	6.709	Percent Non-Detects	59.54%
Mean Detects	1.402	SD Detects	2.59
Median Detects	0.34	CV Detects	1.848
Skewness Detects	2.595	Kurtosis Detects	5.78
Mean of Logged Detects	-0.699	SD of Logged Detects	1.3

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.529	Normal GOF Test on Detected Observations Only	
5% Shapiro Wilk P Value	0	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.334	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.121	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.639	KM Standard Error of Mean	0.156
KM SD	1.757	95% KM (BCA) UCL	0.912
95% KM (t) UCL	0.897	95% KM (Percentile Bootstrap) UCL	0.906
95% KM (z) UCL	0.895	95% KM Bootstrap t UCL	0.992
90% KM Chebyshev UCL	1.106	95% KM Chebyshev UCL	1.318
97.5% KM Chebyshev UCL	1.611	99% KM Chebyshev UCL	2.188

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	4.842	Anderson-Darling GOF Test	
5% A-D Critical Value	0.806	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.254	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.128	Detected Data Not Gamma Distributed at 5% Significance Level	

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.597	k star (bias corrected MLE)	0.575
Theta hat (MLE)	2.349	Theta star (bias corrected MLE)	2.436
nu hat (MLE)	63.24	nu star (bias corrected)	61
Mean (detects)	1.402		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.573
Maximum	10	Median	0.01
SD	1.776	CV	3.099
k hat (MLE)	0.282	k star (bias corrected MLE)	0.281
Theta hat (MLE)	2.031	Theta star (bias corrected MLE)	2.041
nu hat (MLE)	73.94	nu star (bias corrected)	73.58
Adjusted Level of Significance (β)	0.0482		
Approximate Chi Square Value (73.58, α)	54.82	Adjusted Chi Square Value (73.58, β)	54.65
95% Gamma Approximate UCL (use when n>=50)	0.769	95% Gamma Adjusted UCL (use when n<50)	0.772

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.639	SD (KM)	1.757
Variance (KM)	3.086	SE of Mean (KM)	0.156
k hat (KM)	0.132	k star (KM)	0.135
nu hat (KM)	34.71	nu star (KM)	35.24
theta hat (KM)	4.827	theta star (KM)	4.753

APPENDIX B-2C
SVOCs in Groundwater
micrograms per liter (µg/L)

80% gamma percentile (KM)	0.632	90% gamma percentile (KM)	1.861
95% gamma percentile (KM)	3.588	99% gamma percentile (KM)	8.719

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (35.24, α)	22.66	Adjusted Chi Square Value (35.24, β)	22.55
95% Gamma Approximate KM-UCL (use when n>=50)	0.994	95% Gamma Adjusted KM-UCL (use when n<50)	0.999

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Approximate Test Statistic	0.863	Shapiro Wilk GOF Test	
5% Shapiro Wilk P Value	2.36E-06	Detected Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.154	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.121	Detected Data Not Lognormal at 5% Significance Level	

Detected Data Not Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.59	Mean in Log Scale	-2.534
SD in Original Scale	1.771	SD in Log Scale	1.941
95% t UCL (assumes normality of ROS data)	0.846	95% Percentile Bootstrap UCL	0.846
95% BCA Bootstrap UCL	0.941	95% Bootstrap t UCL	0.958
95% H-UCL (Log ROS)	0.898		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-1.605	KM Geo Mean	0.201
KM SD (logged)	1.136	95% Critical H Value (KM-Log)	2.318
KM Standard Error of Mean (logged)	0.102	95% H-UCL (KM -Log)	0.482
KM SD (logged)	1.136	95% Critical H Value (KM-Log)	2.318
KM Standard Error of Mean (logged)	0.102		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.741	Mean in Log Scale	-1.681
SD in Original Scale	2.041	SD in Log Scale	1.369
95% t UCL (Assumes normality)	1.037	95% H-Stat UCL	0.646

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Data do not follow a Discernible Distribution at 5% Significance Level

Suggested UCL to Use

95% KM (Chebyshev) UCL	1.318

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

APPENDIX B-2C
SVOCs in Groundwater
micrograms per liter (µg/L)

Pyrene

General Statistics			
Total Number of Observations	131	Number of Distinct Observations	58
Number of Detects	60	Number of Non-Detects	71
Number of Distinct Detects	46	Number of Distinct Non-Detects	18
Minimum Detect	0.12	Minimum Non-Detect	0.097
Maximum Detect	5.7	Maximum Non-Detect	25
Variance Detects	1.693	Percent Non-Detects	54.20%
Mean Detects	1.042	SD Detects	1.301
Median Detects	0.52	CV Detects	1.249
Skewness Detects	2.044	Kurtosis Detects	3.815
Mean of Logged Detects	-0.587	SD of Logged Detects	1.116

Normal GOF Test on Detects Only			
Shapiro Wilk Test Statistic	0.708	Normal GOF Test on Detected Observations Only	
5% Shapiro Wilk P Value	2.22E-15	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.26	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.114	Detected Data Not Normal at 5% Significance Level	
Detected Data Not Normal at 5% Significance Level			

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
KM Mean	0.546	KM Standard Error of Mean	0.088
KM SD	0.992	95% KM (BCA) UCL	0.687
95% KM (t) UCL	0.692	95% KM (Percentile Bootstrap) UCL	0.698
95% KM (z) UCL	0.691	95% KM Bootstrap t UCL	0.728
90% KM Chebyshev UCL	0.81	95% KM Chebyshev UCL	0.93
97.5% KM Chebyshev UCL	1.096	99% KM Chebyshev UCL	1.422

Gamma GOF Tests on Detected Observations Only			
A-D Test Statistic	1.93	Anderson-Darling GOF Test	
5% A-D Critical Value	0.783	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.15	Kolmogorov-Smirnov GOF	
5% K-S Critical Value	0.118	Detected Data Not Gamma Distributed at 5% Significance Level	
Detected Data Not Gamma Distributed at 5% Significance Level			

Gamma Statistics on Detected Data Only			
k hat (MLE)	0.928	k star (bias corrected MLE)	0.892
Theta hat (MLE)	1.123	Theta star (bias corrected MLE)	1.168
nu hat (MLE)	111.3	nu star (bias corrected)	107.1
Mean (detects)	1.042		

Gamma ROS Statistics using Imputed Non-Detects
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.485
Maximum	5.7	Median	0.01
SD	1.016	CV	2.097
k hat (MLE)	0.338	k star (bias corrected MLE)	0.336
Theta hat (MLE)	1.432	Theta star (bias corrected MLE)	1.443
nu hat (MLE)	88.68	nu star (bias corrected)	87.98
Adjusted Level of Significance (β)	0.0482		
Approximate Chi Square Value (87.98, α)	67.36	Adjusted Chi Square Value (87.98, β)	67.16
95% Gamma Approximate UCL (use when n>=50)	0.633	95% Gamma Adjusted UCL (use when n<50)	0.635

Estimates of Gamma Parameters using KM Estimates			
Mean (KM)	0.546	SD (KM)	0.992
Variance (KM)	0.985	SE of Mean (KM)	0.088
k hat (KM)	0.303	k star (KM)	0.301
nu hat (KM)	79.36	nu star (KM)	78.87
theta hat (KM)	1.803	theta star (KM)	1.814

APPENDIX B-2C
SVOCs in Groundwater
micrograms per liter (µg/L)

80% gamma percentile (KM)	0.838	90% gamma percentile (KM)	1.61
95% gamma percentile (KM)	2.496	99% gamma percentile (KM)	4.796

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (78.87, α)	59.41	Adjusted Chi Square Value (78.87, β)	59.23
95% Gamma Approximate KM-UCL (use when n>=50)	0.725	95% Gamma Adjusted KM-UCL (use when n<50)	0.727

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Approximate Test Statistic	0.929	Shapiro Wilk GOF Test	
5% Shapiro Wilk P Value	0.00213	Detected Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.119	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.114	Detected Data Not Lognormal at 5% Significance Level	

Detected Data Not Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.511	Mean in Log Scale	-1.966
SD in Original Scale	1.005	SD in Log Scale	1.629
95% t UCL (assumes normality of ROS data)	0.657	95% Percentile Bootstrap UCL	0.655
95% BCA Bootstrap UCL	0.698	95% Bootstrap t UCL	0.69
95% H-UCL (Log ROS)	0.79		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-1.462	KM Geo Mean	0.232
KM SD (logged)	1.135	95% Critical H Value (KM-Log)	2.316
KM Standard Error of Mean (logged)	0.103	95% H-UCL (KM -Log)	0.555
KM SD (logged)	1.135	95% Critical H Value (KM-Log)	2.316
KM Standard Error of Mean (logged)	0.103		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.652	Mean in Log Scale	-1.501
SD in Original Scale	1.441	SD in Log Scale	1.347
95% t UCL (Assumes normality)	0.86	95% H-Stat UCL	0.745

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Data do not follow a Discernible Distribution at 5% Significance Level

Suggested UCL to Use

95% KM (Chebyshev) UCL	0.93

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

APPENDIX C
Trench Model

APPENDIX C

For a hypothetical future construction worker, inhalation of volatiles in ambient air within a trench is potentially complete. Therefore, transport of volatile organic compounds (VOCs) detected in groundwater to outdoor air in a trench was evaluated using a modified version of the Virginia Department of Environmental Quality (VDEQ) model (VDEQ, 2019). This transport process is characterized by a "volatilization factor" (VF), which is defined as the volatile chemical concentration in outdoor air in a trench ($C_{OA,\ trench}$) divided by the volatile chemical concentration in soil vapor (C_{SV}) based on groundwater concentrations. Thus, the concentration of a VOC in outdoor air in a trench can be expressed as a function of the chemical concentration in soil vapor and the VF:

$$C_{OA\ trench} = C_{SV} \times VF_{trench}$$

Where:

$C_{OA\ trench}$	=	chemical concentration in outdoor air in a trench (mg/m^3);
C_{SV}	=	chemical concentration in soil vapor (mg/m^3); and
VF_{trench}	=	volatilization factor from soil vapor into outdoor air in a trench (unitless).

Chemical-specific trench VFs were developed as described below and are applied to the results reported in groundwater. The estimated 95% UCLs or maximum concentrations of each detected VOC in groundwater were used to estimate trench air exposure point concentrations.

Trench Model

The VDEQ published a model which predicts exposure of workers to volatile chemicals in construction and utility trenches (VDEQ, 2019). The model includes two different approaches for estimating volatilization of a contaminant from groundwater to a trench: one based on groundwater pooling in the trench, and the other based on chemical transport through the vadose zone. The VF is based on a modification of the VDEQ model for chemical transport through the vadose zone. A box model is then used to estimate dilution within the trench. The VDEQ model does not account for potential transport of chemicals through the sidewalls of a trench. To account for chemical transport through the sidewalls as well as the bottom of the trench, the area of the trench (A) (which represents the area of the bottom of the trench in the VDEQ model) was modified to include the total area of the four sides and the bottom of the trench.

Trench air concentrations based on a groundwater source below the bottom of the trench are estimated by the VDEQ (2019) model as follows:

$$C_{trench} = C_{GW} \times VF$$

$$VF = \frac{H \times Dair \times Pa^{3.33} \times A \times F \times 10^{-3} \times 10^{4} \times 3600}{R \times T \times Ld \times ACH \times V \times Pt^{2}}$$

Where:

C_{trench}	=	chemical concentration in outdoor air in a trench ($\mu g/m^3$)
C_{GW}	=	chemical concentration in groundwater (micrograms per liter [µg/L])
VF	=	volatilization factor (liters per cubic meter [L/m^3])
H	=	Henry's law constant (atmosphere-cubic meter per mole [$atm\text{-}m^3/mol$])
D_{air}	=	diffusion coefficient in air (cm^2/sec)
Pa	=	air-filled porosity (unitless)
A	=	area of trench (m^2)
F	=	fraction of floor through which chemical can enter (unitless)
R	=	gas constant ($8.2x10^{-5}$ atmosphere-cubic meter per Kelvin [$atm\text{-}m^3/mol\text{-}K$)
T	=	average temperature (kelvin [K])
Ld	=	distance between trench bottom and soil vapor source (cm)
ACH	=	air exchanges per hour (hr^{-1})
V	=	volume of trench (m^3)
Pt	=	total soil porosity (unitless)
10^{-3}	=	conversion factor (liter per cubic centimeter [L/cm^3])
10^4	=	conversion factor (square centimeter per square meter [cm^2/m^2])
3600	-	conversion factor (seconds per hour [sec/hr])

Combining the above equations provides the following:

$$C_{trench} = C_{GW} \times \frac{H \times Dair \times Pa^{3.33} \times A \times F \times 10^{-3} \times 10^{4} \times 3600}{R \times T \times Ld \times ACH \times V \times Pt^{2}}$$

Soil vapor concentrations can be estimated from groundwater concentrations using the following equation (DTSC, 2011):

$$C_{SV} = H' \times C_{GW}$$

$$H' = H / R \times T$$

Where:

Csv	=	chemical concentration in soil vapor (µg/m^3)
H'	=	dimensionless Henry's Constant (unitless)

Rearranging the equations above to solve for groundwater concentrations (C_{GW}):

$$C_{GW} = Csv \times (R \times T) / H$$

Substituting C_{GW} into the VDEQ model provides the following:

$$C_{trench} = C_{SV} \times [(R \times T) / H] \times \frac{H \times Dair \times Pa^{3.33} \times A \times F \times 10^{-3} \times 10^4 \times 3600}{R \times T \times Ld \times ACH \times V \times Pt^2}$$

Finally, the above equation can be simplified to the following equations to estimate the concentrations in trench air from soil vapor.

$$C_{trench} = C_{SV} \times \frac{Dair \times Pa^{3.33} \times A \times F \times 10^4 \times 3600}{Ld \times ACH \times V \times Pt^2 \times 10^6}$$

$$C_{trench} = C_{SV} \times VF_{trench}$$

$$VF_{trench} = \frac{Dair \times Pa^{3.33} \times A \times F \times 10^4 \times 3600}{Ld \times ACH \times V \times Pt^2 \times 10^6}$$

Where:

VF_{trench}	=	volatilization factor from soil vapor into outdoor air in a trench (unitless)
Ld	=	distance between trench bottom and soil vapor (cm)
10^4	=	conversion factor (cm^2/m^2)
3600	=	conversion factor (sec/hr)
10^6	=	conversion factor (cubic centimeter per cubic meter [cm^3/m^3])

Model Input Parameters

A summary of the model input parameters for the trench is presented in Table C1. In the absence of any site-specific information regarding trench dimensions for a hypothetical future construction worker, it is assumed that on average, trench dimensions are: 12 feet in length, 4 feet wide, and 10 feet deep, which is consistent with the depth of soil used for direct exposures. The fraction of the trench floor and sides through which chemicals can enter (F) was conservatively assumed to be 1, indicating the entire base of the trench and sides of the trench are within the contaminated zone and exposed. An air exchange rate of 2 air exchanges (ACH) per hour was used (VDEQ, 2019). Finally, default U.S. EPA soil property values was used for air-filled porosity (0.28) and total porosity (0.43) in the vadose zone.

For the distance between the trench sides/bottom and the soil vapor source (L_d), a L_d value of 0.5 cm was selected as a reasonable distance between the sides/bottom of the trench and the vapor source. Default chemical-specific physicochemical properties were used in calculating the VFs for the COPCs in soil vapor.

Table C1 presents the VF_{trench} values estimated for COPCs. The estimated chemical concentrations in outdoor air in a trench from groundwater are presented in the main body of the report.

References

Department of Toxic Substances Control. 2011. Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion to Indoor Air. Final. October.

Virginia Department of Environmental Quality. 2019. Voluntary Remediation Program Risk Assessment Guidance.

TABLE C1
SUMMARY OF TRENCH MODEL[1] INPUTS AND VOLATILIZATION FACTORS
Brisbane Baylands OU2
Brisbane, California

Parameter	Symbol	Value	Units	Reference
Fraction of floor through which chemical can enter	F	1	unitless	VDEQ default, (VDEQ, 2019)
Length of trench	L	12	feet	reasonable assumption
Width of trench	W	4	feet	reasonable assumption
Depth of Trench	D	10	feet	reasonable assumption
Area of side walls and floor of trench	A	34.19	m^2	calculated; 4 walls and floor
Volume of trench	V	13.59	m^3	calculated; height x width x depth
Air exchange	ACH	2	1/hour	VDEQ default, (VDEQ, 2019)
Distance between trench sides/bottom and soil vapor source	L_d	15.24	cm	0.5 foot - reasonable assumption
Volumetric air content in vadose zone	θ_A	0.28	cm^3/cm^3	U.S. EPA default values (RSLs, 2019)
Total porosity in vadose zone	θ_T	0.43	cm^3/cm^3	U.S. EPA default values (RSLs, 2019)

Notes and Abbreviations::
[1] Virginia Department of Environmental Quality (VDEQ). 2019. Voluntary Remediation Program - Risk Assessment Guidance

VOCs	CAS Number	Diffusivity in Air Dia (cm^2/s)	Volatilization Factor VF_{trench} (unitless)
1,1,1-Trichloroethane	71-55-6	6.5E-02	1.5E-02
1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1	3.8E-02	8.7E-03
1,1-Dichloroethane	75-34-3	8.4E-02	1.9E-02
1,1-Dichloroethene	75-35-4	8.6E-02	2.0E-02
1,2,3-Trichlorobenzene	87-61-6	4.0E-02	9.2E-03
1,2,4-Trimethylbenzene	95-63-6	6.1E-02	1.4E-02
1,2-Dichlorobenzene	95-50-1	5.6E-02	1.3E-02
1,3,5-Trimethylbenzene	108-67-8	6.0E-02	1.4E-02
4-Isopropyltoluene	99-87-6	7.8E-02	1.8E-02
Acetone	67-64-1	1.1E-01	2.5E-02
Benzene	71-43-2	9.0E-02	2.1E-02
Chloroethane	75-00-3	1.0E-01	2.3E-02
cis-1,2-Dichloroethene	156-59-2	8.8E-02	2.0E-02
Ethylbenzene	100-41-4	6.8E-02	1.6E-02
Isopropylbenzene	98-82-8	6.0E-02	1.4E-02
Methyl-tert-butyl ether (MTBE)	1634-04-4	7.5E-02	1.7E-02
Naphthalene	91-20-3	6.0E-02	1.4E-02
n-Butylbenzene	104-51-8	5.3E-02	1.2E-02
n-Propylbenzene	103-65-1	6.0E-02	1.4E-02
sec-Butylbenzene	135-98-8	5.3E-02	1.2E-02
Styrene	100-42-5	7.1E-02	1.6E-02
Tetrachloroethene (PCE)	127-18-4	5.0E-02	1.2E-02
Toluene	108-88-3	7.8E-02	1.8E-02
trans-1,2-Dichloroethene	156-60-5	8.8E-02	2.0E-02
Trichloroethene (TCE)	79-01-6	6.9E-02	1.6E-02
Vinyl Chloride	75-01-4	1.1E-01	2.5E-02
Xylenes, Total	1330-20-7	6.9E-02	1.6E-02
TPH-Gasoline (C4-C12)	---	7.3E-02	1.7E-02

APPENDIX D
Particulate Action Levels

APPENDIX D

This Appendix describes the methods to estimate action levels for respirable particulate matter, including particles 10 microns in diameter (PM_{10}) and chemicals of potential concern (COPC) adhered to dust, that may be present in air along the perimeter of the Site during work hours. The action levels were developed using risk-based procedures that are consistent with Environmental Protection Agency (EPA) guidelines to protect human health for intermediate exposures [EPA, 1989] in order to reduce the possibility of adverse health impacts to nearby off-site receptors. Procedures will be in place to monitor for the presence of respirable particulate matter along the perimeter of the project Site and samples will be collected to compare concentrations to action levels. Appropriate corrective measures will be implemented if the action levels are exceeded.

Particulate Action Level (PM_{10})

Airborne particles can be classified by their particle diameter and health effects. Large particles typically settle out of the air rapidly and pose a limited health risk, but small particles may remain in the air for longer time periods and can penetrate deeply into the human respiratory system where they can cause harmful health effects. Particles 10 microns or smaller in diameter (PM_{10}) and particles 2.5 microns or smaller in diameter ($PM_{2.5}$) (i.e., respirable particles) pose the greatest health risk because they can penetrate deeply into the human respiratory system.

There are two forms of PM standards – annual and 24-hour. The annual standard is designed to cap individuals' total PM exposure; the 24-hour standard is designed to protect individuals' peak PM exposure.

National Ambient Air Quality Standards (NAAQS) and the California Ambient Air Quality Standard (CAAQS) are designed to protect the general public from airborne particulates generated in the urban, suburban and rural environments. The current 24-hour standards are:

- National Ambient Air Quality Standard (NAAQS):
    - PM_{10} - 150 micrograms per cubic meter ($\mu g/m^3$) average per 24 hour day (not to be exceeded more than once per year on average over 3 years); and
    - $PM_{2.5}$ - 35 $\mu g/m^3$ average per 24-hour day (98th percentile, averaged over 3 years).
- California Ambient Air Quality Standard (CAAQS):
    - PM_{10} - 50 $\mu g/m^3$ average per 24-hour day; and
    - $PM_{2.5}$ - NA (currently, California has no 24-hour $PM_{2.5}$ standard.).

The recommended action level for respirable dust (PM_{10}), which will trigger a modification in the activity or an increase in dust suppression efforts, is based on the CAAQS of 50 $\mu g/m^3$.

Available data from Bay Area air monitoring stations indicate that annual average regional background PM_{10} concentrations are approximately 20 $\mu g/m^3$ or less [Bay Area Air Quality

Management District (BAAQMD), 2011]. For this evaluation, a concentration of 20 µg/m^3 is a reasonable estimation of average background PM_{10} concentrations at the Site.

Considering background concentrations, average PM_{10} concentrations up to 0.11 mg/m^3 for an 8-hour workday would likely result in the achievement of the 0.05 mg/m^3 24-hour TWA (50 µg/m^3) standard at the Site perimeter. The calculated value of 0.11 mg/m^3 for an 8-hour work shift (see Equation 1) assumes that the PM_{10} concentration is 0.02 mg/m^3 (20 µg/m^3) for 16 hours of the non-work day, resulting in a calculated hypothetical 24-hour TWA PM_{10} concentration of 0.05 mg/m^3. Therefore, the selected 8-hour TWA airborne Action Level for PM_{10} dust is 0.11 mg/m^3 (**Table D-1**).

Equation 1: Calculation of 8-hour TWA PM10 for an 8-hour Shift

$$PM10_{8-hour-TWA} = \frac{24 * PM10_{24-hour-TWA} - 16 * PM10_{background}}{8}$$

Where:

$PM10_{8\text{-hour-TWA}}$ = 8-hour TWA PM10 for an 8-hour shift [mg/m^3]
$PM10_{24\text{-hour-TWA}}$ = 24-hour TWA PM10 [0.05 mg/m^3]
$PM10_{background}$ = Background PM10 [0.02 mg/m^3]

In the event of high wind days or if the upwind 8-hour PM_{10} average concentration is greater than 0.11 mg/m^3, the measured upwind concentration will be subtracted from the measured downwind concentration to determine the net ground level (NGL) concentration. The NGL will be compared with the project PM_{10} action level (0.11 mg/m^3).

COPCs Action Levels in Dust from Soil

For risk-driving COPCs identified in soil from the Site (arsenic, lead, total petroleum hydrocarbons as diesel [TPHd], and tetrachloroethene [PCE]), the more stringent of (1) the short-term (8-hour) Reference Exposure Level (REL), as available; and (2) the calculated risk-based airborne action levels based on carcinogenic and noncarcinogenic endpoints for off-site receptors, using EPA (2020) and DTSC (2020) guidance, are selected as the COPC airborne action levels. These estimated action levels assume direct inhalation and are conservative in that they do not consider the potential for dilution from chemicals in air between the Site perimeter and off-Site locations.

Available chronic RELs for non-carcinogenic hazards, inhalation unit risk (IUR) factors for carcinogenic risk, and exposure parameters are discussed below. The toxicity values were obtained from guidance documents published by the DTSC (HERO Note 10; DTSC 2019) and the EPA RSLs (EPA, 2020).

Exposure parameters used to calculate action levels in air were selected based on available DTSC and EPA guidance or on professional judgment for work day exposures (**Table D-2)**.

- Exposure Frequency – The assumed exposure frequency (EF) for the potential off-Site receptors is 60 days/year (i.e., 3 months; 12 weeks; 5 days/week).

- Exposure Time – For the inhalation exposure pathway, a key parameter is the assumed exposure time (ET), expressed as hours per day (hrs/day). The ET indicates the amount of time a member of the hypothetical population may spend each day in an area where airborne COPCs occur in ambient air. The ET is assumed to be 8 hours/day.

- Averaging Time and Exposure Duration – For estimating the chronic daily intake for non-carcinogenic adverse health effects, the averaging time (AT) is assumed to be equal to the exposure duration (ED) in units of days. For this analysis, the assumed time is 60 days/year (3 months, 12 weeks, 5 days/week). The AT and ED are 60 days and 0.23 years, respectively. For estimating carcinogenic risk, averaging time is assumed to be a lifetime of 70 years (EPA, 1989).

Non-Carcinogenic Risk-Based Airborne Exposure Level

The non-carcinogenic risk-based airborne Action Level was calculated using Equation 2 below (EPA, 2009) and a Target Hazard Index (THI) of one (1) (**Table D-2**). The THI is the non-carcinogenic hazard of an individual airborne COPC through a particular exposure pathway, and a total THI less than or equal to one (1) represents an exposure that is unlikely to cause adverse non- carcinogenic health effects, even for sensitive populations (EPA, 1989). In Equation 2, "respirable chemical" is the amount of non-volatile chemical associated with the PM10 fraction of airborne dust:

Equation 2: Respirable Dust Action level for Non-Carcinogenic Airborne COCs

$$AL = \frac{THI * AT_{nc} * (REL\ or\ RfC)}{EF * ED * ET * \left(\frac{1day}{24hours}\right)}$$

Where:

AL = Action Level – respirable chemical concentration in Site ambient air that is unlikely to cause adverse non- carcinogenic health effects [mg/m^3];
THI = Target Hazard Index – target non-carcinogenic hazard of 1 [dimensionless];
AT_{nc} = Averaging time (ED * 365 days/year) [days];
REL = Reference exposure level [µg/m^3]
RfC = Reference concentration [µg/m^3]
EF = Assumed exposure frequency [days/yr]
ED = Assumed exposure duration [yr]
ET = Exposure time [hrs/day]

Carcinogenic Risk-Based Airborne Exposure Level

The carcinogenic risk-based airborne action levels for carcinogenic COPCs were calculated using Equation 2 below and a lifetime incremental cancer risk of one-in-one million (1×10^{-6}) (**Table D-2**). An incremental cancer risk of 1×10^{-6} is the lower bound of the incremental cancer risk range of 1×10^{-6} to one in ten thousand (1×10^{-4}) that the EPA defines as "safe and protective" of human health (EPA, 1991). In Equation 2, "respirable chemical" is the amount of non-volatile chemicals associated with the PM10 fraction of airborne dust.

