Thienes Engineering, Inc.
CIVIL ENGINEERING • LAND SURVEYING

LOW IMPACT DEVELOPMENT (LID)

FOR

RAILROAD STREET INDUSTRIAL BUILDING
17969 RAILROAD STREET
CITY OF INDUSTRY, CA 91748
APNs: 8264-009-022 AND 8264-009-023

PREPARED FOR:
17969 RAILROAD ST OWNER, LLC c/o ROCKPOINT
3953 MAPLE AVENUE, SUITE 300
DALLAS, TX 75219
PHONE: (972) 934-0100
CONTACT: RON J. HOYL

JANUARY 24, 2024

JOB NO. 4186

PREPARED BY:
THIENES ENGINEERING
14349 FIRESTONE BOULEVARD
LA MIRADA, CALIFORNIA 90638
PHONE: (714) 521-4811
FAX: (714) 521-4173
CONTACT: LUIS PRADO (luisp@thieneseng.com)

LOW IMPACT DEVELOPMENT (LID)

FOR

“RAILROAD STREET INDUSTRIAL BUILDING”

PREPARED BY LUIS PRADO
UNDER THE SUPERVISION OF:

1/24/2024

REINHARD STENZEL DATE
R.C.E. 56155
EXP. 12/31/2024

Owner's Certification

This Low Impact Development (LID) has been prepared for **17969 Railroad St Owner, LLC c/o Rockpoint** (Owner) by **Thienes Engineering, Inc** (Engineers).

The LID is intended to comply with the requirements of the City of Industry requiring the preparation of a LID. The undersigned is aware that Best Management Practices (BMPs) are enforceable pursuant to the City's Municipal Code **Chapter 13.16.090** for Stormwater Management. The undersigned, while it owns the subject property, is responsible for the implementation of the provisions of this plan and will ensure that this plan is amended as appropriate to reflect up-to date conditions1 on the site consistent with the Los Angeles Regional Board's Basin Plan and the intent of the non-point source National Pollutant Discharge Elimination System (NPDES) Permit for Waste Discharge Requirements for the County of Los Angeles, Los Angeles County Flood Control District and the incorporated cities of Los Angeles County within the California Regional Water Quality Control Board, Los Angeles Region. Once the undersigned transfers its interest in the property, its successors-in-interest shall bear the aforementioned responsibility to implement and amend the LID. An appropriate number of approved-signed copies of this document shall be available on the subject site in perpetuity.

Owner Name: 17969 Railroad St Owner, LLC c/o Rockpoint		
Name, Title	Ron J. Hoyl, Vice President	
Company	17969 Railroad St Owner, LLC c/o Rockpoint	
Address	3953 Maple Avenue, Suite 300, Dallas, TX 75219	
Email	ron@rockpoint.com	
Telephone #	(972) 934-0100	
Signature	**Date**	

TABLE OF CONTENTS

APPENDICES

Appendix A Stormwater Quality Design Calculations
Appendix B LID Site Plan
Appendix C BMP Operation and Maintenance
Appendix D Maintenance and Covenant Agreement
Appendix E Educational Materials
Appendix F Infiltration Feasibility

1.0 Project Description

The project site is located at 17969 Railroad Street in the City of Industry (Figure 1.1 - Vicinity Map), at APNs: 8264-009-022 and 8264-009-023 of Los Angeles County.

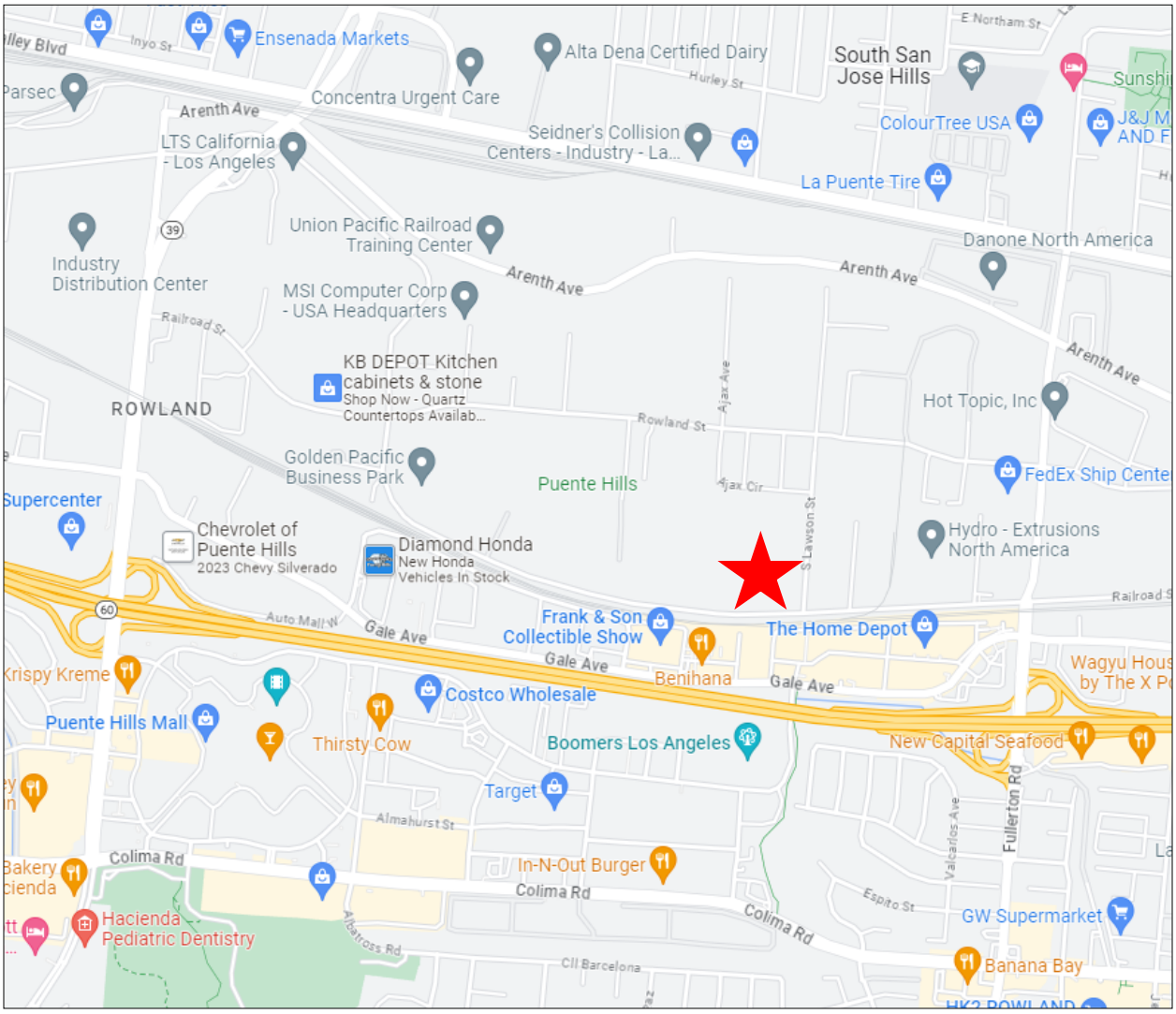


Figure 1.1 - Vicinity Map (north ↑)

The project site encompasses approximately 9.80 acres, of which 9.75 acres will receive LID treatment. The remaining 0.05 acres (Subarea 1B) along Lawson Street, consisting of driveway area and an ADA ramp to the building, drains offsite without being routed to the LID BMP. Proposed improvements include a single warehouse building with loading docks located along its west side. Vehicular parking areas and landscaping areas will be located throughout the site.

The project will treat stormwater runoff generated by the project through the use of a WetlandMOD biofiltration system and an underground detention system sized to treat 1.5 times the Stormwater Quality Design volume (SWQDv). The 1.5x SWQDv is achieved by multiplying

the volume produced by the 85th percentile rainfall depth by 1.5 times. Refer to Appendix A for references and calculations.

1.1 Existing Site Description

The site is currently developed with one existing building (occupied by Reuland Electric Company) and vehicle parking. The site generally drains northwesterly towards San Jose Creek, Reach 1.

1.2 Proposed Site Description

The site will continue to generally drain northwesterly towards the existing single 11'(W)x13'(H) RCB (MTD 1373) at the northwesterly corner of the site.

Surface runoff from the landscaped area fronting Lawson Street (Subarea 15A) will be conveyed northerly via a v-gutter. A proposed area drain will capture runoff and then be conveyed to the adjacent proposed storm drain system.

Roof runoff from the easterly portion of the building (Subareas 1A-4A and 10A-12A) will flow through multiple roof drains and connect to two separate storm drain systems, with one flowing north and the other south.

Surface runoff from the southerly and northerly vehicular parking lots (Subareas 5A, 6A, 13A and 14A) will be collected via proposed catch basins.

Surface runoff the loading dock area and the westerly vehicle parking lots, including roof runoff from the westerly portion of the building (Subareas 7A-8A), will be collected via proposed catch basins located in the loading dock area.

Two separate storm drain systems located east of the building along Lawson Street (with one flowing north and the other south) will wrap around the building and confluence at the northwesterly corner of the site. Runoff from Subareas 10A-12A and 14A will be conveyed by the northerly storm drain. Runoff from Subareas 1A-9A will be conveyed by the southerly storm drain. After confluencing, runoff from Subarea 13A will connect to the storm drain system. All runoff will then discharge offsite into the existing 11'(W)x13'(H) RCB (MTD 1373) storm drain system.

The 1.5x SWQDv will be diverted via diversion structures (located at the northwesterly corner of site) to a hydrodynamic separator for pretreatment and then to underground chambers and a WetlandMOD biofiltration system for primary treatment. From the chambers, the SWQDv will be pumped into the above-grade WetlandMOD biofiltration system that utilizes the MS4 Permit's Attachment H soils and plants for treatment. The pump is designed to pump a low flowrate that is equal to or slightly greater than the WetlandMOD's treatment flowrate. This flowrate is intended to drain/treat the 1.5x SWQDv within the allotted 96 hours. Pumped flows exceeding the WetlandMOD's treatment flowrate will overflow into a return pipe and outlet back

into the upstream pump's wet well. Since the pump's flowrate is small, stormwater is designed/expected to back-up and fill the detention chambers. Once the chambers are full, it is understood that the 1.5x SWQDv has been achieved and stormwater will again back-up and overflow back into the main storm drain line to outlet the site. After the storm event has passed, no additional flows will enter the chambers and the chambers will slowly deplete as stormwater is being pumped through the WetlandMOD for treatment over 96 hours. Treated flows will discharge offsite via the main storm drain line. See Appendix A for detailed calculations.

1.3 Geological Investigation

2016 Groundwater Monitoring and Sampling Report by Dudek dated April 20, 2016
A total of twelve (12) groundwater monitoring wells are located at the subject site. The Los Angeles Regional Water Quality Control Board (LARWQCB) has requested ongoing groundwater sampling for volatile compounds due to the previous activities conducted by Rueland Electric Company.

A sample of this report is available in Appendix F of this LID report. Due to the ongoing investigation by LARWQCB, the previous soil contamination, and the past use of the site, infiltration is not recommended.

Storm Water Infiltration Letter by Southern California Geotechnical dated June 12, 2023
The geotechnical investigation found soil conditions that are not suitable for storm water infiltration. The fill soils at the site have very poor infiltration characteristics and have been heavily disturbed, further reducing their potential infiltration rates. In addition, the site is located within a liquefaction hazard zone, and the use of storm water infiltration could increase the potential for, and magnitude of, liquefaction-induced settlements. Therefore, storm water infiltration is not considered feasible and is not recommended for this project.

This letter can be found in Appendix F of this LID report.

2.0 Project Specific Requirements

The project is a redevelopment project that results in replacement of 5,000 square feet or more of impervious surface area. The project will alter more than 50 percent of the impervious surface thus the entire development site must meet the requirements of the LID Standards Manual (February 2014).

2.1 Peak Storm Water Runoff Discharge Rates / HCOC

Post-development peak stormwater runoff discharge rates shall not exceed the estimated pre-development rate for developments where the increased peak stormwater discharge rate will result in increased potential for downstream erosion.

The proposed project will not create any new hydrologic conditions of concerns. Runoff from the property will continue to drain to San Jose Creek, an engineered, hardened, and maintained channel. The downstream receiving water (such as San Gabriel River) are also engineered, hardened and maintained and are not susceptible to hydromodification impacts. Discharge from the project will be in full compliance with agency requirements for connections and discharges to the MS4, including both quality and quantity requirements.

2.2 Conserve Natural Areas

During the subdivision design and approval process, the site layout must be consistent with the applicable General Plan and Local Area Plan policies and implement the following:

- *Concentrate or cluster development on portions of the site while leaving the remaining land in a natural undisturbed condition;*
- *Limit clearing and grading of native vegetation at the site to the minimum amount needed to build lots, allow access, and provide fire protection;*
- *Maximize trees and other vegetation at the site by planting additional vegetation, clustering tree areas, and promoting the use of native and/or drought tolerant plants;*
- *Promote natural vegetation by using parking lot islands and other landscaped areas;*
- *Preserve riparian areas and wetlands.*

The project site is currently developed with no natural areas to conserve.