Equation 2: Respirable Dust Action Level for Carcinogenic Airborne COCs

$$AL = \frac{TR * AT_c}{EF * EDc * ET * IUR * \left(\frac{1day}{24hours}\right)}$$

Where:

AL = Action Level – respirable chemical concentration in site ambient air that is unlikely to cause adverse carcinogenic health effects (mg/m^3)

TR = Target lifetime incremental cancer risk of 10^{-6} (dimensionless)

AT_c = Averaging time (70 years * 365 days/year) (days)

EF = Assumed exposure frequency (days/year)

ED = Assumed exposure duration (year)

ET = Exposure time (hours/day)

IUR = Inhalation unit risk ($[\mu g/m^3]^{-1}$)

COPC Airborne Action Level

Concentrations of risk-driving COPCs in dust were calculated using Equation 3 to evaluate whether the 8-hour TWA airborne Action Level for PM10 dust of 0.11 mg/m^3 would be protective of off-site populations.

Equation 3: Respirable Dust Action Level for Identified Airborne COCs

$$D = \frac{AL}{COC_{max}\ or\ COC_{95UCL} * 10^{-6} kg/mg}$$

Where:

D = maximum hypothetical concentration of PM10 Dust [mg/m^3]

AL = airborne Action Level [mg/m^3]

$COPC_{95UCL}$ = estimated 95% UCL of the mean in soil samples from the site [mg/kg]

As indicated in **Table D-2**, the risk-driving COPC with the lowest dust action level is lead. Based on the 95% UCL for lead (1,320 mg/kg), the calculated action level for respirable lead is 1.14 mg/m^3 (8-hr TWA) based on the airborne action level of 1.5 µg/m^3 (**Table D-2)**. This calculated action level for respirable lead is less stringent than the 8-hour workday TWA of 0.11 mg/m^3 for PM10; therefore, the project respirable action of level of 0.11 mg/m^3 (110 µg/m^3) for PM10 can be used to limit concentrations of non-volatile risk-based COPCs as well as PM10. Maintaining respirable particulates below 0.11 mg/m^3 will ensure that both PM10 emissions and risk-based COPC dust particulates from the project will not reasonably cause the 24-hour TWA for PM10 or the risk-based concentrations to be exceeded.

References

Bay Area Air Quality Management District, "*Trends in Bay Area Ambient Particulates,*" BAAQMD, November 2011.

DTSC, 2020. Human Health Risk Assessment Note 3, DTSC-Modified Screening Levels, June.

DTSC, 2019. Human Health Risk Assessment Note 10 – Toxicity Criteria, February.

United States Environmental Protection Agency (EPA), "*Risk Assessment Guidance for Superfund,*" Vol. 1: Human Health Evaluation Manual (Part A), Interim Final, EPA/540/1-89/002," December 1989.

United States Environmental Protection Agency, "*Regional Screening Levels,*" May 2020.

TABLE D-1
COMPARISON OF AIRBORNE ACTION LEVELS FOR PM10 AND OTHER COPCs
UPC OU-2
Brisbane, California

Airborne Dust	CAAQS or NAAQS Regulatory Level[a] (mg/m^3)	Selected Airborne Action Level	
		Concentration (mg/m^3)	Time Period
Dust			
PM10 Dust[c]	0.05 (24-hour avg)	0.054	8-hour avg
Risk-Driving COPCs			
Arsenic	NA	14.2	8-hour avg
Lead	1.5	1.14	8-hour avg
Carcinogenic PAHs and other COPCs	NA	9.60	8-hour avg

Abbreviations:

avg = average

BAAQMD = Bay Area Air Quality Management District

CAAQS = California Ambient Air Quality Standards

NA = Not Available

Notes:

[a] The CAAQS and NAAQS are referenced in California Code of Regulations, Title 17, Section 70200 and in Title 40, Part 50 of the Code of Federal Regulations, respectively.

[b] To account for short-term variations in dust emissions, a 5-minute TWA of 1 mg/m^3, which approximately corresponds to that of visible dust, will serve as the stop work Target Level. If this Target Level is exceeded at air monitoring stations during excavation activities, work will be temporarily stopped to reassess Site activities and dust suppression efforts. Additionally, a PM10 cconcentration of approximately two times the PM10 Action Level estimated as a 5-minute TWA during hourly inspections of air monitors will result in an increase in dust suppression efforts.

[c] The respirable dust (PM10) Action Level is established from the CAAQS for PM10, which is a 24-hour TWA, and is calculated for an 8-hour TWA during the workday by using average ambient background concentrations during non-workday hours.

TABLE D-2
ACTION LEVELS FOR RISK-DRIVING COCs[1]
UPC OU-OU2
Brisbane, California

Risk-Driving Constituents of Concern (COC)	Soil Concentration[2] (mg/kg)	Toxicity Value	Toxicity Value (units)	Source of Toxicity Value	Risk-Based Airborne Action Level [1] ($\mu g/m^3$)	Source[(a)]	Dust Action Level [3] (mg/m^3)
Arsenic (noncancer)	58.0	1.5E-02	($\mu g/m^3$)	OEHHA	0.82	calculated	14.16
Arsenic (cancer)	58.0	4.3E-03	($\mu g/m^3$)$^{-1}$	IRIS	0.89	calculated	15.37
Lead	1,320	NA			1.5	CAAQS	1.14
TPHd	370	2.6E+02	($\mu g/m^3$)	OEHHA	14,235	calculated	38,473
PCB-1260	0.1	5.7E-04	($\mu g/m^3$)$^{-1}$	OEHHA	6.72	calculated	73,887

Notes and Abbreviations:

mg/kg - milligrams per kilogram

$\mu g/m^3$ - micrograms per meter cubed

mg/m^3 - milligrams per meter cubed

OEHHA = Office of Environmental Health Hazard Assessment Reference Exposure Levels

NA = Not Available

[1] Risk-based concentrations calculated based on a target hazard index and carcinogenic risk using the toxicity values and exposure parameters presented below.

[2] The 95 percent upper confidence limit of the mean is presented.

[3] Respirable dust action levels for individual chemical compounds were calculated using the following equation:

Dust action level = (RBC_{air} / 1000 $\mu g/mg$ ⁄ (C_{soil} x 10^{-6} kg/mg)

Exposure Parameter	Symbol	Value	Units	Notes
Target Hazard Index	THI	1	unitless	Default point of departure
Target Cancer Risk	TR	1E-06	unitless	Default point of departure
Averaging Time noncancer	ATnc	20	days	acute total duration - (3 months; 12 weeks, 5 days/week)
Averaging Time carcinogenic	ATc	25,550	days	Default - lifetime exposure
Exposure Frequency	EF	20	days/year	assumed 6 days/week for 17 weeks
Exposure Duration - noncancer	EDnc	0.055	year	acute duration - 12 weeks / 52 weeks
Exposure Duration - carcinogenic	EDc	1	year	chronic - conservative 1-year duration
Exposure Time	ET	0.33	hrs/day	8 hour work day over 24 hours
Conversion Factor	CF	1.00	day/hr	Conversion factor

APPENDIX E
Estimated Cost Summary Tables for Remedial Alternatives

Appendix E
Estimated Cost Summary Table for Remedial Alternatives
Brisbane Baylands OU-2
Brisbane, California

REMEDIAL ALTERNATIVE	CAPITAL COST	O&M COST	TOTAL COST
ALTERNATIVE 1 No Action	$0	$0	$0
ALTERNATIVE 2 Land Use Restrictions / Vapor Intrusion Mitigation / Monitored Natural Attenuation	$1,200,000	$6,900,000	$8,100,000
ALTERNATIVE 3 Land Use Restrictions / Vapor Intrusion Mitigation / Soil Capping / Soil Excavation with Relocation and/or Offsite Disposal / In Situ Groundwater Treatment and Monitoring	$33,300,000	$6,900,000	$40,200,000
ALTERNATIVE 3 (PLUS OPTIONAL SOIL TREATMENT) Land Use Restrictions / Vapor Intrusion Mitigation / Soil Capping / Soil Excavation with Relocation and/or Offsite Disposal / In Situ Groundwater Treatment and Monitoring / Onsite Ex Situ Soil Treatment	$36,400,000	$6,900,000	$43,300,000
ALTERNATIVE 4 Land Use Restrictions / Vapor Intrusion Mitigation / Complete Excavation with Offsite Disposal / Restoring to Original Grade / In Situ Groundwater Treatment and Monitoring	$194,600,000	$6,900,000	$201,500,000

Notes:

1) These cost estimates are for comparison purposes only, include a contingency rate of 20%, and have an accuracy of +50/-30%.

2) Cost estimates will be refined following completion of remedial design.

3) Costs to implement and maintain land-use controls and groundwater monitoring will be covered under existing property management programs.

4) Capital and O&M Costs may not equal Total Costs due to rounding.

Appendix E-1A
Estimated Cost Summary Table for Remedial Alternative 2
Brisbane Baylands OU-2
Brisbane, California

	TASK		COST ESTIMATE
	LAND USE RESTRICTIONS		
1)	Land Use Covenant - Years 1 through 30	$	1,710,000
	VAPOR INTRUSION MITIGATION		
2a)	Soil Vapor Investigation	$	500,000
2b)	Vapor Intrusion Mitigation Design and Construction	$	400,000
2c)	Inspection and Monitoring - Years 1 through 30	$	2,303,000
	GROUNDWATER MONITORING		
3)	Groundwater Monitoring - Years 1 through 30	$	1,870,000
	SUBTOTAL	$	6,780,000
	Contingency (20%)	$	1,360,000
	TOTAL	**$**	**8,140,000**

Notes:

1) These cost estimates are for comparison purposes only, and have an accuracy of +50/-30%.
2) Cost estimates will be refined following completion of remedial design.
3) Costs to implement and maintain land-use restrictions will be covered under existing property management programs.
4) Subtotals may not equal Total due to rounding.
5) Import related to redevelopment not included.

Appendix E-1B
Estimated Cost Summary Backup Table for Remedial Alternative 2
Brisbane Baylands OU-2
Brisbane, California

Task 1 - Land Use Covenant - Years 1 through 30

Preparation of document restricting reuses of the Site that would pose a risk, for recording by San Mateo County.

Task	Qty	Unit	Rate	Capital Cost	O&M Cost
Prepare Covenant Including Legal Support (Year 1)	1	each	$100,000	$100,000	$0
LUC Annual Inspections (Years 2 through 30)	1	event/yr	$70,000	$0	$1,612,000
			Discount Rate:	**1.5%**	
			Total Task 1:	**$1,710,000**	

Task 2 - Vapor Intrusion Mitigation - Years 1 through 30

Vapor intrusion mitigation through the use of vapor barriers or sub-slab venting systems.

Task	Qty	Unit	Rate	Capital Cost	O&M Cost
Soil Vapor Investigation	1	each	$500,000	$500,000	$0
VI Mitigation Design	1	each	$100,000	$100,000	$0
Construction of Mitigation System	1	each	$300,000	$300,000	$0
Inspections and Quarterly Monitoring (Years 2 through 30)	4	event/yr	$25,000	$0	$2,303,000
			Discount Rate:	**1.5%**	
			Total Task 2:	**$3,200,000**	

Task 3 - Monitored Natural Attenuation - Years 1 Through 30

On-going groundwater monitoring with expansion of the monitoring well network to include the chlorinated volatile organic compound impacts north of the former Oil Tank area.

Task	Qty	Unit	Rate	Capital Cost	O&M Cost
Expansion of Monitoring Well Network	1	each	$25,000	$25,000	$0
Quarterly Monitoring and Reporting (Years 2 through 30)	4	event/yr	$20,000	$0	$1,842,000
			Discount Rate:	**1.5%**	
			Total Task 3:	**$1,870,000**	

Subtotal	$6,780,000
Contingency (20%)	$1,360,000
TOTAL	**$8,140,000**

Notes:

1) Discount rate is based on a 30-Yr Nominal Interest Rate on US Treasure Notes & Bonds (OMB Circular No. A-94, App C, Nov 2019).
2) Actual scope for vapor intrusion mitigation is unknown until soil vapor sampling is completed. Placeholder in cost estimate for purpose of comparing alternatives.

Appendix E-2A
Estimated Cost Summary Table for Remedial Alternative 3
Brisbane Baylands OU-2
Brisbane, California

TASK		COST ESTIMATE	
	LAND USE RESTRICTIONS		
1)	Land Use Covenant - Years 1 through 30	$	1,710,000
	VAPOR INTRUSION MITIGATION		
2a)	Soil Vapor Investigation	$	500,000
2b)	Vapor Intrusion Mitigation Design and Construction	$	400,000
2c)	Inspection and Monitoring - Years 1 through 30	$	2,303,000
	SOIL CAPPING		
3)	Soil Capping	$	23,680,000
	SOIL EXCAVATION WITH RELOCATION AND/OR OFFSITE DISPOSAL		
4a)	Soil Excavation and Relocation	$	180,000
4b)	Soil Excavation and Offsite Disposal		2,090,000
	GROUNDWATER TREATMENT AND MONITORING		
5a)	In Situ Groundwater Treatment	$	750,000
5b)	Groundwater Monitoring - Years 1 through 30	$	1,870,000
	SUBTOTAL	$	33,480,000
	Contingency (20%)	$	6,700,000
	TOTAL	**$**	**40,180,000**
	ONSITE EX SITU SOIL TREATMENT (OPTIONAL)		
6)	Onsite Ex Situ Soil Treatment	$	2,640,000
	SUBTOTAL WITH OPTIONAL TASK 6	$	36,120,000
	Contingency (20%)	$	7,220,000
	TOTAL WITH OPTIONAL TASK 6	**$**	**43,340,000**

Notes:

1) These cost estimates are for comparison purposes only, and have an accuracy of +50/-30%.
2) Cost estimates will be refined following completion of remedial design.
3) Costs to implement and maintain land-use restrictions will be covered under existing property management programs.
4) Subtotals may not equal Total due to rounding.

Appendix E-2B
Estimated Cost Summary Backup Table for Remedial Alternative 3
Brisbane Baylands OU-2
Brisbane, California

Task 1 - Land Use Covenant - Years 1 through 30

Preparation of document restricting reuses of the Site that would pose a risk, for recording by San Mateo County.

Task	Qty	Unit	Rate	Capital Cost	O&M Cost
Prepare Covenant Including Legal Support (Year 1)	1	each	$100,000	$100,000	$0
LUC Annual Inspections (Years 2 through 30)	1	event/yr	$70,000	$0	$1,612,000
			Discount Rate:	**1.5%**	
			Total Task 1:	**$1,710,000**	

Task 2 - Vapor Intrusion Mitigation - Years 1 through 30

Vapor intrusion mitigation through the use of vapor barriers or sub-slab venting systems.

Task	Qty	Unit	Rate	Capital Cost	O&M Cost
Soil Vapor Investigation	1	each	$500,000	$500,000	$0
VI Mitigation Design	1	each	$100,000	$100,000	$0
Construction of Mitigation System	1	each	$300,000	$300,000	$0
Inspections and Quarterly Monitoring (Years 2 through 30)	4	event/yr	$25,000	$0	$2,303,000
			Discount Rate:	**1.5%**	
			Total Task 2:	**$3,200,000**	

Task 3 - Soil Capping

Placement and compaction of clean fill (5 feet in depth) over the entire 140-acre site (i.e., 1,030,630 bank cubic yards of import fill with a 1.2 bulking factor). Loose imported fill (assumed bulking factor of 1.2) will be compacted in 6-inch lifts.

Task	Qty	Unit	Rate	Capital Cost	O&M Cost
Loose Import Fill Characterization	1,237	sample	$1,500	$1,855,500	$0
Loose Import Fill Transportation Cost	1,237,000	Bulk CY	$15	$18,555,000	$0
Demarcation Fabric (4,500 square feet)	1,355	each	$600	$813,000	$0
Placement and Compaction	614	days	$4,000	$2,456,000	$0
			Total Task 3:	**$23,680,000**	

Task 4a - Soil Excavation and Relocation

In the event the final development plan requires removal of impacted soil prior to capping, for example in an area where placement of 5 feet of cap would exceed design grade, the excavated soil will be relocated onsite and subsequently capped as described in Task 3. For costing purposes, 12,000 bulk cubic yards of soil was assumed to require excavation and relocation.

Task	Qty	Unit	Rate	Capital Cost	O&M Cost
Soil Excavation and Relocation	12,000	Bulk CY	$15	$180,000	$0
			Total Task 4a:	**$180,000**	

Task 4b - Soil Excavation and Offsite Disposal

Excavation and offsite disposal of approximately 12,000 bulk cubic yards of impacted soil; 9,600 cubic yards were assumed to be non-RCRA California hazardous and 2,400 cubic yards were assumed to be hazardous. Assumed 1.5 tons per cubic yard for surficial soil.

Task	Qty	Unit	Rate	Capital Cost	O&M Cost
Soil Excavation, Stockpiling, and Loose Characterization	12,000	Bulk CY	$15	$180,000	$0
Offsite Disposal (Non-hazardous, Altamont Landfill)	14,400	TON	$90	$1,296,000	$0
Offsite Disposal (Hazardous, Buttonwillow Landfill)	3,600	TON	$170	$612,000	$0
			Total Task 4b:	**$2,090,000**	

Appendix E-2B
Estimated Cost Summary Backup Table for Remedial Alternative 3
Brisbane Baylands OU-2
Brisbane, California

Task 5 - In Situ Groundwater Treatment and Monitoring - Years 1 Through 11

Treatment of chlorinated VOCs north of former Oil Tank by two rounds of in situ injections; on-going site-wide groundwater monitoring with expansion of the monitoring well network to include the treatment area.

Task	Qty	Unit	Rate	Capital Cost	O&M Cost
In Situ Treatment of Chlorinated VOCs	1.5	each	$500,000	$750,000	$0
Expansion of Monitoring Well Network	1	each	$25,000	$25,000	$0
Quarterly Monitoring and Reporting (Years 2 through 30)	4	event/yr	$20,000	$0	$1,842,000
			Discount Rate:	**1.5%**	
			Total Task 5:	**$2,620,000**	

Task 6 - Soil Excavation and Onsite Ex Situ Treatment (Optional)

Excavation and treatment of approximately 12,000 bulk cubic yards of soil containing potentially mobile separate-phase petroleum hydrocarbons. Treated soil will be reused onsite.

Task	Qty	Unit	Rate	Capital Cost	O&M Cost
Loose Soil Handling (Excavation, stockpiling, and backfilling)	12,000	Bulk CY	$20	$240,000	$0
Ex Situ Thermal Treatment	12,000	Bulk CY	$200	$2,400,000	$0
			Total Task 6:	**$2,640,000**	

Tasks 1 through 5 Only	
Subtotal	$33,480,000
Contingency (20%)	$6,700,000
TOTAL	**$40,180,000**
All Tasks (including Optional Task 6)	
Subtotal	$36,120,000
Contingency (20%)	$7,220,000
TOTAL	**$43,340,000**

Notes:
1) Discount rate is based on a 30-Yr Nominal Interest Rate on US Treasure Notes & Bonds (OMB Circular No. A-94, App C, Nov 2019).
2) Actual scope for vapor intrusion mitigation is unknown until soil vapor sampling is completed. Placeholder in cost estimate for purpose of comparing alternatives.

Appendix E-3A
Estimated Cost Summary Table for Remedial Alternative 4
Brisbane Baylands OU-2
Brisbane, California

	TASK		COST ESTIMATE
	LAND USE RESTRICTIONS		
1)	Land Use Covenant - Years 1 through 30	$	1,710,000
	VAPOR INTRUSION MITIGATION		
2a)	Soil Vapor Investigation	$	500,000
2b)	Vapor Intrusion Mitigation Design and Construction	$	400,000
2c)	Inspection and Monitoring - Years 1 through 30	$	2,303,000
	EXCAVATION W/ DISPOSAL AND RESTORING TO ORIGINAL GRADE		
3)	Soil Excavation and Off-Site Disposal	$	144,954,000
4)	Restoring to Original Grade	$	15,404,000
	GROUNDWATER TREATMENT AND MONITORING		
5a)	In Situ Groundwater Treatment	$	750,000
5b)	Groundwater Monitoring - Years 1 through 30	$	1,870,000
	SUBTOTAL	$	167,900,000
	Contingency (20%)	$	33,580,000
	TOTAL	**$**	**201,500,000**

Notes:

1) These cost estimates are for comparison purposes only, and have an accuracy of +50/-30%.
2) Cost estimates will be refined after the remedial design is completed.
3) Costs to implement and maintain land-use restrictions will be covered under existing property management programs.
4) Subtotals may not equal Total due to rounding.

Appendix E-3B
Estimated Cost Summary Backup Table for Remedial Alternative 4
Brisbane Baylands OU-2
Brisbane, California

Task 1 - Land Use Covenant - Years 1 through 30

Preparation of a land use covenant to prevent human exposure to contaminants left in place in groundwater and soil-gas, for recording by San Mateo County.

Task	Qty	Unit	Rate	Capital Cost	O&M Cost
Prepare Covenant Including Legal Support (Year 1)	1	each	$100,000	$100,000	$0
LUC Annual Inspections (Years 2 through 30)	1	event/yr	$70,000	$0	$1,612,000
			Discount Rate:	**1.5%**	
			Total Task 1:	**$1,710,000**	

Task 2 - Vapor Intrusion Mitigation - Years 1 through 30

Vapor intrusion mitigation through the use of vapor barriers or sub-slab venting systems.

Task	Qty	Unit	Rate	Capital Cost	O&M Cost
Soil Vapor Investigation	1	each	$500,000	$500,000	$0
VI Mitigation Design	1	each	$100,000	$100,000	$0
Construction of Mitigation System	1	each	$300,000	$300,000	$0
Inspections and Quarterly Monitoring (Years 2 through 30)	4	event/yr	$25,000	$0	$2,303,000
			Discount Rate:	**1.5%**	
			Total Task 2:	**$3,200,000**	

Task 3 - Soil Excavation and Offsite Disposal

Excavation of all soil with constituent of concern (COC) concentrations above cleanup levels to a maximum depth of fourteen feet below ground surface. The excavated soil will be excavated and transported offsite for disposal. Excavations will be backfilled with soil as described in Task 3. Under this scenario, approximately 694,224 bank cubic yards of soil would be excavated and hauled offsite for disposal (assumed bulking factor of 1.2); 80% of soil was assumed to be non-hazardous and 20% of soil was assumed to be non-RCRA California hazardous. Assumed 1.5 tons per CY for surficial soil.

Task	Qty	Unit	Rate	Capital Cost	O&M Cost
Soil Excavation, Stockpiling, and Loose Characterization	833,069	Bulk CY	$15	$12,496,032	$0
Offsite Disposal (Non-hazardous, Altamont)	999,683	TON	$90	$89,971,430	$0
Offsite Disposal (Hazardous, Buttonwillow)	249,921	TON	$170	$42,486,509	$0
			Total Task 2:	**$144,954,000**	

Task 4 - Restoring to Original Grade

Placement and compaction of clean imported fill to original grade (i.e., 694,224 bank cubic yards). Loose imported fill (assumed bulking factor of 1.2) will be compacted in 6-inch lifts. Assume that every 1,000 CY of imported soil will be characterized and that fill can be placed and compacted at a rate of 2,000 CY per day.

Task	Qty	Unit	Rate	Capital Cost	O&M Cost
Final Volume of Compacted Soil Cap	694,224	Bank CY	--	--	--
Volume of Loose Import Fill Required	833,069	Bulk CY	--	--	--
Loose Import Fill Transportation	833,069	Bulk CY	$15	$12,496,032	$0
Loose Import Fill Characterization	834	sample	$1,500	$1,251,000	$0
Placement and Compaction of Fill	414	days	$4,000	$1,656,000	$0
			Total Task 3:	**$15,404,000**	

Appendix E-3B
Estimated Cost Summary Backup Table for Remedial Alternative 4
Brisbane Baylands OU-2
Brisbane, California

Task 5 - In Situ Groundwater Treatment and Monitoring - Years 1 Through 30

Treatment of chlorinated VOCs north of former Oil Tank by two rounds of in situ injections; on-going site-wide groundwater monitoring with expansion of the monitoring well network to include the treatment area.

Task	Qty	Unit	Rate	Capital Cost	O&M Cost
In Situ Treatment of Chlorinated VOCs	1.5	each	$500,000	$750,000	$0
Expansion of Monitoring Well Network	1	each	$25,000	$25,000	$0
Quarterly Monitoring and Reporting (Years 2 through 30)	4	event/yr	$20,000	$0	$1,842,000
			Discount Rate:	**1.5%**	
			Total Task 5:	**$2,620,000**	

Subtotal	$167,890,000
Contingency (20%)	$33,580,000
TOTAL	**$201,500,000**

Notes:
1) Discount rate is based on a 30-Yr Nominal Interest Rate on US Treasure Notes & Bonds (OMB Circular No. A-94, App C, Nov 2019).
2) Actual scope for vapor intrusion mitigation is unknown until soil vapor sampling is completed. Placeholder in cost estimate for purpose of comparing alternatives.
3) Subtotals may not equal total due to rounding.

APPENDIX F
Import Soil Criteria

BSP
Baylands Soil Processing, llc

Submittal Guidelines for Imported Soil

The following guidelines are provided as a prescriptive step process to ensure the contractual and regulatory requirements for Baylands Soil Processing are met and the appropriate quality control documentation is provided in a timely manner. Please contact info@thebaylands.com for questions.

Soil Review & Acceptance Guidelines

1. **Complete Source Information Form (SIF)**
   a. SIF located at: http://thebaylands.com/import/
   b. Do not leave any area blank.
   c. Submit via email to info@thebaylands.com

2. **Determine Number of Samples by type of project**:
   a. Borrow Area (e.g., one common piece of property with the same use; commonly referred to as a Mass Excavation)
   b. Stockpile (e.g., pipelines, multiple locations, multiple uses on one site)

Sampling Requirements	
Borrow Area (aka Mass Excavation)	
2 acres or less	4 discreet samples
2 to 4 acres	Minimum 1 sample per ½ acre
4 to 10 acres	Minimum 8 samples
Greater than 10 acres	Minimum of 8 locations with 4 subsamples per location
Stockpile[1]	
Up to 1,000 cubic yards (CY)	1 sample per 250 CY
1,000 CY to 5,000 CY	4 samples for first 1,000CY's plus 1 sample for each additional 500 CY
Greater than 5,000 CY	12 samples for first 5,000CY's plus 1 sample for each additional 500 CY

1. Composite samples are acceptable provided they don't exceed 4:1 ratio.
   For example: 2-point (2:1) composite may represent up to 500 CY for stockpile material.
   4-point (4:1) composite may represent up to 1,000 CY for stockpile material.