2.3 Minimize Storm Water Pollutants of Concern

Stormwater runoff from a site has the potential to contribute oil and grease, suspended solids, metals, gasoline, pesticides, and pathogens to the stormwater conveyance system. The development must be designed so as to minimize, to the maximum extent practicable, the introduction of pollutants of concern that may result in significant impacts, generated from site runoff of directly connected impervious areas (DCIA), to the stormwater conveyance system as approved by the building official. Pollutants of concern, consist of any pollutants that exhibit

one or more of the following characteristics: current loadings or historic deposits of the pollutant are impacting the beneficial uses of a receiving water, elevated levels of the pollutant are found in sediments of a receiving water and/or have the potential to bioaccumulate in organisms therein, or the detectable inputs of the pollutant are at concentrations or loads considered potentially toxic to humans and/or flora and fauna.

In meeting this specific requirement, "minimization of the pollutants of concern" will require the incorporation of a BMP or combination of BMPs best suited to maximize the reduction of pollutant loadings in that runoff to the Maximum Extent Practicable.

Anticipated pollutants generated from the proposed development are:

- Heavy Metals
- Nutrients
- Pesticides
- Organic Compounds
- Sediments
- Trash & Debris
- Oxygen Demanding Substances
- Oil and Grease

The receiving waters and their impairments are:

- San Jose Creek (Reach 1): Ammonia, Indicator Bacteria, pH, Total Dissolved Solids, Toxicity
- San Gabriel River (Reach 3): Indicator Bacteria
- San Gabriel River (Reach 2): Cyanide, Lead, Temperature (water)
- San Gabriel River (Reach 1): pH, Temperature (water)
- San Gabriel River Estuary: Copper, Dioxin, Indicator Bacteria, Nickel, Oxygen (dissolved)
- San Pedro Bay Near/Off Shore Zones: Chlordane, PCBs (Polychlorinatedbiphenyls), Total DDT, Toxicity
- Pacific Ocean: None

The pollutants of concern (pollutants anticipated to be generated by the development and listed as impairments in the receiving waters) of the project site are:

- Heavy Metals
- Trash and debris

The proposed project will disconnect runoff from impervious areas by means of WetlandMOD biofiltration system and an underground detention system. Inlets are used to intercept "low flows" towards the biofiltration systems for treatment prior to discharging offsite.

2.4 Routine Non-Structural BMPs

Routine Non-Structural BMPs	
Name	**Describe BMP Implementation OR, if not applicable, state reason**
Education of Property Owners, Tenants and Occupants on Stormwater BMPs	Property owner will familiarize him/herself with the educational materials in Appendix E and the contents of the LID.
Activity Restrictions	No outdoor work areas, processing, storage or wash area. Activities are restricted to only those for which a BMP has been implemented.
Landscape Management BMPs	Irrigation must be consistent with City's Water Conservation Ordinance. Fertilizer and pesticide usage will be consistent with County Management Guidelines for Use of Fertilizers and Pesticides.
BMP Maintenance	BMP maintenance, implementation schedules, and responsible parties are included in Appendix C.
Title 22 CCR Compliance	Not applicable at the time of preparation of this LID as the project consists of an empty shell building. The LID is to be amended and shall comply with Title 22 CCR, as applicable to the business.
Spill Contingency Plan	Owner/tenant will have a spill contingency plan based on individual site needs.
Underground Storage Tank Compliance	Not applicable.
Hazardous Materials Disclosure Compliance	Site will be in compliance with ordinances typically enforced by respective fire protection agency for the management of hazardous materials. Los Angeles County, health care agencies, and/or other appropriate agencies (i.e. Department of Toxics Substances Control is typically responsible for enforcing hazardous materials and hazardous waste handling and disposal regulations.
Uniform Fire Code Implementation	Site will be in compliance with article 80 of the Uniform Fire Code enforced by fire protection agency. Inspection and maintenance as necessary.
Litter/Debris Control Program	Contract with their landscape maintenance firm to provide this service during regularly schedule maintenance (weekly).
Employee Training	The owner will ensure that tenants are also familiar with onsite BMPs and necessary maintenance required of the tenants. Owner will check with City and County at least once a year to obtain new or updated educational materials and provide these materials to tenants. Employees shall be trained to clean up spills and participate in ongoing maintenance. This LID requires bi-annually employee training and new hires within 2 months.

Routine Non-Structural BMPs	
Name	**Describe BMP Implementation OR, if not applicable, state reason**
Housekeeping of Loading Docks	Keep all fluids indoors. Clean up spills immediately and keep spills from entering storm drain system. No discharges of wastewater or cleanup water from maintenance of loading docks into the storm drain system. Area shall be inspected weekly for proper containment and practices with spills cleaned up immediately and disposed of properly. Areas under "dock high" doors shall be swept daily.
Catch Basin Inspection Program	The owner/maintenance contractor will be responsible for cleaning the catch basins on-site on a regular basis prior to the storm season, no later than October 1st of each year. Catch basins and storm drain system will be cleaned at least twice a year and prior to October 1.
Vacuum Sweeping of Private Streets and Parking Lots	All landscape maintenance contractors will be required to sweep up all landscape cuttings, mowings and fertilizer materials off paved areas weekly and dispose of properly. Parking areas and driveways will be swept monthly by sweeping contractor.
Retail Gasoline Outlets	Not applicable.

2.5 Routine Structural BMPs

Routine Structural BMPs	
Name	**Describe BMP Implementation OR, if not applicable, state reason**
Provide storm drain system stenciling and signage	All proposed and existing inlets to remain will be stenciled with prohibitive language and/or graphical icons to prevent dumping. Legibility of the stencils/markers will be maintained on a yearly basis, or as needed.
Design and construct outdoor material storage areas to reduce pollution introduction	Not applicable. There are no proposed outdoor material storage areas for this project. Any and all materials will be stored indoors.
Design and construct trash and waste storage areas to reduce pollution introduction	Paved with an impervious surface, designed not to allow run-on from adjoining areas, designed to divert drainage from adjoining roofs and pavements diverted around the area, and screened or walled to prevent off-site transport of trash.
Use efficient irrigation systems & landscape design, water conservation, smart controllers, and source control	Irrigation systems shall include reducers or shutoff valves triggered by a pressure drop to control water loss in the event of broken sprinkler heads or lines. Timers will be used to avoid over watering and watering cycles and duration shall be adjusted seasonally by the landscape maintenance contractor.
Protect slopes and channels and provide energy dissipation	Not applicable. The proposed project site is located on a very flat terrain. There are no slopes, natural drainage systems, or channel crossings to protect.
Loading and Unloading Dock Areas	Keep all fluids indoors. Clean up spills immediately and keep spills from entering storm drain system. No discharges of wastewater or cleanup water from maintenance of loading docks into the storm drain system. Area shall be inspected weekly for proper containment and practices with spills cleaned up immediately and disposed of properly. Areas under “dock high” doors shall be swept daily.
Covered maintenance bays with spill containment plans	No maintenance bays onsite.
Vehicle wash areas with spill containment plans	No vehicle wash areas onsite.
Covered outdoor processing areas	No outdoor processing areas onsite.
Equipment wash areas with spill containment plans	No equipment wash areas onsite.
Fueling areas	No fueling areas onsite.
Hillside landscaping	No hillsides onsite.
Wash water control for food preparation areas	No food preparation onsite.
Community car wash racks	No community cars wash racks onsite.