3. **Testing:**

   a. Normally provided by contractor but can be performed by BSP staff at an additional cost. Contact BSP for pricing.

b. **ONLY** BSP Staff are allowed to conduct sampling and testing for materials located on BSP facilities. This includes materials imported beyond the estimated volume as shown on the Source Information Form.

c. Prior Environmental Reports may be used for preliminary screening; however, BSP requires laboratory testing performed within the past 6 months for purposes of review and approval.

d. Composited soil samples shall be analyzed for the following constituents:
   - VOCs, including MTBE4 and TPH – GRO (EPA Method 8260B);
   - SVOCs (EPA Method 8270C); **8270C SIM may be used to augment 8270C**
   - Organochlorine Pesticides (EPA Method 8081);
   - PCBs (EPA Method 8082);
   - TPH – D and MO7 (EPA Method 8015);
   - Chromium +6 (EPA Method 7199); and
   - 17 CAM metals (EPA Method 6000/7000 series):
     - antimony (EPA Method 6010B);
     - arsenic (EPA Method 200.8);
     - barium (EPA Method 6010B);
     - beryllium (EPA Method 6010B);
     - cadmium (EPA Method 6010B);
     - chromium (EPA Method 6010B);
     - cobalt (EPA Method 6010B);
     - copper (EPA Method 6010B);
     - lead (EPA Method 6010B);
     - mercury (EPA Method 7470A);
     - nickel (EPA Method 6010B);
     - selenium (EPA Method 6010B);
     - silver (EPA Method 6010B);
     - thallium (EPA Method 6010B);
     - tin (EPA Method 6010B);
     - vanadium (EPA Method 6010B); and
     - zinc (EPA Method 6010B).
   - ph (EPA Mthod 9045C)

e. **Additional requirements**
   i. Maximum Detection Limits (MDL's) shall be included in lab reports for tests 8081, 8082 and 8270. MDL's shall be at or below the Environmental Screening Limits (ESL's) shown in Table 1 and Table 2.
   ii. If a CAM-17 TTLC test result is ten (10) times **greater** than its Table 2 value, BSP requires an STLC test to be submitted to determine soluble concentration. Results must be less than the STLC ESL's shown in Table 2 to be accepted.

iii. pH results that are less than 5 or greater than 10 may result in higher dump fees.
iv. Chain of Custody form to state if sample is a composite and the ratio (e.g., 1:2 or 4:1). BSP does not accept composites greater than 4:1.

4. Review Process

a. Submit SIF and Test Results from an ELAP certified laboratory for BSP review via email to: info@thebaylands.com
b. Material Review Notes:
    i. Summary tables are useful to facilitate review, but actual lab reports are required to confirm values.
    ii. If "Background" value in Table 1 is shown, the higher value between Background value and ESL shall be used to determine acceptance.
c. If the materials are deemed acceptable, BSP will issue a unique project ID number, Purchase Order and Soil Acceptance Letter stating conditions of approval including maximum import volume limit.
d. BSP will reply via email if the materials are unacceptable, or if corrective action is required to properly determine material acceptance.

ALTERNATIVE: At the sole discretion of BSP, materials may be imported into BSP's Material Containment Area (MCA) prior to approval provided that the Source Generator submits a letter acknowledging: (1) they are the Generator and (2) responsible for all associated cost should the materials found to be unacceptable. Letter shall be accompanied with preliminary test information sufficient for BSP to determine if materials can be imported into the MCA. All materials imported into the MCA are subject to confirmation testing by BSP at additional costs to the Generator, or as mutually agreed to by BSP and the Generator.

Submittal Guidelines for Imported Soil

Table 1

Environmental Screening Levels (ESLs)

For

Imported Materials

Table 1 Notes:
" -- " not applicable or not available; " mg/kg " milligrams per kilogram

If background value is available, the higher value between background and ESL shall be used.

* ESL not available; USEPA Risk-Based Soil Screening Levels (SSLs) for the protection of groundwater were used (4).

References:
(1) Background Metals Concentrations in Soil in Northern Santa Clara County (Scott, 1995)

(2) Analysis of Background Distributions of Metals in the Soil at Lawrence Berkeley National Laboratory (LBNL June 2002, Revised April 2009)

(3) All proposed concentrations are from California Regional Water Quality Control Board, San Francisco Bay Region (CRWQCB). Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater, Interim Final. rev June 2016. Minimum ESL between GW protection and Direct contact for soils < 3 meters below ground surface unless highlighted in red.

(4) USEPA, 2011. Regional Screening Levels (RSLs) for Chemical Contaminants at Superfund Sites.

(5) 95% Upper Confidence Limit of the Mean Concentration for Benzo(a)pyrene equivalents from Use of the Northern and Southern California Polynuclear Aromatic Hydrocarbon (PAH) Studies in the Manufactured Gas Plant Site Cleanup Process Draft for Public Comment – Cal-EPA May 8, 2009

(6) SF RWQCB Letter dated 9/14/17 regarding Concurrence with Proposed Revisions to the Baylands Soil Processing Acceptance Criteria, Brisbane Landfill, San Mateo County

BSP
Baylands Soil Processing, llc

Submittal Guidelines for Imported Soil

Table 1

Chemical	Background (mg/kg) (1)	BSP ESL (mg/kg) (3)
Inorganics		
Antimony	22	31
Arsenic (1)	11	11
Barium (2)	410	3000
Beryllium	3.2	42
Cadmium	14	39
Chromium	170	120,000
Chromium VI	-	0.3
Cobalt (2)	25	25
Copper	67	3,100
Lead (2)	54	80
Mercury	1.3	13
Molybdenum (2)	4.8	390
Nickel	145	150
Selenium (2)	4.9	390
Silver	4.8	390
Thallium	3.8	3.8
Vanadium (2)	90	390
Zinc	120	23,000

PAH's		
Chemical	**Background (mg/kg)**	**BSP ESL (mg/kg) (3)**
Acenaphthene	-	1.6
Acenaphthylene	-	13
Anthracene	-	2.8
Benzo[a]anthracene	-	0.16
Benzo[a]pyrene	0.4 (5)	0.4
Benzo[b]fluoranthene	-	0.16
Benzo[g,h,i]perylene	-	2.5
Benzo[k]fluoranthene	-	1.6
Chrysene	-	3.8
Dibenz[a,h]anthracene	-	0.016
Fluoranthene	-	60
Fluorene	-	8.9
Indeno[1,2,3-c,d]pyrene	-	0.16
Methylnaphthalene, 2	-	0.25
Naphthalene	-	0.03
Phenanthrene	-	11
Pyrene	-	85

Submittal Guidelines for Imported Soil

Table 1 Continued

Chemical	Background (mg/kg)	BSP ESL (mg/kg) (3)
Pesticides/PCBs		
4,4'-DDD	-	2.7
4,4'-DDE	-	1.9
4,4'-DDT	-	1.9
Aldrin		0.036
Aroclor 1248	-	0.23
Aroclor 1254	-	0.24
Aroclor 1260	-	0.24
Chlordane	-	0.48
Dieldrin	0.002(6)	0.002
Endosulfan I		0.0046
Endosulfan II		0.0046
Endosulfan sulfate		0.0046
Endrin	0.002(6)	0.002
Endrin aldehyde	0.002(6)	0.002
Endrin ketone	0.002(6)	0.002
Heptachlor	0.002(6)	0.002
Heptachlor epoxide	0.002(6)	0.002
Lindane	-	0.0098
Methoxychlor	-	19

SVOCs		
Chemical	**Background (mg/kg)**	**BSP ESL (mg/kg) (3)**
2,4,6-Trichlorophenol	-	0.21
2,4-Dichlorophenol	-	0.3
2,4-Dinitrotoluene	-	0.0018
Benzoic Acid		34*
Bis(2-Ethylhexyl) Phthalate	-	39
Butyl-benzyl-phthalate		0.51*
Diethyl phthalate	-	0.035
Dimethyl Phthalate	-	0.035
Hexachlorobutadiene		0.68
Hexachloroethane	-	1.1
Phenol	-	0.076

Submittal Guidelines for Imported Soil

Table 1 Continued

TPH	
Chemical	**BSP ESL (mg/kg) [3]**
TPH Gasoline (GRO) C6 - C10	100
TPH Diesel (DRO) C11- C28	230
TPH Motor oil C23 – C36	5,100

Chemical	Background (mg/kg)	BSP ESL (mg/kg) [3]
VOCs		
1,1,1,2-Tetrachloroethane	-	0.01
1,1,1-Trichloroethane	-	7.8
1,1,2,2-Tetrachloroethane	-	0.018
1,1,2-Trichloroethane	-	0.07
1,1-Dichloroethane	-	0.2
1,1-Dichloroethylene	-	0.55
1,2,4-Trichlorobenzene	-	1.5
1,2,4-Trimethylbenzene		0.081
1,2-Dibromo-3-chloropropane	-	0.0045
1,2-Dibromoethane	0.004[6]	0.00033
1,2-Dichlorobenzene	-	1.6
1,2-Dichloroethane	-	0.0045
1,2-Dichloropropane	-	0.12
1,3,5-Trimethylbenzene		0.087*
1,3-Dichloropropene	-	0.059
1,4-Dichlorobenzene	-	0.59
2,2-Dichloropropane		0.25*
2-Chlorotoluene		0.23
4-Isopropyltoluene (p-cymene)		1.1*
4-Methyl-2-pentanone (MIBK)	-	2.8
Acetone	-	0.5
Benzene	-	0.044
Bromodichloromethane	-	0.52
Bromoform	-	1.7
Bromomethane	-	0.3
Butylbenzene, n-		5.9*
Carbon disulfide		0.24
Carbon tetrachloride	-	0.048
Chlorobenzene	-	1.5
Chloroethane	-	1.1
Chloroform	-	0.68
Chloromethane (methyl chloride)	-	2.9
Dibromochloromethane	-	3.8
Dichloroethylene, cis-1,2	-	0.19

Submittal Guidelines for Imported Soil

Table 1 Continued

Chemical	Background (mg/kg)	BSP ESL (mg/kg) (3)
VOCs		
Dichloroethylene, trans-1,2	-	1
Ethylbenzene	-	1.4
Methyl ethyl ketone (2-butanone)	-	5.1
Methyl tert-butyl ether (MTBE)	-	0.023
Methylene chloride	-	0.077
Naphthalene	-	0.033
Propylbenzene, n-		1.2
Styrene	-	1.5
Tetrachloroethylene	-	0.42
Toluene	-	2.9
Trichloroethylene	-	0.46
Trichlorofluoromethane		0.838
Vinyl chloride	-	0.008
Xylene (total)	-	2.3

Table 2
STLC Limits for Imported Materials

Chemical	STLC (mg/L)
Antimony	15
Arsenic	5
Barium	100
Beryllium	0.8
Cadmium	1.0
Chromium	5
Cobalt	80
Copper	25
Lead	5
Mercury	0.2
Molybdenum	350
Nickel	20
Selenium	1
Silver	5
Thallium	7
Vanadium	24
Zinc	250

APPENDIX G
Administrative Record

Appendix G
Administrative Record List

Date	Author	Title
January 1985	Ecology and Environment, Inc.	Soil and Groundwater Investigation of the Southern Pacific Transportation Company Bayshore Railroad Yard
December 1985	California Department of Toxic Substances Control (DTSC)	Order to Post and Fence
September 1986	The Mark Group	Interim Report – Remedial Action Alternative Feasibility Study Field Investigations
January 1987	Ecology and Environment, Inc.	Recommendation for Further Action, Stauffer Chemical Company
May 1989	Hydrologic Consultants, Inc.	Remedial Investigation Data Study Report for Southern Pacific Transportation Company
December 1990	DTSC	Imminent and/or Substantial Endangerment Order and Remedial Action Order I/SE-89/90-004
July 1990	Levine Fricke	Draft Supplemental Remedial Investigation, Data Study Report
June 1991	Geomatrix Consultants	Underground Storage Tank Removal, 285 Industrial Way
June 1991	Geomatrix Consultants	Underground Storage Tank Removal, 350 Industrial Way
July 1991	Levine Fricke	Feasibility Study Report
October 1992	Treadwell & Rollo, Inc. (T&R)	Soil Quality Assessment, Industrial Way Properties
June 1993	T&R	Information Submittal, Industrial Way Properties
December 1993	Levine Fricke	Draft Remedial Action Plan
December 1993	DTSC	Final Remedial Action Plan
August 1995	DTSC	Fourth Amendment to Imminent and/or Substantial Endangerment Order and Remedial Action Order 1/SE-89/90-004
October 1996	DTSC	Remedial Action Certification
December 1997	Burns and McDonnell Waste Consultants	Additional Site Characterization Report
July 1998	Burns and McDonnell Waste Consultants	Remedial Action Objectives for the Former Bayshore Railyard Site
October 1998	Burns and McDonnell Waste Consultants	Groundwater Plume Stability Evaluation
October 1999	Burns and McDonnell Waste Consultants	Remedial Action Plan
May 2000	Burns and McDonnell Waste Consultants	Addendum to Remedial Action Plan
August 2001	Burns and McDonnell Waste Consultants	Investigation Report, Supplemental Bunker C Delineation
February 2002	Burns and McDonnell Waste Consultants	Revised Remedial Action Plan
2002	San Francisco Bay Regional Water Quality Control Board (RWQCB)	Conditional Approval of Revised Conceptual Remedial Action Plan for Southern Portion (Operable Unit 2) of the Former Bayshore Railyard Site
May 2002	Burns and McDonnell Waste Consultants	Investigation Report, Chlorinated Solvents, South Area
September 2002	Burns and McDonnell, Treadwell and Rollo	Remedial Investigation Report Joint Groundwater Operable Unit.
May 2004	Burns and McDonnell Waste Consultants	Brisbane Baylands Wetland Mitigation Plan

Date	Author	Title
2005	Burns and McDonnell Waste Consultants	Interim Remedial Measure Workplan
February 2006	Burns and McDonnell Waste Consultants	Groundwater Monitoring Report, December 2005 Sampling Event
March 2006	Weiss Associates, Inc.	Sunquest Industrial Way Property Destruction of Monitoring Well MW-1, 350 Industrial Way
February 2007	Burns and McDonnell Waste Consultants	OU-2 Additional Investigation in the area of HVOC plume
March 2008	Weiss Associates, Inc.	Draft Site Characterization Report, Former UST Sites
April 2008	RWQCB	No Further Action Required for Underground Storage Tanks at 250 and 350 Industrial Way
November 2011	Universal Paragon Corporation, Inc.	Email from Mr. Jason Lin of UPC to Mr. Krzysztof Jesionek of Geosyntec
December 2011	Universal Paragon Corporation, Inc.	Email from Mr. Howard Pearce of UPC to Mr. Krzysztof Jesionek of Geosyntec
July 2018	ESA	Brisbane Baylands, Draft Environmental Impact Report
August 2018	Burns and McDonnell Waste Consultants	Semi-annual Groundwater Monitoring Report, February 2018
November 2018	Geosyntec Consultants	Final Data Gap Investigation Work Plan
January 2019	Burns and McDonnell Waste Consultants	Semi-annual Groundwater Monitoring Report, August 2018
January 2019	RWQCB	Concurrence with the Technical Evaluation of Groundwater Quality Report
January 2020	Burns and McDonnell Waste Consultants	Semi-annual Groundwater Monitoring Report, August 2019.
February 2020	Geosyntec Consultants	Data Gap Investigation Report

APPENDIX H
Responsiveness Summary

December 17, 2021
Geotracker ID: T10000000103

Mr. Howard Pearce
Baylands Development, Inc.
150 Executive Park Boulevard, Suite 4000
San Francisco, CA 94134
hpearce@bdisf.com

CONCURRENCE WITH THE FEASIBILTY STUDY/REMEDIAL ACTION PLAN FOR BRISBANE BAYLANDS OPERABLE UNIT 2

Dear Mr. Pearce:

The San Francisco Bay Regional Water Quality Control Board (Water Board) staff has reviewed and concurs with the Draft Final Feasibility Study/Remedial Action Plan (FS/RAP) for the Brisbane Baylands Operable Unit 2 (OU-2), located in Brisbane, California (Site). The FS/RAP, dated September 19, 2019 and most recently revised on September 17, 2020, was prepared and submitted by Geosyntec Consultants, Inc. (Geosyntec) on behalf of Universal Paragon Corporation (UPC), now called Baylands Development, Inc. (BDI). The alternative selected in the FS/RAP includes the following elements:

- Capping of contaminated soil with a durable cover of a minimum of five feet of clean soil or installation of hardscape (e.g., roads, building foundations) to break the pathway between impacted soil and future site users across the entire Site;
- Excavating impacted soil where a durable cover cannot be placed and either consolidating the impacted, excavated soil in a new location at the Site under a protective cover or safely disposing of it off-Site;
- Excavating VOC-impacted soil and disposing of it off-Site;
- Treating groundwater and soil to break down VOC and petroleum-related contaminants;
- Testing soil vapor prior to building construction and installation of vapor mitigation systems where needed;
- Enacting enforceable land use restrictions and ongoing monitoring and maintenance of the protective covers, groundwater and any vapor mitigation system installed; and
- Maintaining financial assurance mechanisms to guarantee the ongoing monitoring and maintenance obligations.

The FS/RAP was circulated for public comment from October 28, 2020 to December 18, 2020 and the comment period was extended to January 31, 2021 at the request of

the community. A virtual public meeting was also held on November 18, 2020.

Enclosed is a copy of the Responsiveness Summary that addresses the comments received during the comment period. These documents should be added to the FS/RAP and an electronic copy of the FS/RAP in PDF format, marked final, needs to be provided to SFRWQCB within **seven days of the date of this letter**.

The FS/RAP also requires the development of engineering-level, parcel specific Remedial Design and Implementation Plans (RDIPs) to address the design details of the requirements, and plans, including but not limited to, those establishing soil import criteria and truck routes, health and safety measures to protect Site workers who will implement the remedy, and air quality monitoring during Site remediation. Water Board staff anticipates receiving drafts of the RDIPs for review starting in 2022.

If you have any questions, please feel free to contact Vic Pal at (510) 622-2403 or Vic.Pal@waterboards.ca.gov.

Sincerely,

Keith E. Roberson

Keith Roberson
Senior Engineering Geologist
Groundwater Protection Division

cc: Mr. Randy Brandt, Geosyntec, Inc., RBrandt@geosyntec.com
Mr. Krzysztof Jesionek, Geosyntec, Inc., KJesionek@geosyntec.com
Mr. Anthony Smith, Geosyntec, Inc., TSmith@geosyntec.com
Mr. Nicholas Targ, Holland & Knight, Nicholas.Targ@hklaw.com

CALIFORNIA
Water Boards
STATE WATER RESOURCES CONTROL BOARD
REGIONAL WATER QUALITY CONTROL BOARDS

RESPONSIVENESS SUMMARY

Draft Final Feasibility Study/Remedial Action Plan

Brisbane Baylands Operable Unit 2 (OU-2)
Bayshore Boulevard, South of Geneva Avenue
Brisbane, California 94005

December 2021

TABLE OF CONTENTS

1.0 INTRODUCTION 1
2.0 BACKGROUND 1
3.0 DRAFT FINAL FEASIBILITY STUDY/REMEDIAL ACTION PLAN 1
4.0 PUBLIC REVIEW PROCESS 2
5.0 COMMENTS AND RESPONSES 4

Attachments

1. Water Board Fact Sheet and Comment Period Extension Notice
2. Community Communications
3. Comment Letters

1.0 INTRODUCTION

This Responsiveness Summary has been prepared by the San Francisco Bay Regional Water Quality Control Board (Water Board) and responds to all public comments received during the 96-day public comment period on the Draft Final Feasibility Study/Remedial Action Plan (FS/RAP) for the Brisbane Baylands Operable Unit 2 (OU-2) project located along Bayshore Boulevard, south of Geneva Avenue in Bayshore, California (Site). This Responsiveness Summary will be incorporated as an appendix to the Final FS/RAP.

2.0 BACKGROUND

The approximately 140-acre Site occupies the southern portion of the former Southern Pacific Transportation Brisbane Railyard, which was used as a railroad switching yard from 1914 to 1982. Since 1982, the majority of the Site has been unused and vacant with various foundations and building slabs remaining, except for the properties along Industrial Way, which are occupied by commercial/industrial tenants. Tuntex, USA (now known as Baylands Development, Inc. (BDI), a subsidiary of Universal Paragon Corporation) purchased the Site in 1989 along with the northern portion of the Southern Pacific Transportation Brisbane Railyard, and the Brisbane Landfill to the east. The Water Board also provides oversight for the investigation and closure of the Brisbane Landfill while the California Department of Toxic Substances Control (DTSC) oversees the environmental investigation and remediation of the northern portion of the railyard (Attachment 1).

Since 1982, numerous environmental investigations have been conducted at the Site to characterize the presence, nature and extent of the pollutants. The most recent round of investigations was conducted in 2018 and 2019 and included the collection of over 1,100 soil and 150 groundwater samples at the Site. Pollutants of concern in soil include metals (primarily arsenic and lead), which are found across the Site. There is also an area with Bunker C oil in soil and groundwater and a localized area with elevated levels of volatile organic compounds (VOCs) in soil and groundwater.

3.0 DRAFT FINAL FEASIBILITY STUDY/REMEDIAL ACTION PLAN

In November 2018, the voters of the City of Brisbane approved Measure JJ, which amended the General Plan to rezone the Site and surrounding properties for mixed residential, commercial and public uses. Environmental remediation will need to occur at the Site to support redevelopment activities and provide long-term protection of public health and the environment consistent with the planned reuse of the Site.

The Draft Final FS/RAP describes the proposed remediation alternatives, evaluates these alternatives and proposes a preferred remedy that will be protective of the health of the future end users once each parcel has been developed, the health of the general public, and the environment. The remedy is also protective of the community and workers during implementation. The proposed remedy includes:

- Capping of contaminated soil with a durable cover of a minimum of five feet of clean soil or installation of hardscape (e.g., roads, building foundations) to break the pathway between impacted soil and future site users across the entire Site;
- Excavating impacted soil where a durable cover cannot be placed and either consolidating the impacted, excavated soil in a new location at the Site under a protective cover or safely disposing of it off-Site;
- Excavating VOC-impacted soil and disposing of it off-Site;
- Treating groundwater and soil to break down VOC and petroleum related contaminants;
- Testing soil vapor (gas) prior to building construction and installation of vapor mitigation systems where needed;
- Enacting enforceable land use restrictions and ongoing monitoring and maintenance of the protective covers, groundwater, and any vapor mitigation systems installed; and
- Supporting BDI's decision to maintain financial assurance mechanisms to guarantee the ongoing monitoring and maintenance obligations.

The FS/RAP also requires development of engineering-level Remedial Design Implementations Plans (RDIPs) to address the design details of the requirements, and plans, including but not limited to, those establishing soil import criteria and truck routes, health and safety measures to protect Site workers who will implement the remedy, and air quality monitoring during Site remediation.

4.0 PUBLIC REVIEW PROCESS

The Water Board conducted the following outreach as part of the public review process for the Draft Final FS/RAP.

Brisbane Baylands Community Advisory Group (BBCAG) Briefing: On August 18, 2020, the Water Board provided an update on the status of the Draft Final FS/RAP during a regularly scheduled BBCAG meeting. Water Board staff discussed the remediation alternatives being considered, noted that the document would be available for public comment later the same year and answered questions. This meeting also

provided BBCAG members with the opportunity to familiarize themselves with the virtual meeting format.

Public Comment Period: The Water Board held a public comment period from October 28, 2020, to December 18, 2020. At the request of the community, the public comment period was extended to January 31, 2021.

Draft Final FS/RAP Fact Sheet: On October 23, 2020, the Water Board distributed a fact sheet in English, Chinese and Spanish via U.S. Mail to 5,045 contacts including residences and businesses located within an approximately 0.5-mile radius of the Site; key representatives within San Mateo County, the City and County of San Francisco and the City of Brisbane; and local civic, community, and environmental organizations. On October 27, 2020, a copy of the fact sheet in English, Chinese and Spanish was delivered via email to 246 contacts who had previously signed up to be included on the project email list and those same contacts received a reminder of the upcoming close of the comment period on January 20, 2021. A copy of the fact sheet is provided in Attachment 1.

Public Comment Period Extension Notice: On November 25, 2020, the Water Board distributed a notice on the extension of the public comment period in English, Chinese and Spanish to 5,123 contacts including residences and businesses located within an approximately 0.5-mile radius of the Site; including residences and businesses located within an approximately 0.5-mile radius of the Site; key representatives within San Mateo County, the City and County of San Francisco and the City of Brisbane; and local civic, community, and environmental organizations. A copy of the extension notice is provided in Attachment 1.

Public Meeting: On November 18, 2020, the Water Board held a virtual public meeting to provide information on the Draft Final FS/RAP, answer questions and accept public comments. Community members were provided with directions on how to use the technology and simultaneous interpretation services were provided in Cantonese, Mandarin and Spanish. All questions were addressed during the public meeting and any formal comments are included in Section 5.0 of this Responsiveness Summary.

Community Communications: The Water Board placed a notice of the start of the public comment period in the October 23, 2020, City of Brisbane Manager's Weekly Blast e-newsletter and the November 2020 monthly STAR newsletter. On January 22, 2021, a reminder of the upcoming close of the public comment period was announced in the City of Brisbane Manager's Weekly Blast. The updates included links to where

community members could view the Water Board fact sheets in English, Chinese and Spanish.

The Brisbane Baylands Community Advisory Group (BBCAG) also reminded its members of the upcoming close of the comment period on January 25, 2021. Copies of these communications are provided in Attachment 2.

Information Repositories: Due to the COVID-19 pandemic, the local library repository is closed. However, the Draft Final FS/RAP and other Site-related documents were made available for public review at the following physical and online locations:

- Brisbane City Hall, 50 Park Place, Brisbane, CA 94005; Mondays and Thursdays, 9 a.m. to 1 p.m. until City Hall was closed to the public on December 21, 2020, due to an increase in COVID-19 transmission and a renewed regional stay at home order;
- An electronic repository at www.baylandsOU2.com; and
- The Water Board's GeoTracker database at: https://geotracker.waterboards.ca.gov/profile_report?global_id=T10000000103

The following documents were made available to the public during the 96-day public comment period:

1. Water Board Operable Unit 2 Draft Final FS/RAP Fact Sheet, October 2020;
2. Draft Final Feasibility Study/Remedial Action Plan, Brisbane Baylands Operable Unit 2, September 2020; and
3. Data Gap Investigation Report, Brisbane Baylands Operable Unit 2, February 2020.

5.0 COMMENTS AND RESPONSES

The public comment period ended on January 31, 2021. Fourteen (14) comments were received from the public. Three comments requested a change of address or thanked the Water Board for the information. The remaining 11 public comments and the Water Board responses are presented below. The Water Board would like to thank all individuals that took the time to comment, and we look forward to working with the community as the project moves forward.

1. **Commenter: Steve Rodrigues, Brisbane Resident**

   Comment 1.1 I support the FS/RAP but have concerns with UPC's RDIP. Will the surrounding communities be able to influence or negotiate things like truck routes and times of work/construction?

Response: The property is located entirely within the city limits of Brisbane and the City of Brisbane will approve the final truck route. This route will minimize truck trips through local residential neighborhoods and trucks will primarily travel along Bayshore Boulevard to US 101.

Work hours are also established by the City of Brisbane Municipal Code as 7 a.m. to 7 p.m. on weekdays and 9 a.m. to 7 p.m. on weekends and holidays.