2.6 Site Design BMPs

Site Design BMPs	
Minimize impervious areas: ☒Yes ☐No	Landscaping is proposed throughout the project site to the most extent practicable. Landscaping will help reduce the amount of runoff generated from the site.
Maximize natural infiltration capacity: ☐Yes ☒No	The project site will use biofiltration type BMPs due to poor infiltration at the site.
Preserve existing drainage patterns and time of concentration: ☒Yes ☐No	Post-development drainage patterns will mimic pre-development conditions. The proposed BMPs will also assist in increasing the time of concentration.
Disconnect impervious areas: ☒Yes ☐No	The WetlandMOD biofiltration system and an underground detention system will disconnect impervious areas before discharging offsite.
Protect existing vegetation and sensitive areas: ☐Yes ☒No	Not applicable, there is no sensitive areas to protect. Landscape will be provided throughout the site.
Re-vegetate disturbed areas: ☐Yes ☒No	Not applicable, development consists of a warehouse building. Most of the disturbed areas will be paved; however, all disturbed areas will drain through the WetlandMOD biofiltration system for treatment. Also, landscape will be provided throughout the site.
Utilize vegetated drainage swales in place of underground piping or imperviously lined swales: ☐Yes ☒No	Underground piping and imperviously lined swales could not be substituted with vegetated swales.

2.7 Treatment Control BMPs

The proposed project is required to incorporate appropriate stormwater mitigation measures into the design plan for the entire site. The proposed project will treat and mitigate flows per LID guidelines via a WetlandMOD biofiltration system and an underground detention system.

2.8 Provide Proof of Ongoing BMP Maintenance

Improper maintenance is one of the most common reasons why water quality controls will not function as designed or which may cause the system to fail entirely. It is important to consider who will be responsible for maintenance of a permanent BMP, and what equipment is required to perform the maintenance properly. If Structural or Treatment Control BMPs are required or included in project plans, the applicant must provide verification of maintenance provisions through such means as may be appropriate, including, but not limited to legal agreements, covenants, CEQA mitigation requirements and/or Conditional Use Permits.

The verification will include the developer's signed statement, as part of the project application, accepting responsibility for all Structural and Treatment Control BMP maintenance until the time the property is transferred and, where applicable, a signed agreement from the public entity

assuming responsibility for Structural or Treatment Control BMP maintenance. The transfer of property to a private or public owner must have conditions requiring the recipient to assume responsibility for maintenance of any Structural or Treatment Control BMP to be included in the sales or lease agreement for that property, and will be the owner's responsibility. The condition of transfer shall include a provision that the property owners conduct maintenance inspection of all Structural or Treatment Control BMPs at least once a year and retain proof of inspection. For residential properties where the Structural or Treatment Control BMPs are located within a common area, which will be maintained by a homeowner's association, language regarding the responsibility for maintenance must be included in the project's conditions, covenants and restrictions (CC&Rs). Printed educational materials will be required to accompany the first deed transfer to highlight the existence of the requirement and to provide information on what stormwater management facilities are present, signs that maintenance is needed, how the necessary maintenance can be performed, and assistance that the Permittee can provide. The transfer of this information shall also be required with any subsequent sale of the property.

Structural or Treatment Control BMPs located within a public area proposed for transfer will be the responsibility of the developer until accepted for transfer by the appropriate public agency. Structural or Treatment Control BMPs proposed for transfer must meet design standards adopted by the public entity for the BMP installed and should be approved by the appropriate public agency prior to its installation.

The property owner/operator will maintain proof of ongoing maintenance at the site as recorded in the covenant and agreement (see Appendix D).

2.9 Provisions Applicable to Individual Priority Project Categories

2.9.A Single Family Hillside Home

The project site is not a single family hillside development.

2.9.A.1 Conserve Natural Areas

The project site is not a single family hillside development.

2.9.A.2 Protect Slopes and Channels

The project site is not a single family hillside development.

2.9.A.3 Provide Storm Drain System Stenciling and Signage

The project site is not a single family hillside development.

2.9.A.4 Divert Roof Runoff to Vegetated Areas Before Discharge

The project site is not a single family hillside development.

2.9.A.5 Direct Surface Flow to Vegetated Areas Before Discharge

The project site is not a single family hillside development.

2.9.B 43,560 Square Feet Industrial/Commercial Developments

2.9.B.1 Properly Design Loading/Unloading Dock Areas

Loading/unloading dock areas have the potential for material spills to be quickly transported to the storm water conveyance system. To minimize this potential, the following design criteria are required:

- *Cover loading dock areas or design drainage to minimize run-on and runoff of storm water.*
- *Direct connections to storm drains from depressed loading docks (truck wells) are prohibited.*

The proposed project is designed so that pollutants from the impervious surfaces are disconnected prior to discharging offsite. Runoff from the parking lots is transported through WetlandMODs and underground detention for treatment.

2.9.B.2 Properly Design Repair/Maintenance Bays

Oil and grease, solvents, car battery acid, coolant and gasoline from the repair/maintenance bays can negatively impact storm water if allowed to come into contact with storm water runoff. Therefore, design plans for repair bays must include the following:

- *Repair/maintenance bays must be indoors or designed in such a way that do not allow storm water run-on or contact with storm water runoff.*
- *Design a repair/maintenance bay drainage system to capture all washwater, leaks and spills. Connect drains to a sump for collection and disposal. Direct connection of the repair/maintenance bays to the storm drain system is prohibited. If required by local jurisdiction, obtain an Industrial Waste Discharge Permit.*

Not applicable, the proposed project will not construct any maintenance bays.

2.9.B.3 Properly Design Vehicle/Equipment Wash Areas

The activity of vehicle/equipment washing/steam cleaning has the potential to contribute metals, oil and grease, solvents, phosphates, and suspended solids to the stormwater conveyance system. Project plans are required to designate an area for washing/steam cleaning of vehicles and equipment. This area is required to be:

- *Self-contained and/or covered, equipped with a clarifier, or other pretreatment facility, and properly connected to a sanitary sewer or to a permitted disposal facility.*

Not applicable, the proposed project will not construct any vehicle/equipment wash areas.

2.9.C Restaurants

2.9.C.1 Properly Design Equipment/Accessory Wash Areas

The activity of outdoor equipment/accessory washing/steam cleaning has the potential to contribute metals, oil and grease, solvents, phosphates, and suspended solids to the storm water conveyance system. Include in the project plans an area for the washing/steam cleaning of equipment and accessories. This area must be:

- *Self-contained, equipped with a grease trap, and properly connected to a sanitary sewer.*
- *If the wash area is to be located outdoors, it must be covered, paved, have secondary containment, and be connected to the sanitary sewer.*

The proposed project is not a restaurant.

2.9.D Retail Gasoline Outlets

2.9.D.1 Properly Design Fueling Area

Fueling areas have the potential to contribute oil and grease, solvents, car battery acid, coolant and gasoline to the storm water conveyance system. The project plans must include the following BMPs:

- *The fuel dispensing area must be covered with an overhanging roof structure or canopy. The canopy's minimum dimensions must be equal to or greater than the area within the grade break. The canopy must not drain onto the fuel dispensing area, and the canopy downspouts must be routed to prevent drainage across the fueling area.*
- *The fuel dispensing area must be paved with Portland cement concrete (or equivalent smooth impervious surface), and the use of asphalt concrete shall be prohibited.*
- *The fuel dispensing area must have a 2% to 4% slope to prevent ponding, and must be separated from the rest of the site by a grade break that prevents run-on of storm water to the extent practicable.*

- *At a minimum, the concrete fuel dispensing area must extend 6.5 feet (2.0 meters) from the corner of each fuel dispenser, or the length at which the hose and nozzle assembly may be operated plus 1 foot (0.3 meter), whichever is less.*

The proposed project is not a retail gasoline outlet.

2.9.E Automotive Repair Shops

2.9.E.1 Properly Design Fueling Area

Fueling areas have the potential to contribute oil and grease, solvents, car battery acid, coolant and gasoline to the storm water conveyance system. The project plans must include the following BMPs:

- *The fuel dispensing area must be covered with an overhanging roof structure or canopy. The canopy's minimum dimensions must be equal to or greater than the area within the grade break. The canopy must not drain onto the fuel dispensing area, and the canopy downspouts must be routed to prevent drainage across the fueling area.*
- *The fuel dispensing area must be paved with Portland cement concrete (or equivalent smooth impervious surface), and the use of asphalt concrete shall be prohibited.*
- *The fuel dispensing area must have a 2% to 4% slope to prevent ponding, and must be separated from the rest of the site by a grade break that prevents run-on of storm water to the extent practicable.*
- *At a minimum, the concrete fuel dispensing area must extend 6.5 feet (2.0 meters) from the corner of each fuel dispenser, or the length at which the hose and nozzle assembly may be operated plus 1 foot (0.3 meter), whichever is less.*

Not applicable, no fuel dispensing areas proposed.

2.9.E.2 Properly Design Repair/Maintenance Bays

Oil and grease, solvents, car battery acid, coolant and gasoline from the repair/maintenance bays can negatively impact storm water if allowed to come into contact with storm water runoff. Therefore, design plans for repair bays must include the following:

- *Repair/maintenance bays must be indoors or designed in such a way that doesn't allow storm water run-on or contact with storm water runoff.*
- *Design a repair/maintenance bay drainage system to capture all wash-water, leaks and spills.*
- *Connect drains to a sump for collection and disposal. Direct connection of the repair/maintenance bays to the storm drain system is prohibited. If required by local jurisdiction, obtain an Industrial Waste Discharge Permit.*

Not applicable, the proposed project will not construct any maintenance bays.

2.9.E.3 Properly Design Vehicle/Equipment Wash Areas

The activity of vehicle/equipment washing/steam cleaning has the potential to contribute metals, oil and grease, solvents, phosphates, and suspended solids to the storm water conveyance system. Include in the project plans an area for washing/steam cleaning of vehicles and equipment. This area must be:

- *Self-contained and/or covered, equipped with a clarifier, or other pretreatment facility, and properly connected to a sanitary sewer or to a permitted disposal facility.*

The proposed project is not an automotive repair shop.

2.9.E.4 Properly Design Loading/Unloading Dock Areas

Loading/unloading dock areas have the potential for material spills to be quickly transported to the storm water conveyance system. To minimize this potential, the following design criteria are required:

- *Cover loading dock areas or design drainage to minimize run-on and runoff of storm water.*
- *Direct connections to storm drains from depressed loading docks (truck wells) are prohibited.*

The proposed project is designed so that pollutants from the impervious surfaces are disconnected prior to discharging offsite. Runoff from the parking lots is transported through WetlandMODs and underground detention for treatment.

2.9.F Parking Lots

2.10.F.1 Properly Design Parking Area

Parking lots contain pollutants such as heavy metals, oil and grease, and polycyclic aromatic hydrocarbons that are deposited on parking lot surfaces by motor-vehicles. These pollutants are directly transported to surface waters. To minimize the offsite transport of pollutants, the following design criteria are required:

- *Reduce impervious land coverage of parking areas.*
- *Infiltrate runoff before it reaches storm drain system.*
- *Treat runoff before it reaches storm drain system.*

The proposed project is designed so that pollutants from the impervious surfaces are disconnected prior to discharging offsite. Runoff from the parking lots is transported through WetlandMODs and underground detention for treatment.

2.10.F.2 Properly Design to Limit Oil Contamination and Perform Maintenance

Parking lots may accumulate oil, grease, and water insoluble hydrocarbons from vehicle drippings and engine system leaks.

- *Treat to remove oil and petroleum hydrocarbons at parking lots that are heavily used (e.g. fast food outlets, lots with 25 or more parking spaces, sports event parking lots, shopping malls, grocery stores, discount warehouse stores).*
- *Ensure adequate operation and maintenance of treatment systems particularly sludge and oil removal, and system fouling and plugging prevention control.*

The project owner will ensure that grease and oil are contained. The parking lot will be swept on a monthly basis, minimum, and before any rain events. Absorbent materials will be used to collect any spilled oil, and disposed of properly, to ensure they do not contaminate stormwater. Runoff from the parking lots are transported through a WetlandMOD biofiltration system for treatment.