2. Commenter: ZhiHui Lin, Community Member

Comment 2.1 Thank you for publicly consulting the public on the Brisbane Baylands OU-2 Cleanup Plan, which is very helpful to our residents in nearby communities. For those of us who live in this contaminated area, we and our children will live here for generations, so we hope to completely solve this pollution source. I hope that all the contaminated land can be dug out and transported to a suitable place or institution for safe disposal, instead of covering it with thicker soil, because rainwater, animals and plants will still spread the pollution source. I hope that if there is any further news in the future, you can email me.

Response: The Water Board has confirmed that you are on the project email list and will continue to receive email updates as the project moves forward.

Since 2009, the United States Environmental Protection Agency (USEPA) has encouraged the use of greener cleanup practices to reduce the environmental footprint of cleanup operations through best management practices (BMPs) and remediation technologies that reduce greenhouse gas and other air emissions, energy use, materials use, risk of accidents, etc. Taking this into consideration, BDI recommended the proposed alternative of establishing a durable cover with some limited excavation and off-Site disposal (approx. 10,000 cubic yards), groundwater treatment, vapor mitigation, and institutional controls. These remedial approaches will be protective of environmental health and, at the same time reduce greenhouse gas and air pollution emissions, limit material being placed in landfills in other communities, and reduce the risk of accident and community impacts caused by truck traffic. The Water Board concurred with BDI's findings that this was the most appropriate alternative for the Site, given that it met all criteria established under state and federal law while also being more sustainable than other alternatives considered.

3. Commenter: Anja Miller, Brisbane Resident

Comment 3.1 Initial comment: Your fact sheet contains conflicting statements about the OU-2 site. The last paragraph on p. 1 falsely claims that the entire 140-acre site is vacant, but the third paragraph on p. 2 defines Zone 6 as "properties along Industrial Way," which are known to be numerous actively working businesses. This kind of inattention to facts hardly lends public confidence in your future activities.

Response: We apologize for this error in the fact sheet. The Water Board is aware of the businesses on Industrial Way, and the omission was an oversight. In future communications, we will be sure to note that the entire 140-acre site is vacant except for the working industrial and commercial properties along Industrial Way.

4. **Commenter: Kathleen Jaramillo, Brisbane Resident**

   Comment 4.1 No comments but thank you for the info. Please change my last name from Gonzales to Jaramillo.

   Response: We have updated our mailing list accordingly.

5. **Commenter: Robert Mays, Brisbane Resident**

   Comment 5.1 How much longer till the project starts to break ground? I would like to know so if there are some home sales, that I am retiring soon. I would like to purchase home on the land project. Depending on the time, maybe senior living options.

   Response: The Water Board oversees the investigation and remediation efforts related to historical pollutants at the Site and is not directly involved with future Site redevelopment plans. It is anticipated that remediation and building construction will occur from 2023-2026.

6. **Commenter: William Wicklow, San Mateo Resident**

   Comment 6.1 What effect does this have on residential property tax rates – if any?

   Response: BDI, as the Responsible Party, will cover all costs related to the environmental cleanup of the Site. As such, we do not anticipate that the cleanup will have an effect on residential property tax rates.

7. **Commenter: Tom Coursey**

   Comment 7.1 Asked to be added to the mailing list.

   Response: Your name has been added to project contact list.

8. **Commenter: John Noll**

   Comment 8.1 Thank you for the information. Asked to be added to the mailing list.

   Response: Your name has been added to project contact list.

9. **Commenter: Mary Anne McGuire Hickey, Brisbane Resident**

   Comment 9.1 Please do not send two (2) packets of information. I received today 2 envelopes - addressed #1 as Mary Anny McGuire Hickey, Interested Community Member and #2 as McGuire Hickey, Mare Anne Trust. Wasted money.

Response: We have updated our mailing lists and deleted the duplicate entry.

10. Commenter: Prem Lall, Brisbane Resident

Comment 10.1 With regards to the Operation & Maintenance Plan for the OU-2 site, I asked whether in the case of the developer declaring bankruptcy and becoming incapable of financial responsibility for the plan, the City of Brisbane and its taxpayers would become financially responsible.

Response: A company declaring bankruptcy or otherwise becoming incapable of financial responsibility does not cause the City in which the company's land is located to become responsible for Operation and Maintenance obligations. Only those responsible for the Site's cleanup and maintenance are responsible for Operations and Maintenance obligations, including owners, operators, and those legally responsible for the pollution.

In response to the concerns expressed by the community and the City of Brisbane, BDI has agreed that a financing mechanism will be maintained for OU-2. It is noted that private owners of land would either maintain their own Operation and Maintenance for, e.g., vapor mitigation systems under their own building, or be covered by an owners' association. While the Water Board does not require financial assurance for this Site, the agency strongly concurs with BDI's decision.

It is anticipated that BDI will initially fulfill its commitment either directly through a bond, by payment into a site-wide owners' association, or through the formation of a community facilities district or similar responsible entity that has authority to undertake Operation and Maintenance of the Site. Due to the ongoing nature of the Operations and Maintenance obligations, it is anticipated that such an organization (e.g., community facility district with taxing capacity or owners' association with authority to assess fees and issue bonds) would be established to ensure that the Operation and Maintenance Plan is fully implemented.

Comment 10.2 Nicholas Targ of Holland & Knight (Outside Environmental Counsel re: the Baylands) mentioned that the developer would be responsible for the Operations & Maintenance plan for the OU-2 site for a period of 30 years (starting point of 30-year period not stated) and that a bond would be funded to ensure that in case of financial incapacity on the part of the developer, the Operations & Maintenance Plan would continue to be funded for the 30-year period.

Response: The Water Board does not require financial assurance for this type of Site. However, the agency strongly supports BDI's decision to establish a financing mechanism to fund the Operation and Maintenance Plan into the future.

The preferred remedy includes capping pollutants in place as well as some excavation and disposal of impacted soil and treatment. The Water Board requires long-term operation and maintenance plans to ensure this remedy remains effective. Operation and maintenance of the clean soil and hardscape durable covers will continue into perpetuity or until such time that additional remediation work is

conducted that makes it so operation and maintenance is not needed as determined by the Water Board.

The 30-year financial assurance mechanism is a feature of the Health & Safety Code, administered by the California Department of Toxic Substances Control, and applies in most cases. See California Code of Regulations, Title 22, Section 66265.143. Under that law, a financial assurance mechanism can include a bond, insurance, letter of credit, trust, corporate guarantee, financial strength of the company or alternate mechanism found to be at least equivalent to the financial mechanisms. Please see response to **Comment 10.1** for anticipated financing mechanism.

The financial assurance mechanism established by BDI will have the financing capacity to cover costs associated with a minimum 30-year operation and maintenance. Every five years the financing mechanism will be reviewed and adjusted, as needed. **Comment 10.3:** I requested the details of the bond referenced by Mr. Targ be made readily available to anyone in Brisbane who wished to see them and that a timetable be provided by which the details would be made available in the near future.

Response: Most details of the financial assurance mechanism will be included in the project's Operations and Maintenance Agreement or similar agreement, which will be available on the Water Board's GeoTracker database at https://geotracker.waterboards.ca.gov (search for "Brisbane Baylands"). Note: some financial information may be classified as confidential business information. However, information such as the nature of the financing mechanism, funding capacity, etc. and anticipated annual Operations and Maintenance cost will be included. Information pertaining to the financing mechanism will be posted before Site remediation (or any phase of the cleanup) is certified by the Water Board, and at the same time a land use covenant is executed. We anticipate that cleanup will begin in 2023 and finish in 2026. Therefore, it is reasonable to expect that financial assurance will be posted in 2027 or before.

You can view an Operations and Maintenance Agreement that was recently signed between BDI and the California Department of Toxic Substances Control (DTSC) for the Schlage Lock site to get a sense of how that site is addressing financial assurances. This information can be found at: https://www.envirostor.dtsc.ca.gov/public/deliverable_documents/6396672129/Signed%20O%26M%20Agreement%2012.3.2020.pdf.

Comment 10.4 I would also like to raise another issue that I did not raise during the meeting, and that is of the Midway Village residences in Daly City located approximately 1000 feet from the OU-2 site, near Schwerin Street at Midway Drive. You can see a map of the location of Midway Village at https://www.google.com/maps/place/Midway+Village/@37.7022149,-122.4148511,15z/data=!4m5!3m4!1s0x0:0x597fceff8a9960a1!8m2!3d37.7022664!4d

-122.4148278. Residences were built on this property which the developer declared to be safe, but there was so much toxicity in the soil beneath these residences that the people living there began to experience health problems including, "…lung and stomach cancer, asthma and bronchitis, anemia and blurred vision. Women suffered miscarriages, stillbirths, infertility and other reproductive maladies, while children endured skin rashes and frequent nosebleeds." (See the full article published in 2006, and there are several other articles about them.) I do not want to see what happened at Midway Village to happen to the future residents at the OU-2 site. The developer claims that there will be a cleanup of the toxins there, but the developer of Midway Village made similar claims which turned out to be false and/or misleading. Please read the SF Weekly article mentioned above carefully: "In its review, meanwhile, the EPA's Environmental Justice Advisory Committee offers a harsher critique of the cleanup. The panel faults the DTSC for disputing the need for more soil and groundwater testing of petroleum hydrocarbons, including benzene, a carcinogen linked to leukemia and anemia in humans. Based on the agency's sampling results, the report states, the degree to which such compounds contaminate Midway remains uncertain 'and no remediation [has been] done that would prevent ongoing exposure.'"

Response: The Water Board is committed to ensuring the long-term health and safety of the public and the environment and we have conducted our review of the Draft Final FS/RAP for this Site with that in mind. The proposed remedy, which includes a minimum of five-feet clean soil or hardscape cap, will protect the health of future users of the development because it blocks a potential exposure pathway to the impacted soil underneath. Also, the potential for volatile chemicals to migrate from soil and groundwater into buildings will be evaluated prior to construction, and, as appropriate to protect site occupants, vapor intrusion will be mitigated.

11. Commenter: Tony Verreos, Brisbane Business Owner

Comment 11.1 I've gone over the docs presented for the FS/RAP, and it seems that both DTSC and SFRWQCB have everything identified, figured out and under control. Something, experience tells me that some of my neighbors will not agree, and seek to poke holes in the reports, but I'm sure you're prepared for that. The one thing that stands out when I look at the Water Board fact sheet is that the 'blue' shaded Brisbane Landfill area appears to stop at Lagoon Rd. (which name I am not sure of what is the correct designator for it – it could be part of Tunnel?). My point being the Lagoon itself is reported to be at least partially connected to the Brisbane Landfill site. I don't know to what extent, as in the northern road and shoreline area, or if it is supposed to be landfill under the whole lagoon? The water is reputed to be polluted, yet, we don't know why, or what from, nor who's responsible for cleaning it up, as since it is not slated for hard development, it seems to be just an after-thought. Yet I hear there are multiple owners of under-water lots, and the area is posted no trespassing, and no recreational activities are allowed, however, fishing

occurs almost daily, and it should be assumed those fish are being eaten. Your thoughts on the lagoon situation please.

Response: The Water Board has required BDI to assess: 1) the presence of waste within the Guadalupe (Brisbane) Lagoon; 2) the quality of leachate seeps discharging to the Guadalupe Lagoon from the landfill; and 3) the quality of Guadalupe Lagoon surface water.

In the early 2000s, the Water Board requested that BDI's predecessor collect bottom sediment samples from the Guadalupe Lagoon for analytical testing. The sample collection and analytical test results indicated that the sediments did not contain waste and that pore water (i.e., water between soil particles) was not impacted by the landfill.

To ensure conditions do not change, also in 2002, the Water Board required that leachate seeps and two surface water samples from the Guadalupe Lagoon be included in the semiannual monitoring program. The Water Board has also required continued surface-water quality monitoring for the Guadalupe Lagoon to assure that "current conditions do not decline." Surface water quality monitoring has occurred over the last approximately 15 years and the analytical data collected generally indicate that this goal has been met.

This ALTA/ACSM Land Title Survey (https://www.dropbox.com/s/mfcjt2qpix2jpoh/89.12.29_22073-14ALTA-S10%20%28002%29.pdf?dl=0) shows that the Guadalupe Lagoon is owned by the California State Lands Commission.

12. Commenter: Graham Douglas, Brisbane Resident

Comment 12.1 The FS/RAP proposed cleanup alternative doesn't actually cleanup the site, but instead moves some soil and then covers the site up. How can a proposed cleanup that leaves toxic materials as a time bomb for future generations be deemed "cleaned -up" when it is just being hidden?

Response: Covering impacted soils with clean soil fill or hardscape, which is known as capping, is commonly used throughout the Bay Area at sites where residual contamination is relatively immobile. Capping is a very effective method because it breaks the potential exposure pathway between the impacted soil and people, thereby minimizing health risk. The use of caps also reduces material put in landfills, greatly minimizes truck traffic and safety concerns associated with hauling soil off-site, and reduces air pollution in the community and greenhouse gas (GHG) emissions more generally. The remedy also includes other activities such as localized soil excavation and off-Site disposal, in-situ degradation of VOCs in the groundwater, and removal of mobile components of the bunker C fuel oil to address residual pollutants that are more mobile. The combination of treatment, excavation, and capping effectively addresses all types of pollutants at the Site.

When deciding on the proposed remedy for a site, BDI and the Water Board evaluate alternatives using a set of criteria established under state and federal law. For this Site, the Water Board and BDI reviewed a wide range of remediation scenarios, including full removal of pollutants, and the proposed remedy was determined to best achieve the goals of the criteria to be considered, and required criteria, including the threshold criterion, long-term protection of human health and the environment. The Water Board reviewed this analysis and selected the recommendation.

While pollutants will be left in the soil under these protective caps, the proposed alternative includes ongoing monitoring and maintenance of the caps to ensure that the Site remains protective for future users. The Water Board also has the authority to require that the developer conduct additional investigation and remediation work whenever necessary to ensure the long-term protection of human health and the environment.

13. Commenter: Celina Tan, San Francisco Resident

Comment 13.1 How much impact would the dusts that are generated during the OU-2 site cleanup and the contaminants in the dusts (including those focused contaminants in the soil) have on the residences in the neighborhood? How large is the impacted area? What preventative approaches and solutions does the Water Board have for such an impact? Since OU-2 is very close to the residences, please come up with a plan of specific approaches to safeguard the health and safety of the residents in the neighborhood during the construction and environmental remedy on the site as well as removal of the toxic substances.

Response: The Water Board takes community safety during remediation very seriously. The Water Board considered issues of dust (including dust containing chemicals found at the Site) and how it could impact residents and others. The analysis was presented in the Human Health Risk Assessment and summarized in the Draft Final FS/RAP. The Draft Final FS/RAP also identifies that engineering controls to limit dust during emissions during construction will be set forth in the RDIP(s) and O&M Plans. More specifically, the Draft Final FS/RAP stipulates that:

> All earthwork at the Site will be conducted in accordance with a Dust Control Plan, which will be provided in the RDIP. The Dust Control Plan will define the methods to be used for dust monitoring and procedures for minimizing dust emission. Perimeter air monitoring will be conducted to verify the effectiveness of dust control measures. The generation of airborne dust will be controlled by one or more of the following methods:
>
> - Dampening active earthwork areas with clean water;
> - Installing rumble strips or similar to prevent soils from being tracked out of the Site and onto public roads;

- Decontaminating haul trucks and equipment prior to their leaving the Site;
- Covering/stabilizing soil stockpiles; Restricting the height from which soil can be dropped from an excavator bucket into a haul truck; and
- Stopping work if wind speeds exceed a pre-determined threshold.

Before adopting the RDIP the document will be available for public review.

14. Commenter: Karen Cunningham, Brisbane Mayor

Comment 14.1 First and foremost, the City wants to make sure that UPC implements a remedy that is (1) protective of human health and the environment and (2) consistent with Measure JJ. In doing so, the cost of remediation should not be the driver in the remedy selection process. a. Given that the preferred remedy results in most of the contamination being left in place, the City would like to see some mass removal of the most contaminated soil. Therefore, it is the City's preference that material containing chemical concentrations in excess of State of California Total Threshold Limit Concentrations ("TTLC") in the upper two feet of existing soil be excavated and disposed of at an off-site facility in accordance with applicable laws and regulations, rather than simply being left in place and capped.

Response: The Water Board's mission is to preserve, enhance and restore the quality of California's water resources and drinking water for the protection of the environment, public health, and all beneficial uses. To that end, the Water Board reviewed a wide range of remediation scenarios before concurring that the preferred remedy was both protective of human health and the environment and consistent with Measure JJ.

The Water Board is required to follow a set of criteria established under state and federal law when reviewing remedial options that include: (i) overall protection of human health and the environment; (ii) compliance with state and federal requirements; (iii) long-term effectiveness and performance; (iv) reduction of toxicity, mobility and volume through treatment; (v) short-term effectiveness; (vi) implementability; (vii) cost; (viii) regulatory agency acceptance; and (ix) community acceptance. Remedial options are not selected based on a single criterion, such as cost alone, but a combination of all nine alternatives with overall protection of human health and the environment and compliance with state and federal requirements as being threshold criteria that are required to be met in the final option.

The Water Board also appreciates the City sharing its preference for excavating and disposing the upper two feet of existing soil containing chemical concentrations in excess of Total Threshold Limit Concentrations (TTLC). After reviewing this suggestion alongside the proposed remedy, the Water Board has determined that the combination of capping, limited soil excavation and treatment as described in the

original preferred remedy protects public health over the long-term by breaking the exposure pathway to pollutants in the existing soil. TTLC is a threshold concentration that is used along with other criteria to regulate the proper disposal of polluted soil in a landfill. It is not a criterion that is used to evaluate potential threats to public health at a development site, such as OU-2. Therefore, the TTLC criterion appropriately applies to soil transported from OU-2 to an offsite landfill. It is also noted that because the TTLC criterion is not based on human health, the health-based cleanup levels in the Draft Final FS/RAP are lower than corresponding TTLCs. Excavating shallow soil based on TTLC exceedance would leave behind residual concentrations in shallow soil that exceed cleanup levels and would not appreciably reduce risk. However, soil excavation and off-site disposal of soil containing chemical concentrations in excess of the TTLCs would have significant downsides such as increasing the length of the project, increasing the number of truck trips involved, thereby increasing short-term air pollution and greenhouse gas (GHG) emissions, increasing traffic, likelihood of accidents, noise, and overall safety impacts.

Comment 14.2 Conceptually, with proper financing and implementation, the proposed remedy in the UPC OU-2 FS/RAP should be protective of current and future City residents and workers (both onsite and offsite) and the environment. Nevertheless, information regarding current soil vapor conditions and the extent of chlorinated volatile organic compound ("CVOC") impacted areas are not available and specific details about how the remedy will be implemented are not presented in the FS/RAP. To address potential concerns regarding the protectiveness of the remedial actions to be implemented and their compliance with the City's requirements and standards, including Measure JJ, the City requests to remain engaged with UPC and the San Francisco Bay Regional Water Quality Control Board ("Water Board") during the Implementation phase of the environmental remediation process. More specifically, the City would like to be provided the opportunity to review and comment on the future Remedial Design Implementation Plan and other UPC submittals to the Water Board regarding topics such as: a. Cap and utility corridor design; b. Soil vapor sampling; c. Soil survey/assessment of the Industrial Way area; d. Evaluation and treatment of CVOC impacts to soil and groundwater in the CVOC-impacted area; e. Soil management plan; f. Vapor intrusion assessments; g. Vapor intrusion mitigation system design; h. Indoor air sampling; i. Construction mitigation measures (e.g., dust control plan, stormwater pollution prevention plans, etc.); j. Air monitoring; k. Soil excavation, grading and management; l. Import fill standards; m. Haul routes and transportation routes; n. Long-term maintenance plans including associated financial assurances; o. Final sea rise analysis (to confirm the potential impacts due to rising groundwater levels are addressed in addition to potential inundation threats; and p. Land use restrictions.

Response: The Water Board recognizes the City takes an active role in the protection of the health of its citizens. As with the Draft Final FS/RAP, the Water Board will continue to work with the City's technical consultant, EKI, to make sure they have the opportunity to review and comment on the appropriate plan(s) that

address the specifics raised in your comments prior to the Water Board's concurrence with these plan(s).

15. Commenter: Brisbane Baylands Community Advisory Group (BBCAG) via Clara Johnson, Chair

Comment 15.1: The BBCAG thinks it is important that the synergistic and additive impacts of the chemicals of potential concern and the metals of concern present on the site be determined and be considered in assessing the harm it will cause to human health and to the environment. If that information is not available, then the evaluation of potential harm should be included as soon as it becomes available.

Response: California Health and Safety Code (HSC) Section 25356.1.5 requires risk assessments to consider the "possible synergistic effects resulting from exposure to, or interaction with, two or more hazardous substances." The Health Risk Assessment (HRA) included in the Draft Final FS/RAP does consider cumulative impacts of the pollutants found on-Site. The HRA determined that the Site in its current condition is safe for on-Site users and the nearby community; however, remediation will be necessary to provide adequate protection of future public exposure to the cumulative effects of the pollutants found at the Site.

The proposed remedy completely breaks exposure pathways to impacted soil and groundwater at the Site and mitigates exposure to vapors as appropriate to protect human health and the environment. Therefore, the chemicals at the Site pose no potential synergistic and/or cumulative harm to human health and the environment.

Five Year Reviews will be required for this Site and the exposure assumptions, toxicity data and Remedial Action Objectives used at the time of the remedy selection will be re-evaluated for validity.

Comment 15.2: The European Union list of Chemicals of Concern that was adopted by California. If it lists chemicals that are present on OU-2 but which were not investigated and evaluated then those chemicals should be added to the DRAP, evaluated and remediated.

Response: California has a list of chemicals considered as pollutants as defined in Health and Safety Code Section 25316 as modified by Section 25321. The Water Board has been overseeing the project team's work to compare and test for those chemicals that are considered pollutants in this state

Comment 15.3: You have chosen Alternative 3 as the proposed action plan. It contains a provision to place Volatile Organic Compounds and Petroleum Hydrocarbons and metals of concern under hardscape (concrete or asphalt). Hardscape is porous and will, over time, allow vapors from these chemicals to escape into the air. The amount of these volatile chemicals could be so densely packed under one area of hardscape or simply be, under so much hardscape,

multiple acres of it that it would create a pathway to inhalation by the people who visit, work there or who live nearby. A second concern about the placement of the volatile chemicals is the margin of error that is used to make sure the chemicals are not too close to the edge of the hardscape. There should be a specific distance from the edge of the chemical placement and the edge of the hardscape that cannot be decreased no matter what the conditions are. If there is no hardscape between the VOCs and the soil cap, then once again there will be a pathway to human inhalation. A third concern is the possibility that the hardscape will be disturbed by workers for road repair, landscaping, utility installation or repair or intrusion of surface water. One of these events happens fairly frequently. The contamination is found all over the site and there may be a substantial amount of chemicals to be sequestered under the hardscape. Are you going to clearly mark the many areas that should not be disturbed clearly enough so that all the people involved in the numerous types of activity mentioned will be aware. You need to rethink this plan because there isn't sufficient protection of human health and the environment.

Response: As detailed in the Draft Final FS/RAP, the proposed remedy will include removing soil impacted with VOCs and other constituents as necessary to ensure the long-term protection of human health and the environment. Groundwater impacted by VOCs north of Industrial Way will be treated in place with biological and/or chemical technologies to promote the breakdown of those chemicals in groundwater, so concentrations will be significantly reduced from current levels before capping. The Bunker C Oil area may also be treated using a thermal/smoldering technology should additional evaluations determine that will be necessary for protecting human health and the environment. The approved cap can consist of hardscape, defined as any hard surface such as concrete building foundations, asphalt roads, concrete sidewalks, etc., and soft scape, defined as the minimum five-foot thick layer of clean soil. The cap will be an effective physical barrier for the remaining pollutants as it will prevent contact with the pollutants and thus break the potential exposure pathways.

While some VOCs may move through the cracks in soil and hardscape, such as asphalt roads, when they escape into the outdoor air they dissipate and no longer prevent a potential health exposure risk for future Site users. As part of the remedy, BDI will be required to conduct soil vapor testing after mass grading activities are complete and prior to the construction of any buildings. Should results show the potential for VOCs to migrate (intrude) into the future indoor air of buildings, the Water Board will require the construction of a vapor intrusion mitigation system as part of building construction. This system will likely include a sub-slab vapor barrier and venting system. The Water Board will also require institutional controls including land use restrictions and ongoing monitoring and maintenance of any clean soil or hardscape caps and any installed vapor intrusion mitigation systems to ensure that they continue to be protective of public health and the environment into perpetuity.

Areas with pollutants will be capped with either hardscape or a minimum of five feet of clean fill, and in some areas, both hardscape and soil, so that there will be no

areas of the Site with pollutants that are not covered by a cap when remediation work is completed. An engineered cap must take into account the various pollutants of concern and the routes of exposure associated with those chemicals. If there are volatile chemicals underneath the cap, its design would address those concerns. If a cap (either hardscape or clean soil) cannot be installed, then soil impacts above Site-specific cleanup goals will be excavated, removed, and disposed of at a licensed off-Site facility. The resulting excavation will be backfilled with clean imported soil.

As part of the remedy, the Water Board requires the preparation of a Soil Management Plan (SMP) that will describe how to safely handle and dispose of any potential impacts encountered during future construction work such as road repair, utility installation, etc. Any contractors working with soil from below the cap will be required to follow the safety measures included in that plan. The minimum five-foot thick, clean soil cover in other areas of the Site will allow for future activities such as landscaping work to occur in clean soil without the need for any special handling. The line between clean soil and impacted soil will be clearly marked with a demarcation fabric to ensure that work does not occur in impacted areas without workers following the Soil Management Plan. The Water Board also monitors sites with Soil Management Plans using Terradex's LandWatch service. LandWatch monitors excavation via a national network of Call-Before-You-Dig systems, building/drilling permits and other items and sends an email alert to the Water Board when work is planned in an area subject to the Soil Management Plan.

Comment 15.4: Soil Vapor Monitoring Systems should be placed in all buildings, residential, commercial and public. Soil Vapor barriers should be placed below all buildings. The systems should be monitored once a quarter to make sure they are functioning. Soil Vapor barriers could be disturbed by earthquakes, liquefaction, grading, pressure from salt water intrusion or groundwater pathway shifting due to any of the above causes.

Response: As part of the remedy, the Water Board will require BDI to conduct soil vapor testing at the location of future buildings prior to the construction of any buildings. Should results show the potential for VOCs to migrate (intrude) into the future indoor air of buildings at unacceptable levels, then the Water Board will require the construction of a vapor intrusion mitigation system as part of building construction. These systems will be specifically designed to the proposed building configuration, but generally will include a sub-slab vapor barrier and vent piping (see response to **Comment 15.3**). Should results show that a mitigation system is needed under all future buildings, the Water Board will require that construction. As part of the Operations and Maintenance Plan required under the proposed remedy, BDI and its consultants will be required to perform ongoing monitoring and maintenance of the soil vapor mitigation systems to ensure they are properly operating and effectively preventing VOCs from entering into the building. Should the monitoring show any issues in the performance of these systems, the Water Board will require immediate action to address the situation and ensure the long-term protection of

public health. As part of these monitoring efforts, the Water Board will require BDI and its consultants to monitor the caps as soon as it is safe to do so after a major natural disaster, such as an earthquake, and make any necessary repairs so as to ensure Site users' safety.