2.10 Waiver

A Permittee may, through adoption of an ordinance or code incorporating the treatment requirements of the LID, provide for a waiver from the requirement if impracticability for a specific property can be established. A waiver of impracticability shall be granted only when all other Structural or Treatment Control BMPs have been considered and rejected as infeasible. Recognized situations of impracticability include, (i) extreme limitations of space for treatment on a redevelopment project, (ii) unfavorable or unstable soil conditions at a site to attempt infiltration, and (iii) risk of ground water contamination because a known unconfined aquifer lies beneath the land surface or an existing or potential underground source of drinking water is less than 10 feet from the soil surface. Any other justification for impracticability must be separately petitioned by the Permittee and submitted to the Regional Board for consideration. The Regional Board may consider approval of the waiver justification or may delegate the authority to approve a class of waiver justifications to the Regional Board Executive Officer. The supplementary waiver justification becomes recognized and effective only after approval by the Regional Board or the Regional Board Executive Officer. A waiver granted by a Permittee to any development or redevelopment project may be revoked by the Regional Board Executive Officer for cause and with proper notice upon petition.

The proposed project does not require a waiver of impracticability from any LID conditions.

2.11 Mitigation Funding

The Permittees may propose a management framework, for endorsement by the Regional Board Executive Officer, to support regional or sub-regional solutions to storm water pollution, where any of the following situations occur:

- *A waiver for impracticability is granted;*
- *Legislative funds become available;*
- *Off-site mitigation is required because of loss of environmental habitat; or*
- *An approved watershed management plan or a regional storm water mitigation plan exists that incorporates an equivalent or improved strategy for storm water mitigation.*

No management framework for mitigation funding is necessary for the proposed project.

Funding will be the responsibility of the owner:

17969 RAILROAD ST OWNER, LLC c/p ROCKPOINT
3953 MAPLE AVENUE, SUITE 300
DALLAS, TX 75219
PHONE: (972) 934-0100
CONTACT: RON J. HOYL

2.12 Limitation on Use of Infiltration BMPs

Three factors significantly influence the potential for storm water to contaminate ground water. They are (i) pollutant mobility, (ii) pollutant abundance in storm water, (iii) and soluble fraction of pollutant. The risk of contamination of groundwater may be reduced by pretreatment of storm water. A discussion of limitations and guidance for infiltration practices is contained in, Potential Groundwater Contamination from Intentional and Non-Intentional Stormwater Infiltration, Report No. EPA/600/R-94/051, USEPA (1994).

In addition, the distance of the groundwater table from the infiltration BMP may also be a factor determining the risk of contamination. A water table distance separation of ten feet depth in California presumptively poses negligible risk for storm water not associated with industrial activity or high vehicular traffic.

Infiltration BMPs are not recommended for areas of industrial activity or areas subject to high vehicular traffic (25,000 or greater average daily traffic (ADT) on main roadway or 15,000 or more ADT on any intersecting roadway) unless appropriate pretreatment is provided to ensure groundwater is protected and the infiltration BMP is not rendered ineffective by overload.

There is a limitation on the use of infiltration BMPs as previously discussed in Section 1.3. Biofiltration type BMPs have been proposed instead due to the poor infiltration rates.

2.13 Alternative Certification for Storm Water Treatment Mitigation

In lieu of conducting detailed BMP review to verify Structural or Treatment Control BMPs adequacy, a Permittee may elect to accept a signed certification from a Civil Engineer or a Licensed Architect registered in the State of California, that the plan meets the criteria established herein. The Permittee is encouraged to verify that certifying person(s) have been trained on BMP design for water quality, not more than two years prior to the signature date. Training conducted by an organization with storm water BMP design expertise (e.g., a University, American Society of Civil Engineers, American Society of Landscape Architects, American Public Works Association, or the California Water Environment Association) may be considered qualifying.

A California licensed civil engineer has provided a detailed BMP review of this report.

2.14 Resources and Reference

California Storm Water Best Management Practices Handbooks for Construction Activity (2015), Municipal (2003), and Industrial/Commercial (2014).

APPENDIX A

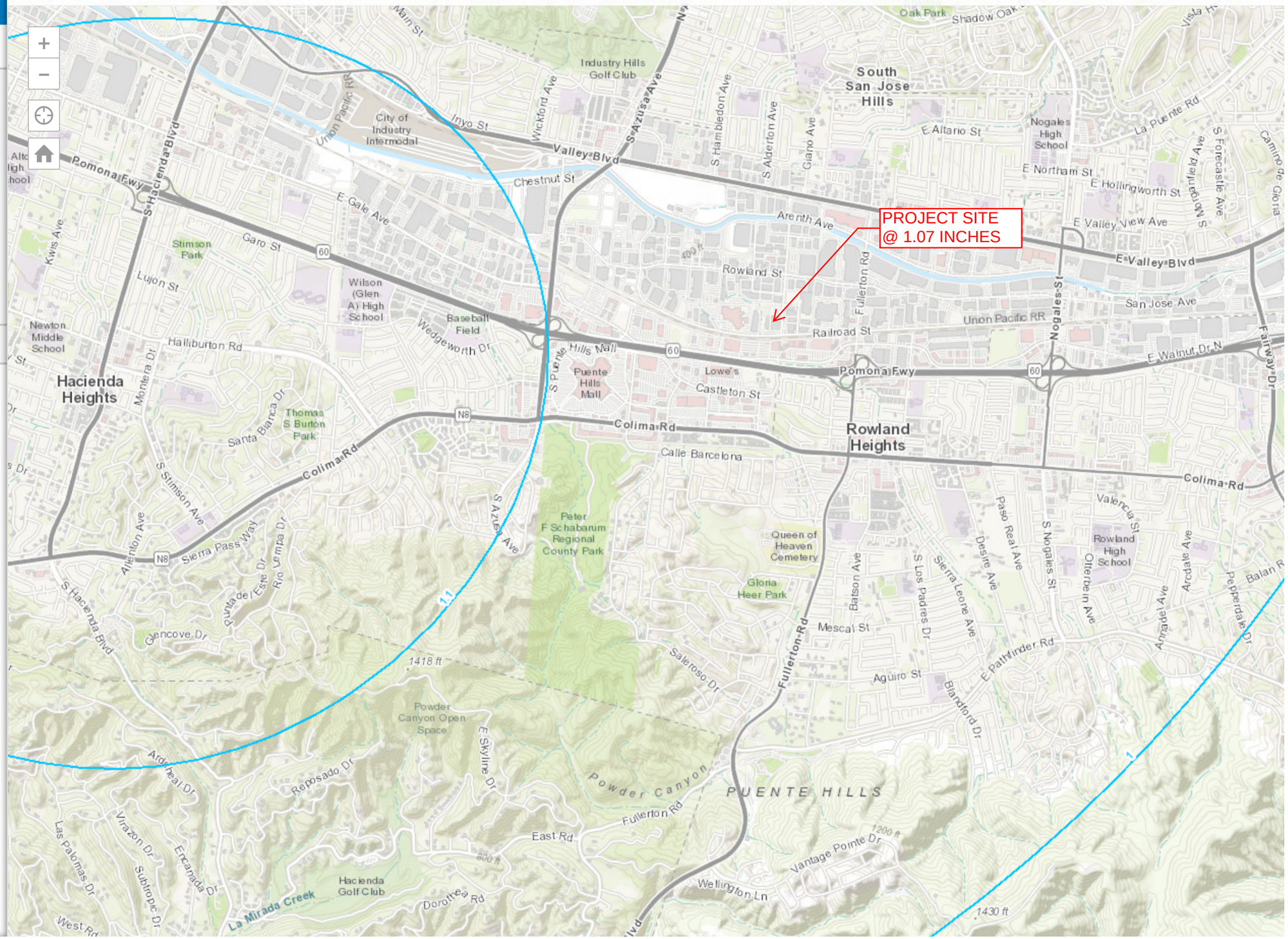
Stormwater Quality Design Calculations

About | Legend | Layers

Layers

- [x] Hydrology GIS
  - [ ] 50yr Two Tenths (Rainfall)
  - [ ] DPA Zones
  - [ ] Soils 2004
  - [x] Final 85th Percentile, 24-hr Rainfall
  - [ ] 1-year, 1-hour Rainfall Intensity
  - [ ] Final 95th Percentile, 24-hr Rainfall
- [x] LA County Parcels

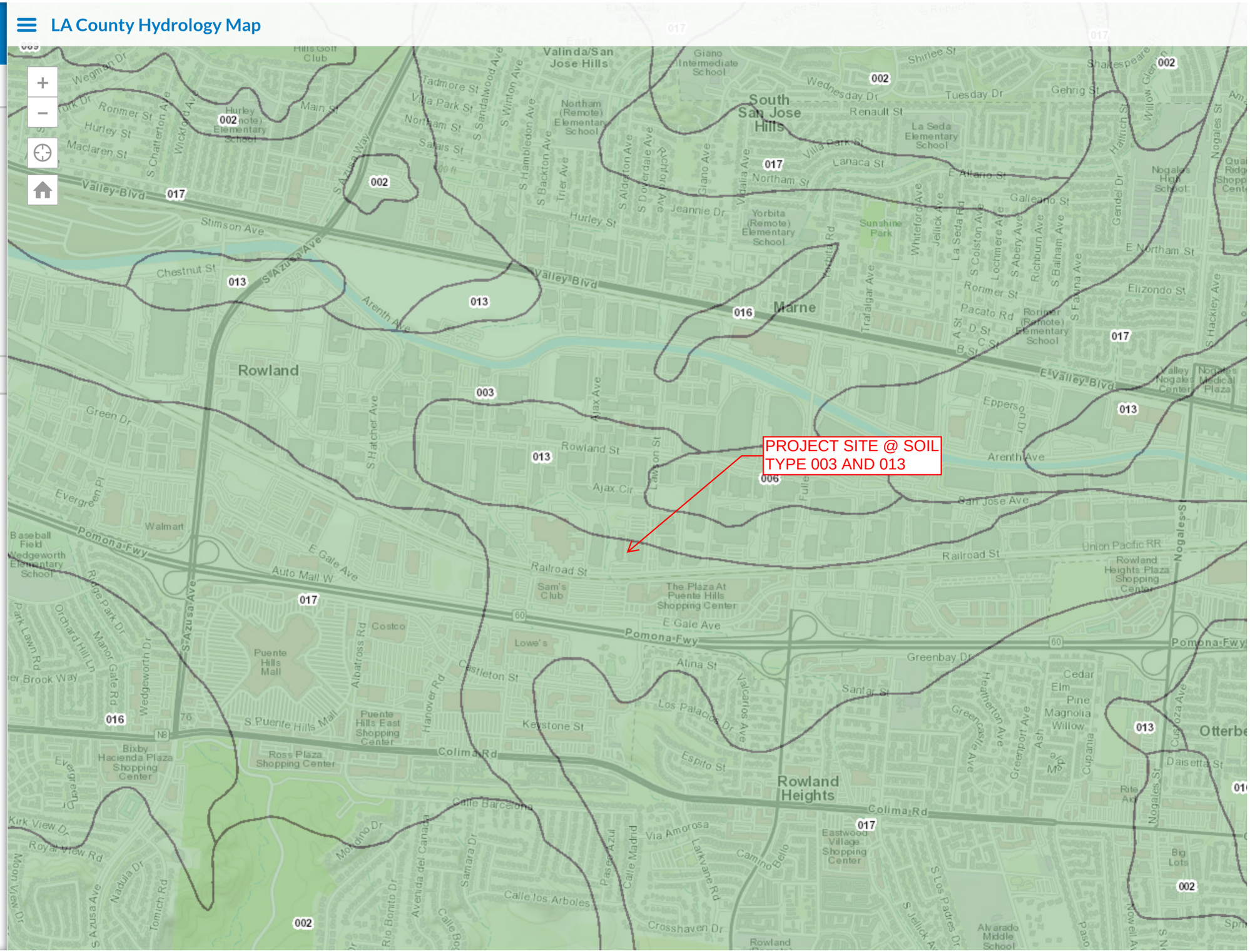
LA County Hydrology Map



About | Legend | Layers

Layers

- [x] Hydrology GIS
  - [ ] 50yr Two Tenths (Rainfall)
  - [ ] DPA Zones
  - [x] Soils 2004
  - [ ] Final 85th Percentile, 24-hr Rainfall
  - [ ] 1-year, 1-hour Rainfall Intensity
  - [ ] Final 95th Percentile, 24-hr Rainfall
- [x] LA County Parcels