Comment 15.5: The soil cap should be more than five feet deep at its thinnest. It should be at least ten feet deep in order to provide a margin of error. The public should be notified within a week if the soil cap has had its integrity compromised or if any other safety system has been compromised. The public should be told within a week what has happened, what the risks are and when the integrity of the safety system is restored. There should be an agreed upon method of notification. The operational monitoring systems semi-annual reports should be easily available. And any changed conditions should be transmitted to the public including anyone who regularly visits, lives or works on OU-2.

Response: A five-feet thick soil cap provides a high factor of safety. As documented in DTSC's Proven Technologies and Remedies Guidance for Remediation of Metals in Soil (https://dtsc.ca.gov/wp-content/uploads/sites/31/2016/01/Guidance_Remediation-Soils.pdf), two feet of clean soil is commonly considered protective of human health and the environment. In many areas of the Site, the clean soil cap will actually be greater than five feet to support the final design elevation of the future redevelopment. The Water Board has determined that this thickness is acceptable to prevent possible exposure from the pollutants underneath as it is unlikely that a resident or average community member would dig deeper than five feet into the soil. In addition, clean utility corridors will be constructed to protect future construction workers, and the contact between the clean utility corridor backfill and impacted native soil will be marked with a bright-colored demarcation geotextile fabric.

As part of the remedy, BDI will be required to: (i) annually inspect the integrity of the cap and report the results of the inspection to the Water Board for review, and (ii) report any construction work that excavates deeper than the minimum five-feet of clean soil. Those construction workers will be required to follow a Water Board-approved Soil Management Plan that describes how to safely handle and dispose of any pollutants encountered. The Water Board will provide oversight for these activities to ensure pollutants are handled and disposed of properly.

The Water Board keeps an updated and publicly available record of Site activities on its GeoTracker website (https://geotracker.waterboards.ca.gov/profile_report?global_id=T10000000103). Should the caps be disturbed as part of any construction work, information on the work and how the soil was properly handled will be available on this website linked to above. The monitoring reports will also be available on this website. Community members are welcome to visit this website at any time for updates and can also sign up for email alerts every time something is posted to GeoTracker.

Comment 15.6: Why isn't the FS/DRAP specifically consistent with the EPA rather than generally consistent with U.S. EPA Guidelines for Conducting Remedial Investigations as it states on Pg. 1?

Response: The Draft Final FS/RAP is consistent with U.S. EPA guidelines, including the National Contingency Plan (NCP). The expression "generally consistent" provides for allowances and minor deviations as a result of Site-specific conditions and state requirements.

Comment 15.7: On page 34 of volume 2 of the DRAP, it states that the incremental non cancer risk and excess cancer risk is two times higher from arsenic in the soil over background. To what level of risk and by what means will you reduce that risk using Alternative 3. Shouldn't it be reduced to near background?

Response: The proposed remedy will break the exposure pathway to impacted soil and groundwater at the Site. In other words, when the cap is in place, the public will have no exposure to the arsenic in the underlying soil. By importing clean soil with arsenic concentrations equal to or less than background, the exposure risk will be reduced to ordinarily expected conditions in the Bay Area following construction of the soil cap (see also the response to **Comment 15.16**).

Comment 15.8: The RDIP should be presented to the public when it is in draft form. It provides a more specific description of exactly what will be done to carry out the Remedial Action Plan. The public should have a chance to ask questions and offer comments. A public meeting must be held to explain to the public.

Response: The Water Board will hold a public meeting to discuss the contents of the RDIP with the public as part of the approval process of that document. While a formal public comment period is not required as part of the preparation of the RDIP, the Water Board will consider any comments raised during the public meeting on the RDIP and make any appropriate changes prior to issuing its final concurrence with the document.

Comment 15.9: The BBCAG restates our view that there should not be any residential uses on any part of the Baylands including OU-2.

Response: While we understand your preference is to not allow residential uses on any part of the Brisbane Baylands, Measure JJ allows for the construction of both residential and non-residential land uses. The Water Board has reviewed the Draft Final FS/RAP and determined that it will provide for the long-term protection of all future Site users, including ground floor residential uses. Remediation activities in residential areas will be conducted in a manner that provides long-term protection for future residents.

Comment 15.10: There is a statement on page 67 of the FS/DRAP that says, "..to ensure the protection of future users of the site by breaking the pathway to impacted soil". It is made within a section on soil capping. We look at the many toxic contaminants that are found in ou-2 and we conclude that whatever buildings that

are built here should be separated from the ground level by pillars (on the perimeter and within It) that would allow air to flow between the ground level and the floor of the structure. We think that this necessary to protect human health even with all the remedial actions that are called for in Alternative 3.

Response: The exposure pathway to impacted soil would be broken by either the five-foot thick, clean soil cover and/or the roadways, building foundations or other hardscape that will act as a cap. In other words, when the cap is in place, the public will have no exposure to the underlying impacted soil. Prior to constructing occupied buildings, a soil vapor survey will be required (see response to **comment 15.3**). Based on the results of the sampling, engineering measures – known as vapor intrusion mitigation measures – may be required to ensure the long-term protection of future building occupants. This could include vapor barriers being installed under the building foundation with associated vent piping to redirect vapor into the atmosphere above building rooflines. Some buildings could also be designed with open-air ground floors (such as an open-air parking garage with first floors of buildings support by pillars) or non-residential uses on the ground floor followed by residential uses on higher floors. The exact engineering measures will be dependent on the soil vapor sampling results and the specific building design to ensure these measures provide an adequate level of protection to future building occupants.

Comment 15.11: The information on truck trips to either import soil for the soil cap indicates that over 100,000 truck trips of 12 cubic yard capacity will be required for the construction of the soil cap. The soil that needs to exported for disposal requires another 1000 truck trips. All of these trips will have a significant impact on traffic in the area. It will also create a significant amount of greenhouse gas emissions. The rules and routes used must be carefully designed to lessen the disruption caused by this project on surrounding communities and U.S. 101. The trucks used for the soil hauling must be zero emissions vehicles. These activities are projected to take place three to six years into the future and the efforts to blunt the effects of Climate Change will be even more of a priority than they are today. There are other remedial activities that occur totally within the boundaries of the Baylands. These trips must be taken into account when calculating greenhouse gas emissions and noise and what must be done to mitigate impacts.

Response: Climate change including greenhouse gas emissions have been studied and the remedy is designed to reduce these impacts while still achieving the cleanup goals at the site. The use of protective caps in lieu of excavation and off-Site disposal greatly reduces the overall greenhouse gas emissions when compared with a full soil removal remedy. In addition, the total number of truck trips and other vehicle emissions as part of remedy construction will be taken into consideration as part of the development of the Remedial Design and Implementation Plan (RDIP). The Water Board will require that BDI follow any City of Brisbane requirements regarding the types of trucks used and the truck route that will be followed. The agency will also require that the trucks minimize travel in surrounding neighborhoods

to the greatest extent possible. While the Water Board does not have the authority to mandate that zero emissions vehicles be used for the project, the RDIP will include other best management practices to reduce greenhouse gas emissions, including limiting truck idling.

Comment 15.12: In section 2.2 of the Health Risk Assessment, it states that deep groundwater that meets standards for drinking water should be considered a potential source of drinking water. The BBCAG strongly opposes this decision. There is not guarantee that this deep groundwater will remain untainted there are many activities on the e.g., excavating, pile driving, and other disturbance caused by construction that could disturb the path of the groundwater. Another possibility is salt water intrusion from rising sea water.

Response: With some exceptions, all groundwater in the Bay Area is considered an existing or potential source of drinking water. However, this does not mean that deep groundwater will be used now or in the future as drinking water for the residents of Brisbane. Drinking water is currently provided by the San Francisco Public Utilities Commission (SFPUC), which sources much of its water from the Hetch Hetchy Reservoir. Occasionally, the water may be supplemented or come directly from East Bay or Peninsula reservoirs. The City of San Francisco and impacted water districts would require Water Board approval should they choose to provide drinking water from other sources in the future. The Health Risk Assessment considers deep groundwater that meets standards for drinking water as a potential source of drinking water to help derive the risk calculations that determine the health and safety of the public and the environment under current and proposed Site uses. Based on the analysis, the Water Board is including a deed restriction prohibiting the use of groundwater as part of the remedy.

Comment 15.13: In the last few hundred pages of this document, there are appendices that discuss detects and non-detect and sub-categories of non-detects of a number of COC's and MOC's in soil and in groundwater. There should be a key that explains the meaning of detect and non-detect and the varieties of both and the sub-categories because it is very difficult for the public to decipher these pages.

Response: The Water Board will require a key in future reports to help community members better understand investigation results.

Comment 15.14: A number of years ago, the BBCAG repeatedly requested that we be allowed to see the environmental investigations that are a part of the history of this site and are included in this document. We were told that RWQCB wasn't sure if it could make the documents public. It would have been helpful if we had been allowed to see these documents year ago. We request that in the future, environmental investigations be made available when they are reviewed and accepted by RWQCB.

Response: Environmental investigation reports and other key technical documents will be uploaded to the Water Board's GeoTracker website

(https://geotracker.waterboards.ca.gov/profile_report?global_id=T10000000103) after the Water Board provides its concurrence as requested. The results of the Data Gap Investigation for OU-2 are available on that website and were made available throughout the public comment period in support of the Draft Final FS/RAP. Water Board staff are available to help interested community members review the technical information in these reports.

Comment 15.15: In the Trench Model discussion evaluating risks from soil vapor rising from contaminated groundwater in a trench, why was the Virginia State Model used. Isn't there a California Model to use?

Response: There are no California models that conservatively assume that VOCs can accumulate in the breathing zone of unventilated trenches or excavations. The Virginia State Model was developed for widely used applications and use of the Virginia State Model is being implemented as an industry "best practice" by many states in evaluating these risks.

Comment 15.16: The RWQCB or Cal EPA should suggest to the California Legislature that new laws more protective of human health and the environment be put in place. Laws that are based on more recent research that is expansive rather than narrow in its scope of possible additive and synergistic effects from the combination of many toxic chemicals and metals. Perhaps, the loss of diversity of animal and plant species and the expectation that 1 in 2 men will get cancer in their lifetime and 1 in three women will get cancer result from the current regulatory approach. The laws we have now that allow from 1 to 100 extra cases of cancer to result from one project are helping drive those rates.

Response: The Water Board and CalEPA are always reviewing environmental standards and the latest science to suggest improvements to the laws that safeguard public and environmental health. A recent example is the State of California Office of Administrative Law in September 2018 approved the Toxicity Criteria Rule that protects human health by ensuring that human health risk assessments, risk-based screening levels, and risk-based remediation goals for hazardous waste and hazardous substance cleanup sites in California use appropriate toxicity criteria based on best available evidence.

Considering synergistic and additive effects, current methodologies for human health risk assessments treat mixtures as simple mixtures, based on the combined toxicity of individual components from single-chemical studies. The risk assessments conservatively assumed simultaneous evaluation of multiple chemicals from different media and multiple pathways of exposure when, in reality this is a conservative assumption. However, we note that the assessment of chemical mixtures is evolving and steps to improve our ability to evaluate human health impacts of chemical mixtures are ongoing.

Finally, the risk assessment follows the National Contingency Plan and related USEPA guidance where it states that the lifetime incremental cancer risk posed by

chemicals at a site should not exceed a range of one in one million (1×10-6) to one hundred in one million (1×10-4) and non-carcinogenic chemicals should not be present at levels expected to cause adverse health effects (i.e., a hazard quotient [HQ] greater than unity, 1). The 1×10-6 risk level is considered a de minimis risk and is significantly lower than the baseline cancer risk of 1 in 2 for men and 1 in 3 for women. The cleanup levels in the Draft Final FS/RAP are based on an excess cancer risk of 1 in 1 million (i.e., 1x10-6) or one additional incidence of cancer in a population of one million.

16. Commenter: Dana Dilworth, Brisbane resident

Comment 16.1: How can the preferred remedial action and standards be anything other than to remove the toxins and bring it up to drinking water standards, Alternative 4?

Response: The Water Board's decision-making process for the Draft Final FS/RAP is informed by nine weighted criteria, including overall protection of human health and the environment; compliance with state and federal requirements; long-term effectiveness and permanence; reduction of toxicity, mobility and volume through treatment; short-term effectiveness; implementation; cost; regulatory agency acceptance and community acceptance. The Draft Final FS/RAP prepared for this Site studied several remedial options and Alternative 3 – a combination of on-Site capping and treatment of pollutants with limited off-Site disposal – was chosen because it scored the highest rank based on the nine criteria and will allow for long-term protection of public health and the environment while reducing impacts to the community. It does so by either removing or treating areas with pollutants or by placing protective clean soil or hardscape caps that remove the potential exposure pathways for future Site users. It was found that Alternative 4, which includes removing pollutants from across the Site, would take many years and be extremely impactful to the community and environment in terms of air pollution, noise, traffic impacts and safety. Thus, the Water Board determined Alternative 3 offered the best balance of all nine criteria and was selected as the preferred remedial action.

Comment 16.2: I am concerned about misstatements that are circulated as fact. How is it possible that lands under an Imminent and Substantial Endangerment Order from a multitude of known and yet to be discovered toxins with multiple avenues of transmission is of no health risk in its current condition, nor pose any risk to aquatic life? The Baseline Health Risk assessment incorrectly chirps this same notion. I am concerned that this "all is well" "we're exempt" attitude, when repeated from the Water Board will produce lesser beneficial results.

On numerous occasions, when these lands were under DTSC's order, we had to evict homeless people, stop weekend vegetation "clearings" (bulldozing contaminated soil), stop parties and raves at the Roundhouse, stop bottle and treasure hunters, stop kids from creating bike moguls and RC race tracks, and control parking dust from Cow Palace events. How are the consultants for this

property unaware of its present dangers? They should be making recommendations for an immediate layer of clean soil, for greater caution signage to protect the unaware public rather than make false statements that there are not any health risks on OU-2 in its current condition.

Response: A Health Risk Assessment (HRA) was conducted using the data collected from the soil, soil vapor and groundwater beneath the Site, which found that the Site in its current condition does not present a significant risk to on-Site visitors, the community and the environment. This is because the pollutants are buried underground and there is not a direct exposure risk. The Water Board reviewed the findings in the HRA and concurred with its results. Rather than considering the Site "exempt" or "all is well," the Water Board is requiring remedial actions to ensure the long-term safety of the public and the environment under future redevelopment conditions. The HRA, however, accurately notes that in its current condition, there is not a significant health risk from the Site.

BDI regularly monitors the Site and maintains Site fencing and locked gates to help ensure there are no unwanted activities or trespassers at the Site that could potentially come into contact with the buried pollutants.

Comment 16.3: It is painful for me (due to disability) and upsetting to review these documents and ask, after 30 plus years (1988) of allowing the landowners to leak toxins into the bay, this is all we get? Maybe more wells, maybe not, maybe a pilot liquefaction program, maybe the toxins stay, maybe they go, maybe effective remedies, maybe not.

The document is insufficient as a legal guiding document as it doesn't have a sense of urgency to stop these toxins from leaking into the bay… Thirty years of leaking, enough is enough! If anything, you should IMMEDIATELY require a boon and detention basin at the "outflow area" where the highest VOCs are detected in the ground and surface water.

Response: The Water Board can meet with you to discuss these documents or provide them to you in a way that facilitates ease of review.

The Water Board is committed to ensuring the protection of public health and the water resources of California. Investigations and monitoring of Site conditions have been ongoing since 1982 to adequately characterize and understand Site conditions. The results from these investigations have found that toxins from the OU-2 Site are not actively leaking into the Bay because the majority of pollutants are bound in soil and fairly immobile. The proposed remedy will address Site pollution in a manner that safeguards the Bay and the surrounding environment and there will be continued monitoring of the protective caps and pollutants underneath them into the future so that, should conditions change, an appropriate response can be taken in a timely manner.

Comment 16.4: The Data Gap investigation of 11/27/18 is woefully inadequate. If your only contaminants of concern in a 100' by 100' investigation along Industrial Way are arsenic and lead, then you missed all the chromium, propylene glycol, epoxies and resins, spent brake fluid, and solvents the car and cabinet shops along Industrial Way have poured into the "ditches" and ground for years.

I have personally observed them draining radiators and dumping other cleaning fluids into the ground. In thirty years, to have not adequately studied this area is an outrage. Yes, the buildings have to come down first, but you have let the current workers work in an unsafe environment. You also have to test for the right chemicals, based on an exhaustive historical business search, the Data Gap is a little meager. What chemicals may be present around the Bayshore Sanitary District office?

Response: Over 1,120 samples were collected at OU-2 during the 2018 data gap investigation that looked at a wide range of chemicals based on known and potential pollutant sources. This included testing for solvents, chromium and other chemicals that might be found in the epoxies and resins you mention.

After a thorough review by both the City's environmental consultant, EKI, and the Water Board, the Water Board concluded that the combination of historical data and data collected from the 2018 data gap investigation was sufficient to show that the Site has been adequately and fully characterized so that health risks could be properly evaluated, and an appropriate remedy selected.

Data show that arsenic and lead are the primary pollutants of concern found across Site soils along with a localized chlorinated solvent area and a Bunker C oil area near Industrial Way. This means that these chemicals are present at concentrations that require remedial actions to ensure the long-term protection of public health and the environment under future Site uses. While other chemicals were found as part of the investigation, they are not present at levels that require remediation.

Comment 16.5: There are reasons for chrome VI near the Stauffer Chemical building, but somehow it isn't in a quantity to be a chemical of concern? The tanneries' acid and aniline dye pits were previously noted chemicals of concern. Have the MCLs changed? It would be good to isolate that area with targeted testing and remediation, just to be safe. Chrome VI doesn't work well in any species' developmental stages.

Response: Groundwater samples were analyzed for hexavalent chromium (chromium VI) and the highest concentration was observed near the western boundary of the railyard near the former Stauffer Chemical facility. However, this concentration was below the screening level for ecological receptors in the San Francisco Bay. The only potentially complete exposure pathway for chemicals in groundwater to human receptors is the vapor intrusion pathway. Although hexavalent chromium is not volatile and, therefore, does not pose a vapor intrusion risk, volatile chemicals that do pose a potential vapor intrusion risk will be addressed by vapor

intrusion mitigation, as described in the Draft Final FS/RAP (see response to **Comment 15.3**).

Comment 16.6: When the 250 and 350 Industrial Way buildings were razed, there were reports of the pH in soil being acidic and the soil being warm, indicating a chemical reaction underground. These test observations are not disclosed in the Data Gap Investigation Report. It would be beneficial to know pH and temperature if your caissons or VOC sheeting under your future buildings will disintegrate because of the pH in the soil below. pH is not a chemical of concern per se, but it should be tested.

Response: Thank you for your suggestion to test pH. As part of the investigations, soil conditions are noted and while we do not test directly for pH if there were indications that a chemical reaction would be occurring underground, then additional testing would be conducted, potentially including soil pH, if appropriate.

During the data gap investigations, there were no signs that would lead us to believe there is an active chemical reaction occurring underground near Industrial Way. The results of the data collected support these findings.

Comment 16.7: It is unclear whether you will go down the full 50 feet to Young Bay Mud and remove the entire Bunker-C pox (future sand boil), or whether you will smear parts of it around to non-detect or use the smolder-in-place technique for the entire wad. Please clarify.

I object to the burning of Bunker-C in place. Brisbane does not allow new toxic burners and has no designation for chemical production facilities. It's a slippery slope. Have you considered the air quality impacts of burning Bunker-C relative to rail or truck transportation off-site to a qualified site? Have you considered the safety considerations of burning fuel near Kinder Morgan Tank Farm? Do you require any setbacks for the waste by-product that gets repatriated into the morass? The by-product should be encased properly or shipped of site. We are not a hazardous waste dump.

What about the sensitive receptors up wind, on the Ridge? Will they be informed of the burning schedules? How many other urban communities have experienced this technique? What is their experience? What are the pros and cons of this proposed remediation? Would mycelium remediation be a gentler technique? There is insufficient information in this document for the public to make an informed decision. We need a full discussion of alternatives.

Response: Investigation results show that Bunker C oil is present in a portion of the Site to a maximum depth of approximately 15 feet below the ground surface. Prior to implementing the proposed remedy, testing will be conducted to confirm whether Bunker C oil could be effectively capped in place and remain immobilized in soil. Based on the results of this testing, the Water Board would determine whether

capping in place would be an effective remedy or if some form of treatment would be required.

The option to use a thermal/smoldering technology to treat Bunker C Oil would be studied in further detail should capping not be an effective method. Should this technology be found to effectively treat Bunker C Oil, engineering controls would be designed to ensure the safe operation of the treatment system given Site conditions including wind conditions and the nearby Kinder Morgan tank farm. Any thermal/ smoldering treatment would occur away from the tank farm and operate under the appropriate permits so as not to negatively impact air quality. The report would also review the pros and cons of this technique, address potential impacts and mitigation measures that might affect nearby sensitive receptors, etc. The Water Board would review all reports related to using thermal treatment to address Bunker C oil and would decide whether this treatment would be effective and be protective of the surrounding community while being implemented.

We would be happy to share this study with you, should we explore this treatment option, so that you can have a better, more detailed understanding of this process. The Water Board remains available to you, or anyone else in the community, who has questions about the safety around implementing any remediation technologies at the Site.

Comment 16.8: Do not create a matrix of small hazardous waste sites under future streets or buildings. Who wants that in their neighborhood? The toxins will still co-mingle with groundwater and other chemicals, both present and unknown, untested other dangers, like acids or radioactive substances.

Response: A majority of the toxins at this Site are bound to the soil and immobile which is why capping is an effective remediation technology for this Site. Capping of soil is commonly used and is a very effective method because it breaks the potential exposure pathway between impacted soil and people, thereby minimizing risk. Those toxins where the exposure pathway would not be effectively addressed by capping will either be removed and disposed of off-Site or treated. The Water Board is committed to ensuring the long-term protection of human health and the environment and will ensure that the Site is protective for all future users and land uses.

Comment 16.9: You mention the City's representative "EKI" being in the stakeholder meetings. Was the city's independent remediation consultant, Dr. G. Fred Lee also present? The Brisbane City Council promised his guidance and comments. We would greatly appreciate his input.

Response: No comments have been received from Dr. G. Fred Lee.

Comment 16.10: Sloppy job. No groundwater samples for 15 years? So much for continuity and detecting patterns and movement of chemicals of concern. There is also an interesting omission of the discussion of the VOCs near Kinder Morgan or their in-situ wetland remediation method for their past fuel spills at the southern end

of OU-2. There's a direct environmental impact, totally omitted. This omission makes this feasibility study insufficient.

Response: Ongoing investigation activities conducted at the Site since 1982 have adequately characterized the size and scope of the pollutants at the Site, including the groundwater impacts. The purpose of the Data Gap investigation was to allow for the development of the proposed Draft Final FS/RAP, which summarizes the findings of the investigation and lays out the proposed remedies for the Site. With this information, the RDIP can be prepared that will tell us the specific remedial technologies and engineering controls that will be used to address pollutants on a parcel-by-parcel basis. The Water Board has to review and concur with the findings of the RDIP before remediation will be allowed to proceed.

During remediation, should we find unexpected historical features, etc. the Water Board will require that BDI address them in an appropriate manner to ensure the long-term protection of future Site users and the environment.

Please note, the Kinder Morgan Site is not part of OU-2 and is being separately addressed under its own regulatory oversight. Those impacts will be addressed under that project's oversight and that project will remain open.

Comment 16.11: There is little mention of the South Disposal fill area and the earlier assumptions, RAO's and maximum contaminant levels have changed over time. It doesn't mention our inadequate chemical statues as compared to the EU's REACH or better standards. None of the earlier Superfund listing criteria studies considered housing as a viable use, hence "no target audience." A lot has changed, even how we view housing and work needs due to the pandemic.

Response: The South Disposal Area is listed as a major railyard facility in Section 2.2.1, and additional detail is provided in Appendix C to the Draft Final FS/RAP, "Data Gap Investigation Report".

The Water Board has reviewed this document in accordance with the latest approved standards (e.g., screening levels, health risk assumptions, etc.) the Water Board uses to ensure the protection of human health and the environment. In addition, the document went through five iterations and includes revisions made as a result of multiple meetings between Water Board staff, the City of Brisbane, the City's technical consultant, EKI, and revisions made in coordination with the California Department of Toxic Substances Control (DTSC) staff overseeing the sister UPC OU-SM site. As a result, the Water Board has determined that the proposed remedy will be protective of future Site users under the proposed land uses.

Comment 16.12: It's not clear what the threshold for removal is. MW-4A had detections of metals including arsenic, barium, chromium, copper, lead and zinc…. And "Antimony, arsenic, barium, cadmium, chromium, cobalt, copper, lead, molybdenum, nickel, selenium, and zinc were detected in at least one of the two groundwater monitoring wells at relatively low concentrations…" (FS/RAP pg. 18).

What level of cleanup will happen there? None because they are relatively low, or aggressive removal because of cumulative contaminants of concern? The criteria should be clear and stated often, not found buried in an appendix.

Response: In the Draft Final FS/RAP, the constituent distributions are first discussed on page 18 and the significance of those distributions are evaluated. On page 40, the Draft Final FS/RAP explains that dissolved metals in shallow groundwater are not expected to pose a risk to aquatic receptors at the concentrations observed, and that vapor intrusion is the only complete exposure pathway to human receptors. Therefore, cleanup of dissolved metals, which are naturally occurring, in shallow groundwater is not proposed, but any potential vapor intrusion risk posed by volatile chemicals in shallow groundwater will be mitigated as described in the Draft Final FS/RAP. On the basis of the risk assessment, the Draft Final FS/RAP presents cleanup goals for the various constituents of concern. The cleanup goals are presented in the document for each media of interest (e.g., soil, soil vapor, and groundwater).

Comment 16.13: This document and the future RDIP needs to be conclusive, not piecemealed, not left up to chance, not allowed to leave the harder, more toxic parts till last. You should not allow a “staging” of the remediations. It will put workers, travelers, and new residents at risk. Please note that the environmentally preferred alternative would be to do a complete comprehensive clean up.

Response: Thank you for noting your preference is for a complete and comprehensive cleanup. After a review of the remedial alternatives, the Water Board has concurred that Alternative 3, which provides a combination of soil capping, excavation and treatment of pollutants, will provide comprehensive protection of the health of future Site users and the environment. Given the size of the Site, remediation will inherently need to be completed in phases, but this will be done as part of the Site grading process and the majority of pollutants will have been effectively addressed prior to building construction. Some pollutants, such as VOC impacts, will be further mitigated during building construction through engineering controls, such as the construction of vapor mitigation systems associated with the proposed building.

Comment 16.14: Being “exempt from beneficial use” (FS/RAP pg. 28) for water does not mean that you allow the toxic chemicals to migrate off site or are exempt from efforts to reduce the contamination, it merely means the end product won’t be used or consumed. Mitigations to reduce the impact should still be attempted. Every effort to not penetrate into the lower aquifer, should be paramount.

Response: The Water Board is committed to protecting the water resources of California. Toxic chemicals are being monitored to ensure they are not migrating off-Site or to underlying aquifers, and efforts will be made to reduce pollutants through treatment of VOC-impacted groundwater and excavation of soils where pollutants exceed cleanup goals and cannot be capped with five feet of clean soil. This will

further improve groundwater quality and reduce potential health risk by removing pollution sources.

Comment 16.15: While some of these toxins are “statistically insignificant,” you fail to speak to the cumulative effect if two more “statistically insignificant” products, event at low doses, will impact your health. The Zone 5 area with concentrated organochlorine pesticides also had chromium concentrations. What level is that cleaned up to? That’s why it should all go. You have to consider public acceptance. We don’t want a variety of cleanup levels or ineffective, unproven, further-polluting techniques. Clean it ALL up to drinking water standards. That was DTSC’s promise based on the Clean Water Act of 1972. We are waiting.

Response: The Draft Final FS/RAP assumes the effects of multiple pollutants are additive when determining cleanup levels for specific areas (see Section 4.1). Where pollutant concentrations are above cleanup goals, mitigation or remediation will be implemented to reduce exposure risks to acceptable levels. The proposed remedy will break the exposure pathway to constituents in soil, so there will be no cumulative effects on health, including in Zone 5.

In May 2019, the Water Board determined that shallow groundwater at the Site is not an acceptable source for drinking water because of high salinity levels in the water. Given that shallow groundwater is not a potential source for drinking water, cleaning the Site up to drinking water standards does not apply for this Site.

In addition, the Water Board followed established Federal and State criteria to determine the preferred remedial alternative for this Site, which includes revieing the potential short-term, as well as long-term impacts to the community. When looking at short-term impacts, such as air quality, noise, traffic and safety impacts, a cleanup of the Site to drinking water standards and removal of all constituents to below remedial action objectives (i.e., instead of establishing a five-foot soil cap or other barrier between future users and impacted soil) would introduce new safety risks, significantly increase greenhouse gas emissions, and cause additional impacts to the community and the surrounding environment. Therefore, the Water Board proposes to move forward with an effective remedy that combines soil capping, durable barriers, treatment and pollutant removal to ensure the long-term protection of human health of future Site users and the environment. All of the technologies that comprise the proposed remedy are effective and proven technologies.

The railyard was constructed on land that was located in San Francisco Bay prior to in-filling, and the water in the pores of this fill material is a combination of residual Bay water and precipitation. In their review, the Water Board noted the following:

“The poor ambient water quality in the (shallow water-bearing zone) SWBZ at UPC OU-SM and OU-2 is related to the fact that this shallow groundwater zone was originally under the saline waters of San Francisco Bay, is primarily recharged by local surface-water infiltration and landfill leachate and is subject to

evapotranspiration. Based on these characteristics, the groundwater in the SWBZ at both operable units should not be considered a potential drinking water supply."

The shallow fill-zone groundwater at the Site has never been suitable for use as drinking water and, therefore, will not be treated to drinking water standards.

Comment 16.16: We're looking for guidance, direction from the Water Board, not an "I don't know," "maybe," or "I assure you we're up to speed (Vic Pal 35:21, public meeting presentation). This FS/RAP does not bring confidence to many members of the public. Additional information is needed on Industrial Way before you can define the remediation techniques.

Response: The Water Board will require that BDI collect additional data when unexpected conditions are encountered and prior to implementing remediation and mitigation measures at the Site. This information will be incorporated into the RDIP, which is a detailed document that lays out the specifics for how the cleanup will be implemented at the Site on a parcel-by-parcel basis. The Water Board will conduct a detailed review of this document and only concur with its findings once satisfied that it concretely describes how remediation activities will be safely implemented at the Site to ensure the protection of the public. We will share the findings of the RDIP with the community to aid in understanding the community's concerns.

Comment 16.17: Since he asked, tell Howard Pearce why there is no housing allowed on the southern part of the rail yard. It is a Public Health Risk. It is the lowest sump in the area. It has the densest mix of toxic chemicals, many of which he proposes to ignore or leave in place. There is an industrial Petroleum Tank Farm adjacent to the property. You need to evacuate for a minimum of 1 mile during accidental leaks or fires. Kinder Morgan burns their excess fuel, soot pours into the air. It contains all the nasties of BTEX and any heavy metal that has hung in the refining process. It is a Public Health Risk. Please tell Howard it is a Public Health Risk.

Response: Howard's question was about the boundary for residential in Measure JJ, which is limited to the area north of a projection of Main Street that transects the site west to east rather than continuing its northwest to southeast trajectory.

17. Commenter: Anja Miller, Brisbane Resident

Comment 17.1: In response to your call for comments on the upcoming remediation plan for OU-2 of the Brisbane Baylands, in order to make sure you have all the relevant information on the site history, attached hereto is the initial report (1987) for Superfund status of the former Stauffer Chemical site located on Industrial Way, which is included in OU-2. More information on the subject is available from http://www.Brisbane411.com/baylands. As you know, the City of Brisbane is considering approval of the site for residential development. It should be noted that no Superfund cleanup was implemented only because "no vulnerable to toxics" population existed at that time. This situation has now changed. Your call for

comments indicates that no action will be needed on “hardscape” areas supposedly meaning those covered by concrete and asphalt. Naturally, the entire 2 city blocks of Industrial Way, including the highly toxic former Stauffer Chemical site and current automotive and other operations, are “hardscape.” Can it really be permissible to build housing on such soil coverage?

Response: Thank you for sharing this information. All aspects of the Site history, including the document referenced above, were taken into consideration as part of the development of the Draft Final FS/RAP.

The OU-2 Site, including the portions that comprised the former Stauffer Chemical Site, is not nor has it ever been considered a Superfund Site. As you note, it was not designated a Superfund site because there was not a population that could be made vulnerable to toxics at that time. The proposed remedy will protect future Site users by addressing or removing potential exposure pathways to the pollutants found at the Site allowing for future redevelopment uses that include both commercial and residential proposed uses.

Housing is currently not planned along the Industrial Way area of the Site. Currently that is anticipated to be part of the proposed life science campus. Should development plans change, the Water Board would work with BDI to conduct the appropriate remediation activities and sampling efforts to allow for the future buildings to be protective of future Site users.

Comment 17.2: As has been pointed out on previous occasions, the cleanup of OU-2 should more appropriately be supervised by the DTSC.

Response: OU-2 is overseen by the Water Board because the primary constituent of concern is petroleum products, which the Water Board has primary authority to regulate under California law. DTSC and the Water Board are sister agencies and follow similar regulations to ensure the safety of public health and the environment. In addition, Water Board and DTSC staff communicate frequently about the portions of the Baylands under their jurisdiction to ensure the same level of regulatory protection and oversight is applied to both sites.

Prepared by: vic pal **Date:** **12/2/21**

Vic Pal, Case Manager
San Francisco Bay Regional Water Quality Control Board
(510) 622-2403 or vic.pal@waterboards.ca.gov

Attachment 1 – Water Board Fact Sheet and Comment Period Extension Notice

Fact Sheet

Brisbane Baylands Operable Unit 2 –Cleanup Plan

Bayshore Boulevard, South of Geneva Avenue, Brisbane, CA

October 2020



Figure 1 – Site Map

The San Francisco Bay Regional Water Quality Control Board (Water Board) oversees environmental investigation and cleanup projects in the Bay Area and notifies the public of progress at key steps. This fact sheet provides information about a proposed cleanup plan, known as a Feasibility Study/Remedial Action Plan (FS/RAP), that will address soil, soil vapor (air in between soil particles) and groundwater contamination at the Brisbane Baylands Operable Unit 2 (OU-2) site located along Bayshore Blvd., south of Geneva Ave. in Brisbane (Site). The Site is shown in pink on Figure 1 above.

PUBLIC COMMENT PERIOD

October 28 – December 18, 2020

The Water Board invites you to review and comment on the FS/RAP for the Brisbane Baylands OU-2 Site. All comments must be received by 5 p.m. on December 18, 2020. Comments can be sent to:

Vic Pal
San Francisco Bay Regional Water Quality Control Board
1515 Clay Street, Suite 1400
Oakland, CA 94612
Vic.Pal@waterboards.ca.gov

PUBLIC MEETING

The Water Board will hold a virtual public meeting to provide information on the FS/RAP, answer questions, and obtain public comments.

DATE: November 18, 2020
TIME: 6:30 to 8:00 p.m.
JOIN VIA ZOOM:
https://bit.ly/3dIHnMl

JOIN BY PHONE: Dial 669-900-9128 and enter access code 843 9482 2081#

For help accessing the meeting please call Tracy Craig at 510-334-4866 (24/7).

Background

The approximately 140-acre Site occupies the southern portion of the former Southern Pacific Transportation Brisbane Railyard, which was used as a railroad switching yard from 1914 to 1960. After 1960, the Site was unused and today it is vacant with various foundations and building slabs

remaining (pink area in Figure 1). Universal Paragon Corporation, Inc. (UPC) owns the Site. In November 2018, the voters of the City of Brisbane approved Measure JJ to amend the General Plan to rezone the Site and surrounding properties for mixed residential, commercial and public uses. The Water Board also oversees the investigation and closure of the former Brisbane Landfill (blue area in Figure 1) jointly with the San Mateo County Department of Environmental Health. The California Department of Toxic Substances Control (DTSC) provides oversight for the investigation and cleanup of the northern area of the Southern Pacific Transportation Brisbane Railyard (green area in Figure 1).

Environmental Investigations

Since 1982, numerous environmental investigations have been conducted at the Site to characterize the presence, nature and extent of contamination. During the most recent round of investigations conducted in 2018 and 2019, over 1,120 samples were collected at the Site. Contaminants of concern in soil include metals which are found across the Site and are likely from imported fill material Southern Pacific used to backfill the area to build the railyard. There is also an area impacted with Bunker C oil and a localized area with elevated levels of volatile organic compounds (VOCs) in soil and groundwater.

In order to better assist with investigation and remediation activities, the Site was divided into six zones: Zone 1 – the northern portion of the former switching yard, Zone 2 – the southern portion of the former switching yard, Zone 3 – the former machine and erecting shop, Zone 4 – the former turntable and oil tank area, Zone 5 – the south disposal area and Zone 6 – the properties along Industrial Way. These zones and the location of contaminants are shown in Figure 2 at the end of this document.

Proposed Remedy

The FS/RAP describes the proposed cleanup alternatives, evaluates those alternatives and proposes a preferred remedy that will be protective of the health of the end user once each parcel has been developed, the health of the general public, and the environment. The proposed remedy includes:

- Establishing a minimum five-foot thick layer of clean soil or other durable hardscape (e.g., building foundations, pavement, etc.) protective cap over soil containing contaminants of concern at concentrations above cleanup levels in areas of the future development
- Excavating soil where the five-foot thick layer of clean soil or durable cover cannot be placed and either consolidating that soil underneath a clean soil cap or durable cover in another location on-Site, or transporting that soil to an off-Site, licensed disposal facility
- Excavating soil impacted with VOCs in one location along the border between Zones 4 and 6 and transporting that soil to a licensed, off-Site facility
- Treating groundwater to breakdown VOC contamination in groundwater around Zones 4 and 6
- Ongoing groundwater monitoring to confirm the effectiveness of groundwater treatment

Prior to any building construction, soil vapor testing will occur and, if required, soil vapor mitigation systems will be installed. Land use restrictions will also be placed across the Site that will prohibit the use of groundwater, describe protocols for the future safe handling of the remaining impacted soil underneath the protective covers, and require ongoing monitoring and maintenance of the protective covers, groundwater monitoring wells and any soil vapor mitigation systems.

Next Steps

The Water Board will review and consider all public comments before making a final decision on the draft FS/RAP. All comments must be provided to the Water Board by December 18, 2020. At the end of the public comment period, the Water Board will evaluate the comments received and make any

changes to the FS/RAP. A Responsiveness Summary will be distributed to all those who commented and provided contact information.

Should the FS/RAP be approved, UPC and its consultants would then prepare a Remedial Design and Implementation Plan (RDIP) that would include specific details about remediation activities including quantities of soil being excavated and imported, a detailed truck route, a health risk assessment for on-Site construction workers and the community during remediation, and a Site-specific health and safety plan that includes a variety of dust, odor, noise and traffic controls to protect the nearby community and minimize construction impacts to the greatest extent possible.

Schedule

Once the FS/RAP has been approved, UPC will begin preparing the RDIP and it is anticipated that these will be approved in 2021. The protective covers will be constructed while mass grading is implemented for the development construction, which is anticipated to begin following RDIP approval in late 2021. It is anticipated that the protective covers will be in place by 2023 when UPC anticipates beginning vertical construction. The Water Board will issue additional fact sheets once the RDIP has been approved and prior to the start of remediation construction. These fact sheets will provide specific information on remediation activities including the truck route and community protection measures that will be in place during remediation.

For More Information

To view the proposed FS/RAP and other technical reports for the OU-2 Site, please visit the State Water Board's GeoTracker website: https://geotracker.waterboards.ca.gov/search.asp (search for case ID/global ID **T10000000103**, then click on the "Report" link).

You may also contact the following individuals:

- Vic Pal, Water Board Case Manager, (510) 622-2403, vic.pal@waterboards.ca.gov
- Tracy Craig, Community Relations Consultant, (510) 334-4866, tracy@craig-communications.com

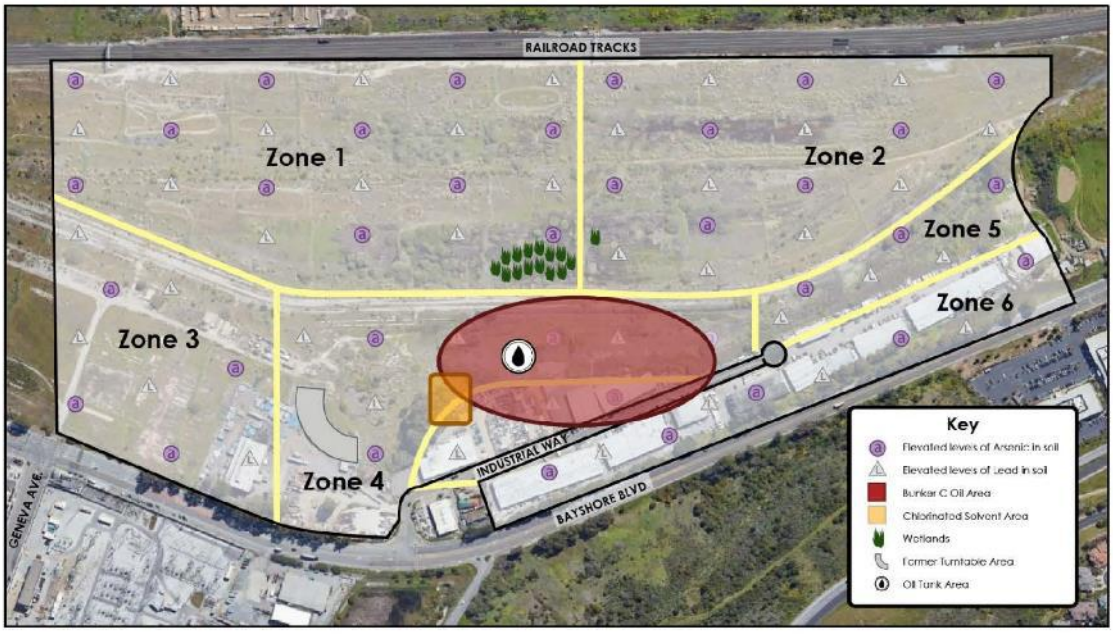


Figure 2 – Contaminant and Zone locations in OU-2

加州水控委情況說明書

布里斯班市 Baylands 第 2 號可操作單元 - 清理計劃

加利福尼亞州布里斯班市，Geneva 大道以南，Bayshore 大街

2020 年 10 月



圖 1 – 地點圖示 （布里斯班市垃圾填埋場（水控委）-藍色）

公眾意見徵詢期

2020年10月28日– 12月18日

水控委邀請您對布里斯班市Baylands 第2號可操作單元地點的該計劃被稱為可行性研究/補救行動計劃進行審核和評論。 所有意見必須在2020年12月18日下午五點前提交。可將您的意見提交至:

郵寄:
Vic Pal
San Francisco Bay Regional Water Quality Control Board
1515 Clay Street, Suite 1400
Oakland, CA 94612

電郵:
Vic.Pal@waterboards.ca.gov

公開會議

水控委將召開網上公眾會議，以提供有關FS / RAP的信息，回答問題並收集公眾意見.

日期: 2020年11月18日
時間: 晚上6點半到 8點
通過ZOOM與會:
https://bit.ly/3dIHnMl
通過電話與會: 撥打號碼 669-900-9128，輸入會議碼 845 6250 9039#

請隨時撥打510-334-4866 找Tracy Craig 尋求與會幫助。

舊金山灣區地方水質控制委員會（水控委）負責監督灣區的環境調查和清理項目，並在關鍵步驟上將進展情況通知公眾。 本情況介紹提供了有關擬議的清理計劃的信息，該計劃被稱為可行性研究/補救行動計劃（FS / RAP），該計劃將解決布里斯班市 Baylands 第 2 號可操作單元（ OU-2）的場地（以下簡稱場地），位於布里斯班市 Geneva 大道以南的 Bayshore 大街。 該地點在上方的圖 1 中以粉紅色標示出來。

背景資料

約 140 英畝的場地位於前南太平洋運輸公司布里斯班鐵路場的南部，該場地於 1914 年至 1960 年被用作鐵路調度場。1960 年後，該場址停止使用，如今空置並堆放了各種剩餘的地基用料和水泥預製板（圖 1 中的粉紅色區域）。 該場地由 Universal Paragon Corporation，Inc.（UPC）公司擁有。 2018 年 11 月，布里斯班市的選民批准了 JJ 提案來修訂該市總體計劃，以便將該場地和周邊物業重新劃分為住宅、商業和公用的混合用途區域。水控委還與聖馬刁縣環境衛生局和加利福尼亞州有毒物質控制局（DTSC）共同監督前布里斯班垃圾填埋場的調查和關閉使用（圖 1 中的藍色區域），以監督和清理前南太平洋運輸公司布里斯班鐵路站的北部區域（圖 1 中的綠色區域）。

環境調查

自 1982 年以來，在該場地進行了多次環境調查，以表徵污染的存在、性質和程度。 在 2018 年和 2019 年進行的最新一輪調查中，在該場地收集了 1,120 多個樣本。 土壤中令人關注的污染物包括在場地到處可見的多種金屬，這些金屬很可能來自南太平洋公司從別處引入的填埋材料，用於在該區域填海造田以建造鐵路場。 還有另外一個區域受到 C 型船用鍋爐燃料油的影響，另外一個局部區域的土壤和地下水中揮發性有機化合物（VOC）含量超標。

為了更好地協助調查和補救行動，該場地被劃分為六個區域：1 區 – 原調度場的北部； 2 區 – 原調度場的南部； 3 區 – 原機修車間，第 4 區-原調度轉盤和油罐區，第 5 區-南部處置區和第 6 區-Industral 路沿線的物業。 這些區域和污染物的位置如本文結尾処圖 2 所示。

擬議的補救措施

可行性研究/補救行動計劃描述了擬議的清理替代方案，評估了這些替代方案，並提出了一種首選的補救措施，該補救措施將在開發每個地塊後保護最終用戶的健康、公眾的健康和環境。 擬議的補救措施包括:

- 在未來待開發的區域內，在關注的污染物濃度高於清除水平的土壤上堆積起至少五英尺厚的干淨土壤或其他耐用的硬景觀（例如建築物地基，人行道等）的保護層。
- 在無法堆積五英尺厚的干淨土壤層或耐用覆蓋層的地方挖走土壤后，要麼在該場地另一位置將該土壤加固在乾淨的土壤覆蓋層或耐用覆蓋層下面，要麼將其運送到場地外獲得許可的棄置設施。
- 在 4 區和 6 區邊界的一個位置挖走受揮發性有機化合物影響的土壤，並將該土壤運送到場地外獲得許可的棄置設施。
- 處理地下水以分解 4 區和 6 區周圍地下水中的揮發性有機化合物污染。
- 持續進行地下水監測以確認地下水處理的有效性

在進行任何建築物建造之前，將進行土壤蒸氣測試，如果需要，將安裝土壤蒸氣緩解系統。 整個場地的土地使用限制也將受到限制，禁止使用地下水，並要求對保護覆蓋層下剩餘受污染土壤的未來安全處理方案、保護覆蓋層、地下水監測井和任何土壤蒸氣的緩解系統進行報告。

接下來的步驟

在對可行性研究/補救行動計劃草案做出最終決定之前，水控委將審查並考慮所有公眾意見。 所有意見必須在 2020 年 12 月 18 日前提交水控委。 在公眾意見徵詢期結束時，水控委將評估收到的意見並對可行性研究/補救行動計劃進行修改。 回應摘要將分發給所有提出意見並提供聯繫信息的人士。

如果可行性研究/補救行動計劃得到批准，UPC 公司及其顧問將起草補救行動設計和實施計劃（RDIP），其中將包含有關補救行動的具體細節，包括被挖走和引入的土壤體積、詳細的卡車行車路線、健康風險評估等、 對現場施工人員和社區在整治期間所制定得針對現場的健康與安全計劃，其中包括各種灰塵、氣味、噪音和交通控制措施，以保護附近社區並最大程度地減少影響。

時間表

一旦可行性研究/補救行動計劃獲得批准，UPC 公司將開始起草補救行動設計和實施計劃（RDIP），並且預計將在 2021 年獲得批准。堆積保護覆蓋層將在開發建設的土地平整時同時進行，預計在補救行動設計和實施計劃於 2021 年末獲得批准後，將開始堆積保護覆蓋層。預計當 UPC 公司計劃開始垂直建造時，保護覆蓋層將在 2023 年就位。一旦補救行動設計和實施計劃（RDIP）獲得批准，並且在開始補救整治之前，水控委將發布更多的情況說明書。這些情況說明書將提供更多細節，包括在補救整治過程中將採取的卡車行車路線和社區保護措施。

如欲瞭解更多詳情

如欲查看有關 OU-2 場地的擬議可行性研究/補救行動計劃和其他技術性報告，請訪問州水務局的 GeoTracker 網站：https://geotracker.waterboards.ca.gov/search.asp（用 T10000000103 搜索案例 ID /統一 ID，然後單擊“報告”鏈接。）

您也可以聯繫以下人士：

- 水控委個案經理 Vic Pal, 電話 (510) 622-2403,電郵 vic.pal@waterboards.ca.gov
- 社區關係顧問 Tracy Craig, 電話 (510) 334-4866,電郵 tracy@craig-communications.com

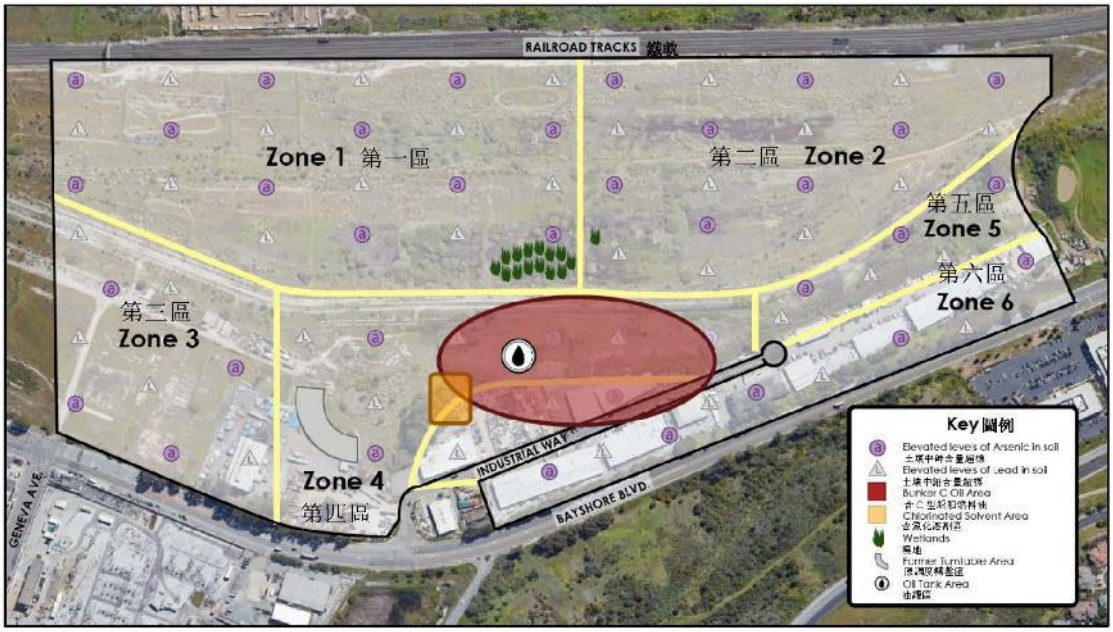


圖 2 – OU-2 中的污染物和區域位置

Hoja Informativa

Brisbane Baylands Operable Unit 2 – Plan de limpieza

Bayshore Boulevard, South of Geneva Avenue, Brisbane, CA

Octubre de 2020



Figura 1 – Mapa del Sitio

El *San Francisco Bay Regional Water Quality Control Board* (Comisión de Aguas) supervisa la investigación ambiental y los proyectos de limpieza en el Área de la Bahía y notifica al público sobre el progreso en los puntos claves. Esta hoja de informativa le brinda información sobre un plan de limpieza propuesto, conocido como un Estudio de factibilidad/Plan de acción remedial (FS/RAP), que abordará la contaminación de suelos, vapor del suelo (aire entre las partículas del suelo) y de aguas subterráneas en el sitio de *Brisbane Baylands Operable Unit (OU) 2*, ubicado a lo largo de *Bayshore Blvd.*, al sur de *Geneva Ave.*, en Brisbane (Sitio). El Sitio se muestra en color rosa arriba, en la Figura 1.

PERÍODO DE COMENTARIOS PÚBLICOS

28 de octubre al 18 de diciembre de 2020

La Comisión de Aguas le invita a revisar y comentar sobre el FS/RAP para el Sitio *Brisbane Baylands OU-2*. Todos los comentarios deben recibirse antes de las 5 p.m. el 18 de diciembre de 2020. Los comentarios pueden enviarse a:

Vic Pal
San Francisco Bay Regional Water Quality Control Board
1515 Clay Street, Suite 1400
Oakland, CA 94612
Vic.Pal@waterboards.ca.gov

REUNIÓN PÚBLICA

La Comisión de Aguas llevará a cabo una reunión pública virtual para brindarle información sobre FS/RAP, responder preguntas y obtener comentarios públicos.

FECHA: 18 de noviembre de 2020
HORA: 6:30 a 8:00 p.m.
REUNIÓN EN ZOOM:
https://bit.ly/3dIHnMl

ÚNASE POR TELÉFONO: Marque el 669-900-9128 y introduzca el código de acceso: 845 6250 9039#

Para obtener ayuda para acceder a la reunión, comuníquese con Tracy Craig al 510-334-4866 (24/7).

Antecedentes

El Sitio de aproximadamente 140 acres ocupa la parte sur del antiguo *Southern Pacific Transportation Brisbane Railyard*, que se utilizó como área de desvío de vagones de ferrocarril de 1914 a 1960. El Sitio no volvió a utilizarse después de 1960 y, actualmente está vacante, con restos de varios cimientos y losas de

construcción (área color rosa en la Figura 1). *Universal Paragon Corporation, Inc.* (UPC) es la propietaria del Sitio. En noviembre de 2018, los votantes de la Ciudad de Brisbane aprobaron la Medida JJ para modificar el Plan general para volver a zonificar el Sitio y las propiedades circundantes para una combinación de usos residenciales, comerciales y públicos. La Comisión del Agua también supervisa la investigación y el cierre del antiguo relleno Brisbane (área color azul en la Figura 1) en conjunto con el Departamento de Salud Ambiental del Condado de San Mateo y el Departamento de Control de Sustancias Tóxicas de California (DTSC) proporcionando supervisión para la investigación y limpieza del área norte de *Southern Pacific Transportation Brisbane Railyard* (área verde en la Figura 1).

Investigaciones ambientales

Desde 1982, se han realizado numerosas investigaciones ambientales en el Sitio para caracterizar la presencia, la naturaleza y el alcance de la contaminación. Durante la ronda más reciente realizada en 2018 y 2019, se recolectaron más de 1,120 muestras del Sitio. Los contaminantes preocupantes en los suelos incluyen metales que se encuentran en todo el Sitio y que probablemente provienen de material de relleno importado que *Southern Pacific* utilizó para rellenar el área para construir la terminal ferroviaria. También hay un área impactada con aceite *Bunker C* y un área localizada con niveles elevados de compuestos orgánicos volátiles (VOC) en los suelos y las aguas subterráneas.

Con el fin de ayudar mejor con las actividades de investigación y remediación, el Sitio se dividió en seis zonas: Zona 1 – la parte norte del antiguo patio de desvío de vagones, Zona 2 – la parte sur del antiguo patio de desvío de vagones, Zona 3 – el antiguo taller de mecánica y maquinaria, Zona 4 – la antigua plataforma giratoria y área de tanques de combustible, Zona 5 – el área sur de disposición y Zona 6 – las propiedades a lo largo de *Industrial Way*. Estas zonas y la ubicación de los contaminantes se muestran en la Figura 2, al final de este documento.

Remedio propuesto

El FS/RAP describe las alternativas de limpieza propuestas, evalúa esas alternativas y propone un remedio preferido que protegerá la salud del usuario final una vez que se haya desarrollado cada parcela, la salud del público general y el medio ambiente. El remedio propuesto incluye:

- Establecer una capa mínima de cinco pies de espesor de suelos limpios u otro elemento sólido duradero (por ejemplo, cimientos de construcción, pavimento, etc.) sobre los suelos que contienen contaminantes de preocupación a concentraciones superiores a los niveles de limpieza en áreas de desarrollo futuro
- Excavación de suelos donde no se puede colocar una capa gruesa o una capa duradera de cinco pies de suelos limpios consolidando esos suelos debajo de una capa de suelos limpios o una capa duradera en otra ubicación en el Sitio, o transportando esos suelos a un sitio externo de eliminación autorizado
- Excavación de suelos impactados con VOC en un lugar a lo largo de la frontera entre las Zonas 4 y 6 y transporte de esos suelos a un sitio externo de eliminación autorizado
- Tratamiento de aguas subterráneas para descomponer su contaminación por VOC alrededor de las Zonas 4 y 6
- Monitoreo continuo de las aguas subterráneas para confirmar la efectividad de su tratamiento

Antes de cualquier construcción, se realizarán pruebas de vapor de suelo y, si fuera necesario, se instalarán sistemas de mitigación de vapor de suelo. También se impondrían restricciones de uso de la tierra en todo el Sitio que prohibirían el uso de aguas subterráneas, describirían protocolos para el manejo seguro futuro de suelos impactados restantes debajo de las capas protectoras, y requerirían un monitoreo y mantenimiento continuo de las cubiertas protectoras, los pozos de monitoreo de aguas subterráneas y cualquier sistema de mitigación de vapor de suelo.

Próximos pasos

La Comisión de Aguas revisará y tomará en cuenta todos los comentarios públicos antes de tomar una decisión final sobre el borrador del FS/RAP. Todos los comentarios deben ser proporcionados a la Comisión de Aguas antes del 18 de diciembre de 2020. Al finalizar el período de comentarios públicos, la Comisión de

Aguas evaluará los comentarios recibidos y hará cualquier cambio al FS/RAP. Se distribuirá un Resumen de capacidad de respuesta a todos aquellos que comentaron y proporcionaron su información de contacto.

En caso de que se apruebe el FS/RAP, la UPC y sus asesores elaborarán Planes de diseño e implementación remediales (RDIP, por sus siglas en inglés) que incluirían detalles específicos sobre las actividades de remediación, incluyendo las cantidades de suelos que se están excavando e importando, una ruta detallada de camiones, una evaluación de riesgos para la salud de los trabajadores en el Sitio y la comunidad durante la remediación, y un plan de salud y seguridad específico del Sitio que incluye una variedad de controles de polvo, olor, ruido y tráfico para proteger a la comunidad cercana y minimizar los impactos en la mayor medida posible.

Calendario

Una vez que se haya aprobado el FS/RAP, la UPC comenzará a preparar los RDIP y se espera que se aprobarán en 2021. Las capas protectoras se construirán al mismo tiempo que se implemente la clasificación masiva para la construcción del desarrollo, que se espera comenzará después de la aprobación de RDIP a fines de 2021. Se anticipa que las capas protectoras estarán en su lugar para 2023 cuando la UPC calcula comenzar la construcción vertical. La Comisión de Aguas emitirá hojas informativas adicionales una vez que los RDIP hayan sido aprobados y antes del inicio de la construcción de remediación. Estas hojas informativas proporcionarán más detalles, incluyendo la ruta de camiones y las medidas de protección comunitaria que se implementarán durante la remediación.

Para más información

Para ver el FS/RAP propuesto y otros informes técnicos para el Sitio OU-2, visite el sitio web GeoTracker de la Comisión Estatal de Aguas GeoTracker website: https://geotracker.waterboards.ca.gov/search.asp (buscar por ID de caso/ID global **T10000000103**, luego haga clic en el enlace "*Report*"). También puede comunicarse con las siguientes personas:

- Vic Pal, Gerente de Casos de la Comisión de Aguas, (510) 622-2403, vic.pal@waterboards.ca.gov
- Tracy Craig, Asesora de Relaciones Comunitarias, (510) 334-4866, tracy@craig-communications.com

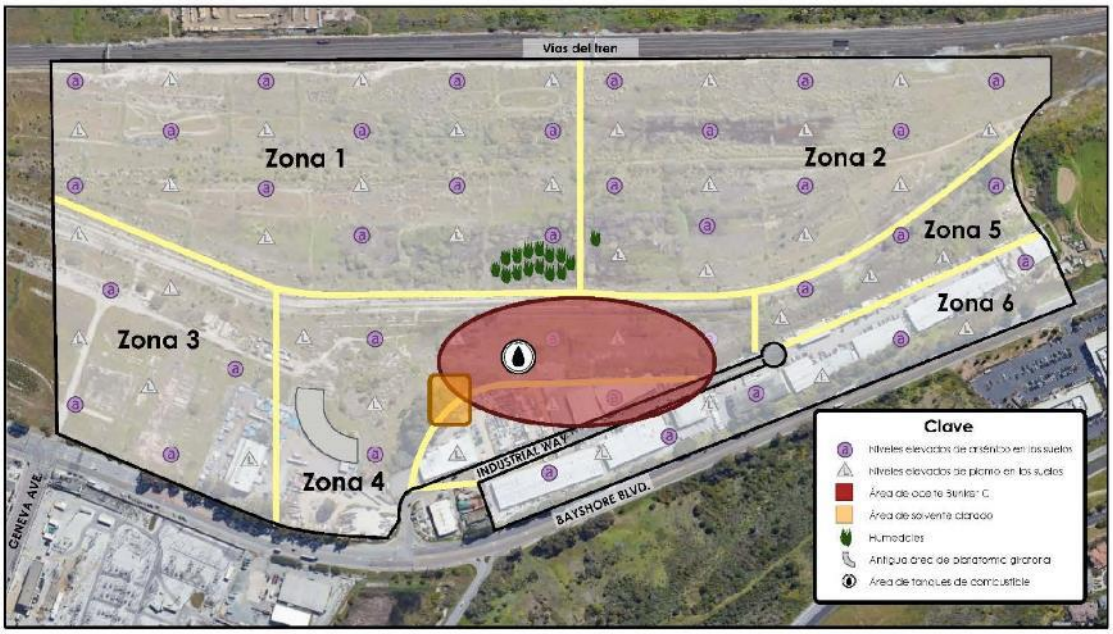


Figura 2 – Ubicaciones de contaminantes y Zonas en OU-2

Brisbane Baylands Operable Unit 2

Bayshore Boulevard, South of Geneva Avenue, Brisbane, CA

December 2020

Draft Cleanup Plan Available for Review
Public Comment Period Extended to January 31, 2021

The San Francisco Bay Regional Water Quality Control Board (Water Board) is extending the public comment period on the proposed cleanup plan, known as a Feasibility Study/Remedial Action Plan (FS/RAP), for the Brisbane Baylands Operable Unit 2 (OU-2) site through **January 31, 2021**. The original comment period was scheduled to run from October 28 through December 18, 2020.

Please send comments to Vic Pal, Caseworker, by mail to 1515 Clay Street, Suite 1400, Oakland, CA 94612 or via phone or email using his contact information below. A video recording of the November 18, 2020 public meeting along with copies of the project fact sheet, FS/RAP and other key documents can be found online at www.BaylandsOU2.com or at https://geotracker.waterboards.ca.gov/ (search for "Brisbane Baylands"). Hard copies of the FS/RAP and other documents are also available at Brisbane City Hall, 50 Park Place, Brisbane, CA 94005 during their open office hours on Mondays and Thursdays from 9 a.m. to 1 p.m.

If you have any questions or need help accessing the documents, please contact:

- Vic Pal, Water Board Caseworker, 510-622-2403, vic.pal@waterboards.ca.gov
- Tracy Craig, Community Relations, 510-334-4866 (24/7), tracy@craig-communications.com

清理計劃草案供您審核
公眾意見徵詢期延長至2021年1月31日

舊金山灣區地方水質控制委員會（水控委）延長了對布里斯班Baylands可操作單元2（OU-2）的擬議清潔計劃（稱為可行性研究/整治行動計劃（FS / RAP））的公眾意見徵詢期至**2021年1月31日**。原先計劃的公眾意見徵詢期為2020年10月28日至2020年12月18日。

請將意見郵寄至1515 Clay Street，Suite 1400，Oakland，CA 94612給案例負責人Vic Pal，或使用下面的聯繫方式通過電話或電郵發送意見。可以在www.BaylandsOU2.com 或https://geotracker.waterboards.ca.gov網站上找到2020年11月18日公開會議的錄像以及項目簡介、可行性研究/整治行動計劃和其他關鍵文件的副本（搜索"Brisbane Baylands"）。 可行性研究/整治行動計劃和其他文件的紙質版也可在星期一和星期四的上午9點至下午1點的開放時間在加利福尼亞州布里斯班市政廳供您審閱，地址是：50 Park Place，Brisbane，CA 94005。

如果您有任何疑問或需要幫助來查閱文件，請聯繫：

- 維克·帕爾（Vic Pal），水務局案例負責人，電話：510-622-2403，電郵：vic.pal @ waterboards.ca.gov
- 特雷西·克雷格（Tracy Craig），社區公關，電話：510-334-4866（每日24小時/每周7天），電郵：tracy @ craig-communications.com

Borrador del plan de limpieza disponible para revisión
Período de comentarios públicos extendido hasta el 31 de enero de 2021

El *San Francisco Bay Regional Water Quality Control Board* (Junta de Agua) está extendiendo el período de comentarios públicos al plan de limpieza propuesto, conocido como Estudio de factibilidad/Plan de acción de remediación (FS/RAP) para el sitio de la Unidad Operable 2 de Brisbane Baylands (OU-2) hasta el **31 de enero de 2021**. El período de comentarios original estaba programado del 28 de octubre al 18 de diciembre de 2020.

Envíe sus comentarios a Vic Pal, Trabajador del caso, por correo a *1515 Clay Street, Suite 1400, Oakland, CA 94612* o por teléfono o correo electrónico utilizando su información de contacto que aparece a continuación. Puede encontrar una grabación de video de la reunión pública del 18 de noviembre de 2020 junto con copias de la hoja de datos del proyecto, FS/RAP y otros documentos clave en línea, en www.BaylandsOU2.com o en https://geotracker.waterboards.ca.gov/ (busque *"Brisbane Baylands"*). Las copias impresas del FS/RAP y otros documentos también están disponibles en *Brisbane City Hall, 50 Park Place, Brisbane, CA 94005* durante su horario de oficina, los lunes y jueves, de 9 a.m. a 1 p.m.

Si tiene alguna pregunta o necesita ayuda para acceder a los documentos, comuníquese con:

- Vic Pal, Trabajador de caso de la Junta de Agua, 510-622-2403, vic.pal@waterboards.ca.gov
- Tracy Craig, Relaciones con la comunidad, 510-334-4866 (24/7), tracy@craig-communications.com

Attachment 2 – Community Communications

City of Brisbane Updates

City Hall Phased Re-Opening Schedule: Mondays & Thursdays
9am - 1pm

SEARCH

COMMUNITY DEVELOPMENT

OU-2 Comment Period Starts 10/28, Hard Copy Reports Available to View at City Hall During Public Office Hours; Reports Accessible To View Online As Well

CALIFORNIA
Water Boards
STATE WATER RESOURCES CONTROL BOARD
REGIONAL WATER QUALITY CONTROL BOARDS



To help community members review the draft Feasibility Study/Remedial Action Plan (FS/RAP) for the OU-2 portion of the Brisbane Baylands site, the San Francisco Regional Water Quality Control Board (Water Board) will have a hard copy of the report available at Brisbane City Hall during City Hall public office hours – Mondays & Thursdays, 9am – 1pm. A Fact Sheet has also been prepared and will be arriving in mailboxes next week.

If you plan on coming to City Hall, please indicate when you check in at the front door that you would like to view the reports so you can be best directed to them. You will be required to follow all COVID-19 safety protocols including wearing a face covering and staying home if you are sick. Should you have any questions about accessing the documents at City Hall during public office hours, please call the Planning Department Main Line at: (415) 508-2120.

You may also access electronic versions of the draft FS/RAP anytime from the comfort of your home online at www.BaylandsOU2.com. If you have any questions or have trouble accessing the documents online, please contact Tracy Craig at (510) 334-4866 or tracy@craig-communications.com.

The 52-day comment period starts on Wednesday, October 28th and runs until Friday, December 18, 2020. Comments can be mailed to Vic Pal, Water Board Caseworker,

1515 Clay Street, Suite 1400, Oakland, CA 94612 or emailed to Vic.Pal@waterboards.ca.gov.



Home Sitemap Staff Login Webmail Time Reporting

50 Park Place, Brisbane, CA 94005 Contact Us

a municode design

STAR

City of Brisbane Monthly Newsletter
November 2020 Volume 17, Issue 9

Public Comment Period for Draft Remedial Action Plans for the Environmental/Soils Cleanup of the Baylands Coming Soon

The San Francisco Regional Water Quality Control Board (Water Board) has announced the draft Feasibility Study/ Remedial Action Plan (FS/RAP) for the environmental/soils cleanup of a portion of the Brisbane Baylands site will be available for public comment from October 28 to December 18, 2020. The Water Board will mail a fact sheet about the proposed cleanup plan to all Brisbane residents and will be hosting a public meeting via Zoom on November 18, 2020 from 6:30 – 8:00pm. You can access the Zoom meeting via: **https://bit.ly/3dlHnMI**. For more information or if you need help accessing the meeting, please contact Tracy Craig at (510) 334-4866 or **tracy@craig-communications.com**.

The California Department of Toxic Substances Control (DTSC) anticipates that the draft FS/RAP for the environmental/ soils cleanup of the portion of the Brisbane Baylands site it oversees will be available for public comment this fall as well. Dates for this public comment period have not been selected yet so stay tuned for more information.

Enter your Address and Know Your Zone

OU-2 Public Comment Period Extended to 1/31

The Water Board hosted a public meeting via Zoom this past Wednesday where they also announced that the public comment period for the OU-2 draft FS/RAP will be extended through January 31, 2021. See the meeting recording here:



To help community members review the draft Feasibility Study/Remedial Action Plan (FS/RAP) for the OU-2 portion of the Brisbane Baylands site, the San Francisco Regional Water Quality Control Board (Water Board) has hard copy reports available at Brisbane City Hall during public office hours – Mondays & Thursdays, 9am – 1pm, or by appointment if needed.

More Information and the Electronic Versions of the OU-2 Draft FS/RAP

DTSC Public Comment Period on OU-SM Cleanup Plan: 11/16/20 - 2/15/21

City Manager Weekly Blast – 1/22/21

https://spark.adobe.com/page/OiVpmK6w7KsmL/

Baylands Update



City Manager Weekly Blast – 1/22/21

https://spark.adobe.com/page/OiVpmK6w7KsmL/

Public Comment Periods: Now Open but Closing 1/31 for OU-2 and 2/15 for OU-SM

The San Francisco Regional Water Quality Control Board's (Water Board) public comment period on the draft environmental cleanup plan, known as a Feasibility Study/Remedial Action Plan (FS/RAP), for the OU-2 portion of the Brisbane Baylands site ends on **Sunday, January 31, 2021**.

The Water Board encourages you to review and provide input on the draft cleanup plan. You can view the draft FS/RAP, a recording of the November 18 Water Board public meeting, and other key documents online at BaylandsOU2.com.



Submit comments to vic.pal@waterboards.ca.gov

For more information or if you need help accessing the documents, please contact Tracy Craig at (510) 334-4866 or tracy@craig-communications.com.

The City submitted its formal comments on the draft cleanup plans, which can be found below:

City's Comments on Draft Feasibility Study/Remedial Action Plan for OU-2 Site
City's Comments on Draft Feasibility Study/Remedial Action Plan for OU-SM Site

WHAT HAPPENS AFTER THE PUBLIC COMMENT PERIODS CLOSE?

State regulatory agencies will evaluate the draft cleanup plans to ensure residential units at ground level (in OU-SM and the northern portion of OU-2, per preliminary plans) are able to be built and future residents housed safely. The developer will then submit design documents as well as monitoring plans to the regulatory agencies which will provide the details of the proposed remedies. The state agencies will review and must approve the documents before anything moves forward. See an overview of the Brisbane Baylands review and approval process here.

Brisbane Baylands Community Advisory Group (BBCAG) Updates

From:	clara johnson
To:	iris gallagher; Carolyn Parker; Mary Goodart gutekanst; O"Connell Terry; Madison Davis; Bill Dettmer; clara johnson; Fran Martin; Dana Dillworth; Mae Swanbeck
Cc:	asha.setty@dtsc.ca.gov; Nicole Yuen; Vic Pal; Michele Salmon; ania miller; Debra Horen; Beth Grossman; Randy Breault; Howard Pearce; Tony Verreos; Prem Lall; John Swiecki; Ray Miller; Barbara Ebel; Tracy Craig; John Promani; Alyx Karpowicz
Subject:	PUBLIC MEETINGS via Zoom for Public Comment Periods for two Remedial Action Plans, one from RWQCB (on OU-2) and one from DTSC (on OUSM)
Date:	Thursday, November 12, 2020 2:05:13 PM

Dear BBCAG and Friends

The BBCAG has an important role as an advisory body to both the RWQCB and the DTSC. Our role is also important because we are constituted to represent the communities of Brisbane, Visitacion Valley/Little Hollywood (San Francisco) and Bayshore (Daly City). Our comments are needed on two Remedial Actions Plans that have been drafted to address two diifferent geographic area of the Baylands.

The subject of the Regional Water Quality Control Board's is the Baylands Data Gap Investigation of OU2, Southern Railyard You have received a fact sheet from "Water Boards" , BARWQCB. It includes **the time and date of the Public Meeting, November 18, 2020 at 6:30 to 8:00pm.** There are instructions on how to join the Zoom meeting on the internet <https://bit.ly/3dlHnMl> or by phone, 669-900-9128 and enter access code 84394822081#. If you need help accessing the meeting, call Tracy Craig at 510 334 4866 anytime.

In order to prepare your questions or comments on the Draft Remediation Plan, you should read the fact sheet and go to the Geotracker website https://geotracker.waterboards.ca.gov/profile_report?global_id=T10000000103 click on the "site maps/documents" in order to access the Draft FS/Remediation Plan and the Data Gap Investigation Report.

A hard copy of the Draft Feasibility/Remediation Plan and the Data Gap Investigation Report is available at City Hall for review by appointment with City of Brisbane, Monday through Thursday. 9 am to 1 pm. More information is available at <www.BaylandsOU2.com>

I am very pleased to inform you that both the WaterBoard (RWQCB) and Dept of Toxic Substance Control have both **granted our requests for an extension of the public comment periods to more than 90 days.** The WaterBoard's public comment period which began on **October 28, 2020 will end on January 31, 2021.**

The Dept. of Toxic Substance Control's Draft Feasibility Study/Remediation Plan for OUSM (OU1) soil. soil vapor and a portion of the groundwater will begin on **November 16, 2020 and end February 15, 2021. DTSC's Public Meeting will be a Zoom meeting on January 7, 2021.** There will be hard copies at City Hall of their Data Gap Investigation and draft RAP. The web addresses to access those documents will be provided soon

These extensions will give us all chance to review the data gap investigations and the the draft remediation plans. If

To the best of my knowledge, this will be the last time we will be reviewing draft remediation plans for OUSM(OU1) and OU2.
The exception would be if the groundwater monitoring or other testing indicated greater contamination which required more remediation.

Let's do our best to review these documents and make comments despite all the distraction and difficulties.

Please contact me with your questions and comments. If you want to have an additional one or two BBCAG Zoom meetings on these draft RAPs, let me know.

I want to thank Asha Setty and Nicole Yuen of DTSC and Vic Pal, BARWQCB and Tracy Craig and John Promani of Craig Communications for their help.

Thank-you

Clara Johnson
BBCAG, Acting Chair

From:	clara johnson
To:	Carolyn Parker; Dana Dillworth; Fran Martin; iris gallagher; Madison Davis; Mae Swanbeck; Mary Goodart gutekanst; clara johnson; Bill Dettmer; O"Connell Terry
Cc:	asha.setty@dtsc.ca.gov; Nicole Yuen; Vic Pal; Tracy Craig; John Promani; Prem Lall
Subject:	Comments for Waterboard on OU2 fs/RAP due 1/31/21
Date:	Monday, January 25, 2021 10:39:01 PM

Hello BBCAG

On 1/19/31, Asha sent us an email that contained links to the two Public Mtgs. relating to the two draft RAPs we are considering. I appreciate her efforts.

I watched the Waterboard meeting to help me focus on developing comments. I thought you might want to do the same. I also wanted to remind you of the 1/31/21 deadline. I know that you have the email and street address for the comments. If you prefer to send them to me by 1/30/21, I will forward them for you.

If you have any questions or comments, please contact me.

Thank-you

Clara Johnson
Acting Chair, BBCAG
415 468 4195

Attachment 3 – Comment Letters

From: Pal, Vic@Waterboards
To: John Pramant; Tracy Slaki
Subject: Fw: Comments from 11/18 Water Board meeting
Date: Monday, November 23, 2020 10:58:07 AM

FYI...

From: Prem Lall <premlall@yahoo.com>
Sent: Sunday, November 22, 2020 6:48 PM
To: Pal, Vic@Waterboards <Vic.Pal@waterboards.ca.gov>
Cc: Clara Johnson <clara-a-johnson@sbcglobal.net>
Subject: Comments from 11/18 Water Board meeting

EXTERNAL:

Hello Vic,

I am following up on the Brisbane Baylands OU-2 Site meeting from 11/18 (meeting video posted at https://youtu.be/DNxxOQAh9dI) at which public comments were requested.

The issues I raised involved the following, in case you need them in writing:

1. With regard to the Operation & Maintenance plan for the OU-2 site, I asked whether in the case of the developer declaring bankruptcy and becoming incapable of financial responsibility for the plan the City of Brisbane and its taxpayers would become financially responsible and liable.

2. Nicholas Targ of Holland & Knight (Outside Environmental Counsel re the Baylands) mentioned that the developer would be responsible for the Operation & Maintenance plan for the OU-2 site for a period of 30 years (starting point of 30-year period not stated) and that a bond would be funded to ensure that in case of financial incapacity on the part of the developer, the Operations & Maintenance plan would continue to be funded for the 30-year period.

3. I requested that the details of the bond referenced by Mr. Targ be made readily available to anyone in Brisbane who wished to see them and that a timetable be provided by which the details would be made available in the near future.

I would also like to raise another issue that I did not raise during the meeting, and that is of the Midway Village residences in Daly City located approximately 1000 feet from the OU-2 site, near Schwerin Street at Midway Drive. You can see a map of the location of Midway Village at this link: https://www.google.com/maps/place/Midway+Village/@37.7022149,-122.4148511,15z/data=!4m5!3m4!1s0x0:0x597fceff8a9960a1!8m2!3d37.7022149!4d-122.4148511

Residences were built on this property which the developer declared to be safe, but there was so much toxicity in the soil beneath these residences that the people living there began to experience health problems including "...lung and stomach cancer, asthma and bronchitis, anemia and blurred vision. Women suffered miscarriages, stillbirths, infertility, and other reproductive maladies, while children endured skin rashes and frequent nosebleeds." (See the full article about these Midway Village maladies at https://www.sfweekly.com/news/what-lies-beneath/ published in 2006, and there are several other articles about them).

I do not want to see what happened at Midway Village to happen the future residents at the OU-2 site. The developer claims that there will be a cleanup of the toxins there, but the developer of Midway Village made similar claims which turned out to be false and/or misleading.

Please read the SF Weekly article mentioned above carefully: "In its review, meanwhile, the EPA's Environmental Justice Advisory Committee offers a harsher critique of the cleanup. The panel faults the DTSC for disputing the need for more soil and groundwater testing of petroleum hydrocarbons, including benzene, a carcinogen linked to leukemia and anemia in humans. Based on the agency's sampling results, the report states, the degree to which such compounds contaminate Midway remains uncertain 'and no remediation [has been] done that would prevent ongoing exposure.'"

Thank you.

Prem Lall
Brisbane

City of Brisbane
50 Park Place
Brisbane, CA 94005-1310
(415) 508-2100
(415) 467-4989 Fax

January 6, 2021

Vic Pal, Case Manager
San Francisco Bay Regional Water Quality Control Board
1515 Clay Street, Suite 1400
Oakland, CA 94612

Subject: Draft Feasibility Study/Remedial Action Plan for UPC OU-2 Site

Dear Mr. Pal:

Thank you for the opportunity to review and comment on the draft Feasibility Study/Remedial Action Plan ("FS/RAP") for Universal Paragon Corporation ("UPC") Operable Unit 2 ("UPC OU-2"), an approximately 140-acre parcel of land located in the southern portion of the former Southern Pacific railyard located in Brisbane, California. In reviewing the draft FS/RAP, the City of Brisbane ("City") offers the following comments:

1. First and foremost, the City wants to make sure that UPC implements a remedy that is (1) protective of human health and the environment and (2) consistent with Measure JJ. In doing so, the cost of remediation should not be the driver in the remedy selection process.
    a. Given that the preferred remedy results in most of the contamination being left in place, the City would like to see some mass removal of the most contaminated soil. Therefore, it is the City's preference that material containing chemical concentrations in excess of State of California Total Threshold Limit Concentrations ("TTLC") in the upper two feet of existing soil be excavated and disposed of at an off-site facility in accordance with applicable laws and regulations, rather than simply being left in place and capped.

2. Conceptually, with proper financing and implementation, the proposed remedy in the UPC OU-2 FS/RAP should be protective of current and future City residents and workers (both onsite and offsite) and the environment. Nevertheless, information regarding current soil vapor conditions and the extent of the chlorinated volatile organic compound ("CVOC") impacted area are not available and specific details about how the remedy will be implemented are not presented in the FS/RAP.

To address potential concerns regarding the protectiveness of the remedial actions to be implemented and their compliance with the City's requirements and standards, including Measure JJ, the City requests to remain engaged with UPC and the San Francisco Bay Regional Water Quality Control Board ("Water Board") during the Implementation phase of the environmental remediation process. More specifically, the City would like to be provided the opportunity to review and comment on the future Remedial Design Implementation Plan and other UPC submittals to the Water Board regarding topics such as:

a. Cap and utility corridor design;
b. Soil vapor sampling;
c. Soil survey/assessment of the Industrial Way area;
d. Evaluation and treatment of CVOC impacts to soil and groundwater in the CVOC-impacted area;
e. Soil management plan;
f. Vapor intrusion assessments;
g. Vapor intrusion mitigation system design;
h. Indoor air sampling;
i. Construction mitigation measures (e.g., dust control plan, stormwater pollution prevention plans, etc.);
j. Air monitoring;
k. Soil excavation, grading, and management;
l. Import fill standards;
m. Haul routes and transportation procedures;
n. Long-term maintenance plans including associated financial assurances;
o. Final sea rise analysis (to confirm that potential impacts due to rising groundwater levels are addressed in addition to potential inundation threats); and
p. Land use restrictions.

Thank you for your consideration of these comments. Please contact me at 415-508-2113 should you have any questions regarding this letter.

Sincerely,

Karen Cunningham
Mayor, City of Brisbane

Cc: Clay Holstine, City Manager
John A. Swiecki, AICP, Community Development Director
Randy Breault, P.E., Director Public Works
Kiana Amiri-Davani, Edgcomb Law Group LLP

JANUARY 28, 2021

TO: Vic.Pal@waterboards.ca.gov

FROM: Brisbane Baylands Community Advisory Group (BBCAG)
Via Clara Johnson, Vice Chair and Acting Chair
clara-a-johnson@sbcglobal.net ph. 415-4684195

SUBJECT: BBCAG COMMENTS ON DRAFT FS/REMEDIAL ACTION PLAN FOR BRISBANE BAYLANDS 0U-2

BBCAG appreciates the opportunity to comment on the Brisbane Baylands OU-2 FS/DRAP.

The BBCAG thinks it is important that the synergistic and additive impacts of the chemicals of potential concern and the metals of concern present on the site be determined and be considered in assessing the harm it will cause to human health and to the environment. If that information is not available, then the evaluation of potential harm should be included as soon as it becomes available.

The European Union list of Chemicals of Concern that was adopted by California. If it lists chemicals that are present on OU-2 but which were not investigated and evaluated then those chemicals should be added to the DRAP, evaluated and remediated.

You have chosen Alternative 3 as the proposed action plan. It contains a provision to place Volatile Organic Compounds and Petroleum Hydrocarbons and metals of concern under hardscape (concrete or asphalt). Hardscape is porous and will, over time, allow vapors from these chemicals to escape into the air. The amount of these volatile chemicals could be so densely packed under one area of hardscape or simply be, under so much hardscape, multiple acres of it that it would create a pathway to inhalation by the people who visit, work there or who live nearby.

A second concern about the placement of the volatile chemicals is the margin of error that is used to make sure the chemicals are not too close to the edge of the hardscape. There should be a specific distance from the edge of the chemical placement and the edge of the hardscape that cannot be decreased no matter what the conditions are. If there is no hardscape between the VOCs and the soil cap then once again there will be a pathway to human inhalation. A third concern is the possibility is that the hardscape will be disturbed by workers for road repair, landscaping, utility installation or repair or intrusion of surface water. One of these events happens fairly frequently. The contamination is found all over the site and there may be a substantial amount of chemicals to be sequestered under the hardscape. Are you going to clearly mark the many areas that should not be disturbed clearly enough so that all the people involved in the numerous types of activity mentioned will be aware. You need to rethink this plan because there isn't sufficient protection of human health and the environment.

Soil Vapor Monitoring Systems should be placed in all buildings, residential, commercial and public. Soil Vapor barriers should be placed below all buildings. The systems should be monitored once a quarter to make sure they are functioning. Soil Vapor barriers could be disturbed by earthquakes, liquefaction, grading, pressure from salt water intrusion or groundwater pathway shifting due to any of the above causes.

The soil cap should be more than five feet deep at its thinnest. It should be at least ten feet deep in order to provide a margin of error. The public should be notified within a week if the soil cap has had its integrity compromised or if any other safety system has been compromised. The public should be told within a week what has happened, what the risks are and when the integrity of the safety system is restored. There should be an agreed upon method of notification. The operational monitoring systems semi-annual reports should be easily available And any changed conditions should be transmitted to the public including anyone who regularly visits, lives or works on OU-2.

BBCAG Comments pg. 3

Why isn't the FS/DRAP specifically consistent with the EPA rather than generally consistent with U.S. EPA Guidelines for Conducting Remedial Investigations as it states on Pg. 1?

On page 34 of volume 2 of the DRAP, it states that the incremental non cancer risk and excess cancer risk is two times higher from arsenic in the soil over background. To what level of risk and by what means will you reduce that risk using Alternative 3. Shouldn't it be reduced to near background?

The RDIP should be presented to the public when it is in draft form. It provides a more specific description of exactly what will be done to carry out the Remedial Action Plan. The public should have a chance to ask questions and offer comments.

The BBCAG restates our view that there should not be any residential uses on any part of the Baylands including OU-2.

There is a statement on page 67 of the FS/DRAP that says, "..to ensure the protection of future users of the site by breaking the pathway to impacted soil". It is made within a section on soil capping. We look at the many toxic contaminants that are found in ou-2 and we conclude that whatever buildings that are built here should be separated from the ground level by pillars (on the perimeter and within It) that would allow air to flow between the ground level and the floor of the structure. We think that this necessary to protect human health even with all the remedial actions that are called for in Alternative 3.

The information on truck trips to either import soil for the soil cap indicates that over 100,000 truck trips of 12 cubic yard capacity will be required for the construction of the soil cap. The soil that needs to exported for disposal requires another 1000 truck trips. All of these trips will have a significant impact on traffic in the area. It will also create a significant amount of greenhouse gas. The rules and routes used must be carefully designed to lessen the disruption caused by

this project on surrounding communities and U.S. 101. The trucks used for the soil hauling must be zero emissions vehicles. These activities are projected to take place three to six years into the future and the efforts to blunt the effects of Climate Change will be even more of a priority than they are today. There are other remedial activities that occur totally within the boundaries of the Baylands. These trips must be taken into account when calculating greenhouse gas emissions and noise and what must be done to mitigate impacts.

In section 2.2 of the Health Risk Assessment, it states that deep groundwater that meets standards for drinking water should be considered a potential source of drinking water. The BBCAG strongly opposes this decision. There is not guarantee that this deep groundwater will remain untainted there are many activities on the e.g. excavating, pile driving and other disturbance caused by construction that could disturb the path of the groundwater. Another possibility is salt water intrusion from rising sea water

The Remedial Design and Implementation Plan must be made public in its draft form and must be subject to public comment. A public meeting must be held to explain to the public.

In the last few hundred pages of this document, there are appendices that discuss detects and non-detect and sub-categories of non-detects of a number of COC's and MOC's in soil and in groundwater. There should be a key that explains the meaning of detect and non-detect and the varieties of both and the sub-categories because it is very difficult for the public to decipher these pages.

A number of years ago, the BBCAG repeatedly requested that we be allowed to see the environmental investigations that are a part of the history of this site and are included in this document. We were told that RWQCB wasn't sure if it could make the documents public. It would have been helpful if we had been allowed to see these documents year ago. We request that in the future, environmental

investigations be made available when they are reviewed and accepted by RWQCB.

In the Trench Model discussion evaluating risks from soil vapor rising from contaminated groundwater in a trench, why was the Virginia State Model used. Isn't there s California Model to use?

The RWQCB or Cal EPA should suggest to the California Legislature that new laws more protective of human health and the environment be put in place. Laws that are based on more recent research that is expansive rather than narrow in its scope of possible additive and synergistic effects from the combination of many toxic chemicals and metals. Perhaps, the loss of diversity of animal and plant species and the expectation that 1 in 2 men will get cancer in their lifetime and 1 in three women will get cancer result from the current regulatory approach. The laws we have now that allow from 1 to 100 extra cases of cancer to result from one project are helping drive those rates.

We appreciate that this document is the result of considerable effort on the part of RWQCB. We thank you for considering our comments. Please acknowledge the receipt of these comments.

Sincerely

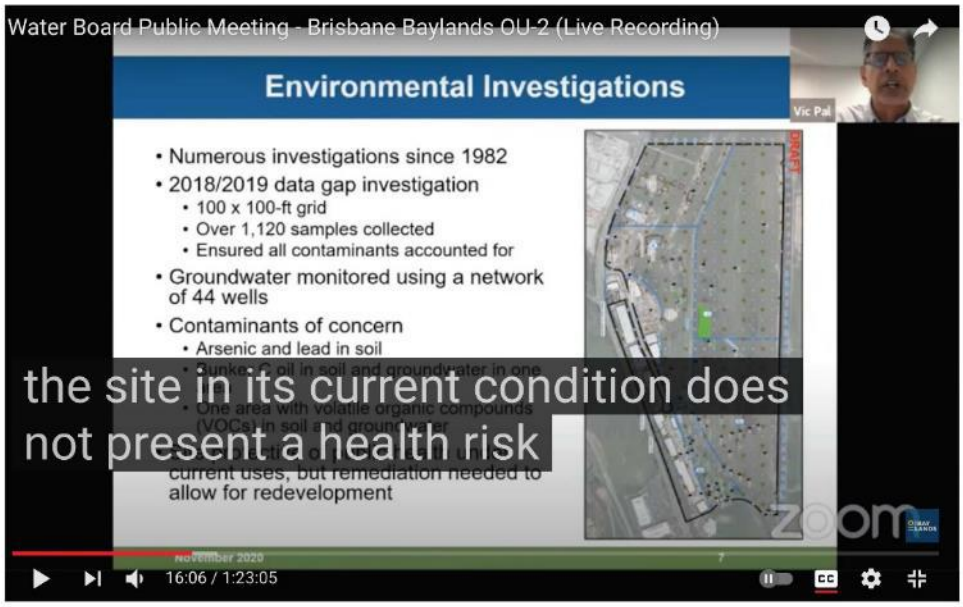
Clara Johnson
Acting Chair, Vice Chair
Brisbane Baylands Community Advisory Group (BBCAG)

To: Vic Pal, Waterboard
From: Dana Dillworth
Re: FS/RAP Brisbane Baylands OU2
January 31, 2021

California Waterboard's mission is :
"to preserve, enhance, and restore the quality of California's water resources and drinking water for the protection of the environment, public health, and all beneficial uses, and to ensure proper water resource allocation and efficient use, for the benefit of present and future generations."

How can the preferred remedial action and standards be anything other than to remove the toxins and bring it up to drinking water standards, Alternative 4? You have failed to meet your objective for the reasons contained herein.

I am concerned about misstatements that are circulated as fact. How is it possible that lands under an Imminent and Substantial Endangerment Order from a multitude of known and yet to be discovered toxins with multiple avenues of transmission is of no health risk in its current condition, nor pose any risk to aquatic life? The Baseline Health Risk Assessment incorrectly chirps this same notion. I am concerned that this "all is well" "we're exempt" attitude, when repeated from the Waterboard will produce lesser beneficial results.



On numerous occasions, when these lands were under DTSC's order, we had to evict homeless people, stop weekend vegetation "clearings" (bull dozing contaminated soil,) stop parties and raves at the Roundhouse, stop bottle and treasure hunters, stop kids from creating bike moguls and RC race tracks, and control parking dust from Cow Palace events. How are the consultants for this property unaware of its present dangers? They should be making

recommendations for an immediate layer of clean soil, for greater caution signage to protect the unaware public rather than make false statements that there are not any health risks on OU2 in its current condition.

It is painful for me (due to a disability) and upsetting to review these documents and ask, after 30 plus years (1988) of allowing the landowners to leak toxins into the bay, this is all we get? Maybe more wells, maybe not, maybe a pilot liquefaction program, maybe the toxins stay, maybe they go, maybe effective remedies, maybe not.



This document is insufficient as a legal guiding document as it doesn't have the sense of urgency to stop these toxins from leaking into the bay… Thirty years of leaking, enough is enough! If anything, you should IMMEDIATELY require a boon and detention basin at the "outflow area" where the highest VOC's are detected in the ground and surface water.

The Data Gap Investigation of 11/27/18, is woefully inadequate. If your only contaminants of concern in a 100' by 100' investigation along Industrial Way are arsenic and lead, then you missed all the chromium, propylene glycol, epoxies and resins, spent break fluid, and solvents the car and cabinet shops along Industrial Way have poured into the "ditches" and ground for years.

I have personally observed them draining radiators and dumping other cleaning fluids onto the ground. In thirty years, to have not adequately studied this area is an outrage. Yes the buildings have to come down first, but you have let the current workers work in an unsafe environment. You also have to test for the right chemicals, based an exhaustive historical business search, the Data Gap is a little meager. What chemicals may be present around the Bayshore Sanitary District office?

There are reasons for chrome VI near the Stauffer Chemical building, but somehow it isn't in a quantity to be a chemical of concern? The tanneries' acid and aniline dye pits were previously

noted chemicals of concern. Have the MCL's changed? It would be good to isolate that area with targeted testing and remediation, just to be safe. Chrome VI doesn't work well in any species' developmental stages.

When the 250 and 350 Industrial Way buildings were razed, there were reports of the Ph in the soil being acidic and the soil being warm, indicating a chemical reaction under ground. These test observations are not disclosed in the Data Gap Investigation report. It would be beneficial to know Ph and temperature if your casons or VOC sheeting under your future buildings will disintegrate because of the Ph in the soil below. Ph is not a chemical of concern per se, but should be tested.

It is unclear whether you will go down the full 50 feet to Young Bay Mud and remove the entire Bunker-C pox (future sand boil), or whether you will smear parts of it around to non-detect, or use the smolder-in-place technique for the entire wad. Please clarify.

I object to the burning of Bunker-C in place. Brisbane does not allow new toxic burners and has no designation for chemical production facilities. It's a slippery slope. Have you considered the air quality impacts of burning Bunker-C relative to rail or truck transportation off-site to a qualified site? Have you considered the safety considerations of burning fuel near Kinder Morgan Tank Farm? Do you require any setbacks for the waste by-product that gets repatriated into the morass? The by-product should be encased properly or shipped off site. We are not a hazardous waste dump.

What about the sensitive receptors up wind, on the Ridge? Will they be informed of the burning schedules? How many other urban communities have experienced this technique? What is their experience? What are the pros and cons of this proposed remediation? Would mycelium remediation be a more gentle technique? There is insufficient information in this document for the public to make an informed decision. We need a full discussion of alternatives.

Do not create a matrix of small hazardous waste sites under future streets or buildings. Who wants that in their neighborhood? The toxins will still co-mingle with groundwater and other chemicals, both present and unknown, untested other dangers, like acids or radioactive substances.

You mention the City's representative "EKI" being in the stakeholder meetings. Was the city's independent remediation consultant, Dr. G. Fred Lee also present? The Brisbane City council promised his guidance and comments. We would greatly appreciate his input.

Sloppy job. No groundwater samples for 15 years? So much for continuity and detecting patterns and movement of chemicals of concern. There is also an intentional omission of the discussion of the VOC's near Kinder Morgan or their in-situ wetland remediation method for their past fuel spills at the southern end of OU2. There's a direct environmental impact, totally omitted. This omission makes this feasibility study insufficient.

There is little mention of the South Disposal fill area and that earlier assumptions, RAO's, and maximum contaminant levels have changed over time. It doesn't mention our inadequate chemical statutes as compared to Eu's REACH or better standards. None of the earlier Superfund listing criteria studies considered housing as a viable use, hence "no target audience." A lot has changed, even how we view housing and work needs due to the pandemic.

It's not clear what the threshold for removal is. MW-4A had detections of metals including arsenic, barium, chromium, copper, lead, and zinc… and "Antimony, arsenic, barium,

cadmium, chromium, cobalt, copper, lead, molybdenum, nickel, selenium, and zinc were detected in at least one of the two groundwater monitoring wells at relatively low concentrations;..." (FS/RAP pg 18) - What level of cleanup will happen there? None because they are relatively low, or aggressive removal because of cumulative contaminants of concern? That criteria should be clear and stated often, not found buried in an appendix.

This document and the future RDIP needs to be conclusive, not piecemealed, not left up to chance, not allowed to leave the harder, more toxic parts 'til last. You should not allow a "staging" of the remediations. It will put workers, travelers, and new residents at risk. Please note that the environmentally preferred alternative would be to do a complete comprehensive clean up.

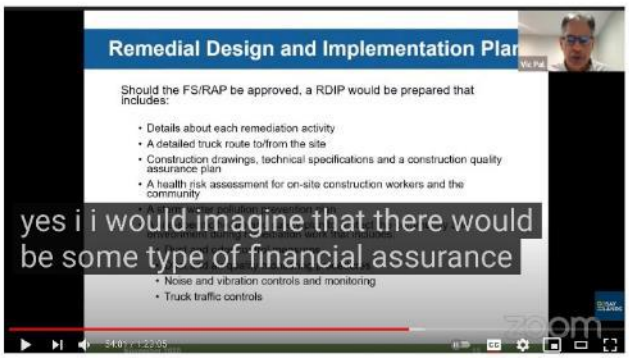
Being "exempt from beneficial use" (FS/RAP pg 28) for water, does not mean that you allow the toxic chemicals to migrate off site or are exempt from efforts to reduce the contamination, it merely means the end product won't be used or consumed. Mitigations to reduce the impact should be still attempted. Every effort to not penetrate into the lower aquifer, should be paramount.

While some of these toxins are "statistically insignificant," you fail to speak to the cumulative effect if two or more "statistically insignificant" products, even at a low doses, will impact your health. The Zone 5 area with concentrated organochlorine pesticides also had chromium concentrations. What level is that cleaned up to? That's why it should all go.

You have to consider public acceptance. We don't want a variety of clean up levels or ineffective, unproven, further-polluting techniques. Clean it ALL up to drinking water standards. That was DTSC's promise based on the Clean Water Act of 1972. We are waiting.

We're looking for guidance, direction from the Waterboard, not a "I don't know", "maybe", or "I assure you we're up to speed." (Vic Pal 35:21) This FS/RAP does not bring confidence to many members of the public. Additional information is needed on Industrial Way before you can define the remediation techniques.

Since he asked, tell Howard Pearce why there is no housing allowed on the southern part of the rail yard. It is a Public Health Risk. It is the lowest sump in the area. It has the most dense mix of toxic chemicals, many of which he proposes to ignore or leave in place. There is an industrial Petroleum Tank Farm adjacent to the property. You need to evacuate for a minimum of 1 mile during accidental leaks or fires. Kinder Morgan burns their excess fuel, soot pours into the air. It contains all the nasties of BTEX and any heavy metal that has hung in the refining process. It is a Public Health Risk. Please tell Howard it is a Public Health Risk.



I hereby incorporate by reference earlier documents, photos, submissions from 1989 to the present on Schlage Lock, Railyard, Kinder Morgan Spill hearings, and environmental presentations.

APPENDIX I
Statement of Reasons and Preliminary Non-Binding Allocations of Responsibility

Statement of Reasons and Preliminary Non-Binding Allocation of Responsibility

Pursuant to California Health and Safety Code Section 25356.1(e), the California Environmental Protection Agency, the California Regional Water Control Board, San Francisco Bay Region (RWQCB) has prepared this Statement of Reasons as part of the Remedial Action Plan (RAP) for the Brisbane Baylands Operable Unit 2 located in Brisbane, San Mateo County, California, also referred to in this document as OU-2 or the Site.

California Health and Safety Code Section 25356.1(d) outlines six additional criteria that need to be addressed for the recommended remedial alternative. As these criteria are addressed within the nine U.S. EPA criteria, a separate analysis has not been conducted. The analysis required under the Health and Safety Code is included within the Feasibility Study/Remedial Action Plan at Section 6.

Preliminary Non-Binding Allocation of Responsibility

Health and Safety Code (HSC) section 25356.1(e) requires the California Regional Water Control Board, San Francisco Bay Region (RWQCB) to prepare a preliminary nonbinding allocation of responsibility ("NBAR") among all identifiable potentially responsible parties (PRPs), including those parties which may have been released, or may otherwise be immune, from liability pursuant to Chapter 6.8 of the Health and Safety Code or any other provision of law. A NBAR, which is based on the evidence available to the RWQCB, is not binding on anyone, including PRPs and RWQCB.[1]

Southern Pacific Transportation Company (SPTC) acquired the land which would later become the Bayshore Railyard in 1896. SPTC operated the former Bayshore Railyard which was used as a railroad switching yard from 1911 through 1982. Railcar maintenance and repair activities, railcar parking, and material transfer operations were also conducted at the railyard. Chemicals that may have been used or generated as waste at these facilities within OU-2 include metals, volatile organic compounds (VOCs), semi-volatile organic compounds, polychlorinated biphenyls, and petroleum hydrocarbons, including gasoline-range hydrocarbons, diesel-range hydrocarbons, and

[1] One purpose of the NBAR was to establish which PRPs will have an aggregate allocation in excess of 50% and therefore convene arbitration if they so choose, even though the NBAR is otherwise not binding on anyone, including PRPs, RWQCB, or the arbitration panel. However, the arbitration provisions of Chapter 6.8 of Division 20 of the California Health and Safety Code (California Health and Safety Code Sections 25356.2 through 25356.10) were repealed by Senate Bill 1018 (Stats 2012, Chap 39), effective June 27, 2012. Accordingly, all statutory provisions and procedures associated with the arbitration proceeding were repealed.

polynuclear aromatic hydrocarbons. It is also believed that pesticides containing lead and arsenic were sprayed at the railyard for weed control during that period.

SPTC ceased major railyard operations at the Bayshore Railyard in 1982 and the land was unused after 1982. Tuntex USA, Inc. (currently known as Sunquest Properties, Inc., a California corporation and a wholly-owned subsidiary of UPC) (Sunquest) acquired most of the land from SPTC in December 1989 after most railyard facilities had been abandoned and removed. Only the former tank and boiler shop, remnants of the Roundhouse, and various foundations and building slab outlines remain. Sunquest has not operated any manufacturing activities at OU-2 since acquiring the property, and no disposal of hazardous chemicals to land or water is known to have occurred during its ownership.

In December 1985, the Department of Health Services (DHS), predecessor to the California Department of Toxic Substances (DTSC) and RWQCB, issued an Order to Post and Fence to SPTC for the Bayshore Railyard. The order noted that there had been a release of a hazardous substance on, under, or into the land on the Bayshore Railyard and that the release did not comply with the terms of a current permit or Interim Status Document or regulation of DHS. The order required SPTC to enclose the entire contaminated area with fencing and to post signs warning of the presence of a hazardous substance.

In December 1988, DHS issued a Remedial Action Order (1988 Order) to SPTC for the Bayshore Railyard. The 1988 Order noted that soil and shallow groundwater at the Bayshore Railyard was contaminated with arsenic, barium, chromium, copper, lead, zinc, oil, benzene, trichloroethane, trichlorethylene, dichloroethylene, and vinyl chloride (i.e., metals, petroleum and petroleum related constituents and VOCs). The 1988 Order required the following: a groundwater monitoring program; a remedial investigation data study report to determine the nature and full extent of contamination at the Bayshore Railyard; a community relations plan; a feasibility study workplan and report; a remedial action plan; a remedial design and implementation plan; and operation and maintenance activities, if needed. SPTC submitted to DHS the following for review and approval: a groundwater monitoring program, a remedial investigation data study report, a supplemental remedial investigation sampling plan; and a community relations plan.

In February 1990, DHS issued an Imminent and/or Substantial Endangerment Order and Remedial Action Order (IS&E Order) to SPTC; Tuntex Properties, Inc. (currently also known as Sunquest) (Tuntex); and Oyster Point Properties, Inc. (Oyster Point). The IS&E Order stated that Tuntex and Oyster Point were the current owners and SPTC was the former owner of the Bayshore Railyard. The IS&E Order required the following: continuation of the groundwater monitoring program approved by DHS; a supplemental remedial investigation data study report; a feasibility study workplan; a feasibility study report; a remedial action plan; a remedial design and implementation plan; and operation and maintenance activities if needed. SPTC submitted a feasibility study

report, a remedial action plan, a remedial design and implementation plan, and a removal action completion report between 1992 and 1994 to DTSC.

DTSC amended the IS&E Order in February 1995 which divided Bayshore Railyard into two operable units (OUs): OU-1 (the Bayshore Railyard North Area), and OU-2 (the Bayshore Railyard South Area). As such, the feasibility study, remedial action plan, remedial design and implementation plan, as well as operation and maintenance plans would need to be prepared and implemented separately for each OU. In July 1995, DTSC referred lead agency authority for OU-2 to the RWQCB. DTSC amended the IS&E Order in August 1995 to remove OU-2 from the order. In July 1995, RWQCB accepted lead agency status for OU-2.

Sunquest is a responsible party or a liable person as defined in Health and Safety Code section 25323.5 by virtue of having acquired title to OU-2 on December 28, 1989 under the name Tuntex. SPTC is a responsible party or a liable person as defined in Health and Safety Code section 25323.5 by virtue of having owned and operated the Rail Yard at the time of disposal.

RWQCB sets forth the following preliminary nonbinding allocation of responsibility for OU-2:

Sunquest currently owns OU-2 and has owned OU-2 since December 28, 1989 (approximately 30 years), and was not the owner at the time of disposal. Therefore, this NBAR allocates 25% responsibility to Sunquest.

SPTC owned OU-2 from approximately 1896 to 1989 (approximately 93 years) and operated at OU-2 from approximately 1907 to 1982 (approximately 75 years). During this time hazardous substances were disposed of at OU-2. Union Pacific Corporation acquired SPTC in September 1996. Therefore, this NBAR allocates 75% responsibility to Union Pacific Corporation.