Peak Flow Hydrologic Analysis

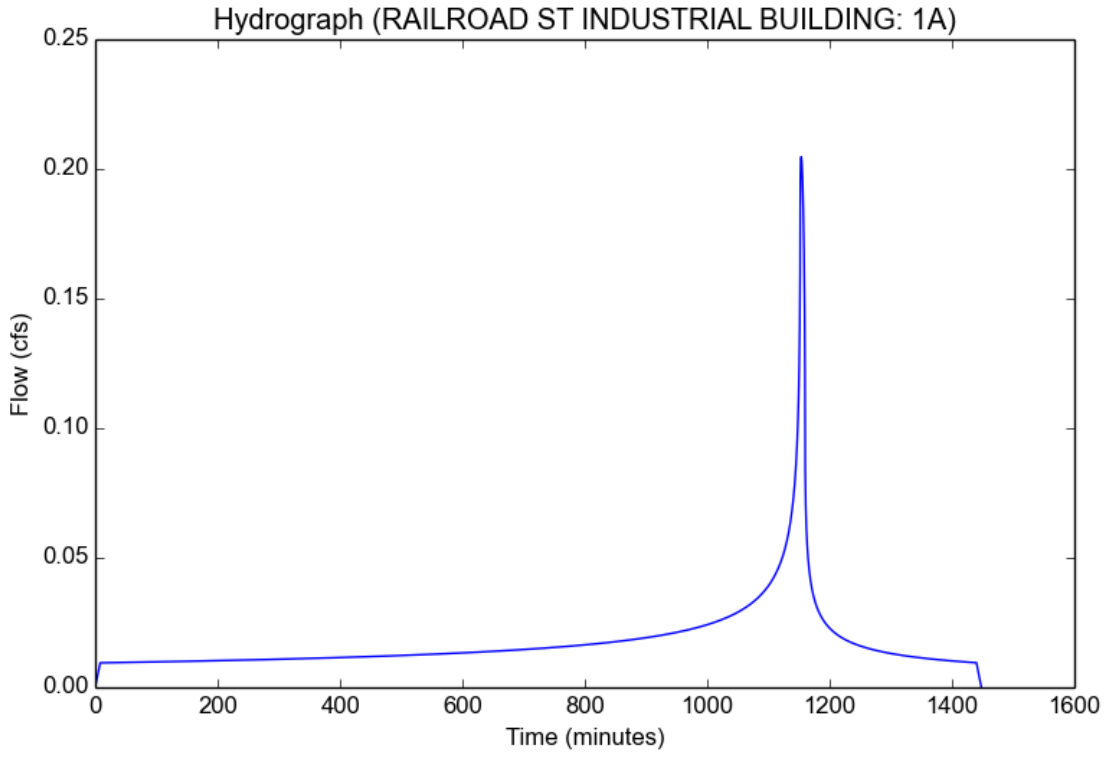
File location: O:/4100-4199/4186/SUSMP/2024-01-XX 1st Submittal LID/Appendices/Appendix A - SWQDv Calculations (PRINT IN COLOR)/HydroCalc/1
Version: HydroCalc 1.0.3

Input Parameters

Project Name	RAILROAD ST INDUSTRIAL BUILDING
Subarea ID	1A
Area (ac)	0.31
Flow Path Length (ft)	120.0
Flow Path Slope (vft/hft)	0.005
85th Percentile Rainfall Depth (in)	1.605
Percent Impervious	0.95
Soil Type	3
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	1.605
Peak Intensity (in/hr)	0.7678
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.86
Time of Concentration (min)	8.0
Clear Peak Flow Rate (cfs)	0.2047
Burned Peak Flow Rate (cfs)	0.2047
24-Hr Clear Runoff Volume (ac-ft)	0.0354
24-Hr Clear Runoff Volume (cu-ft)	1540.416



Peak Flow Hydrologic Analysis

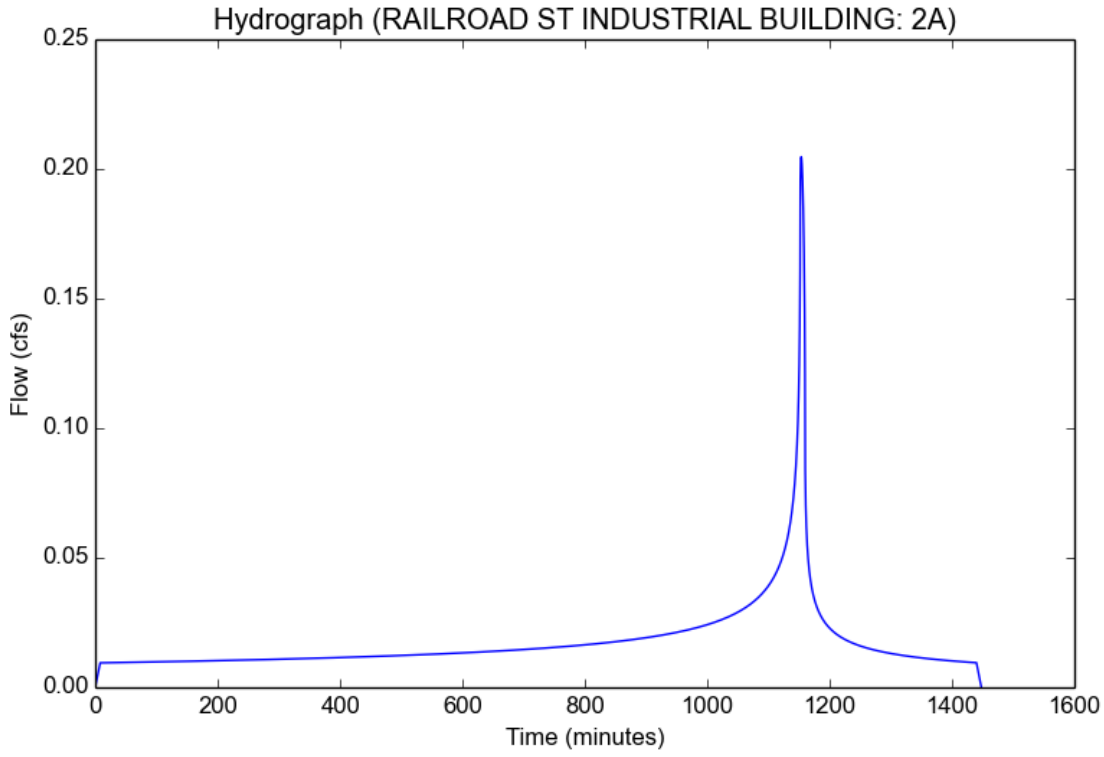
File location: O:/4100-4199/4186/SUSMP/2024-01-XX 1st Submittal LID/Appendices/Appendix A - SWQDv Calculations (PRINT IN COLOR)/HydroCalc/1
Version: HydroCalc 1.0.3

Input Parameters

Project Name	RAILROAD ST INDUSTRIAL BUILDING
Subarea ID	2A
Area (ac)	0.31
Flow Path Length (ft)	120.0
Flow Path Slope (vft/hft)	0.005
85th Percentile Rainfall Depth (in)	1.605
Percent Impervious	0.95
Soil Type	3
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	1.605
Peak Intensity (in/hr)	0.7678
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.86
Time of Concentration (min)	8.0
Clear Peak Flow Rate (cfs)	0.2047
Burned Peak Flow Rate (cfs)	0.2047
24-Hr Clear Runoff Volume (ac-ft)	0.0354
24-Hr Clear Runoff Volume (cu-ft)	1540.416



Peak Flow Hydrologic Analysis

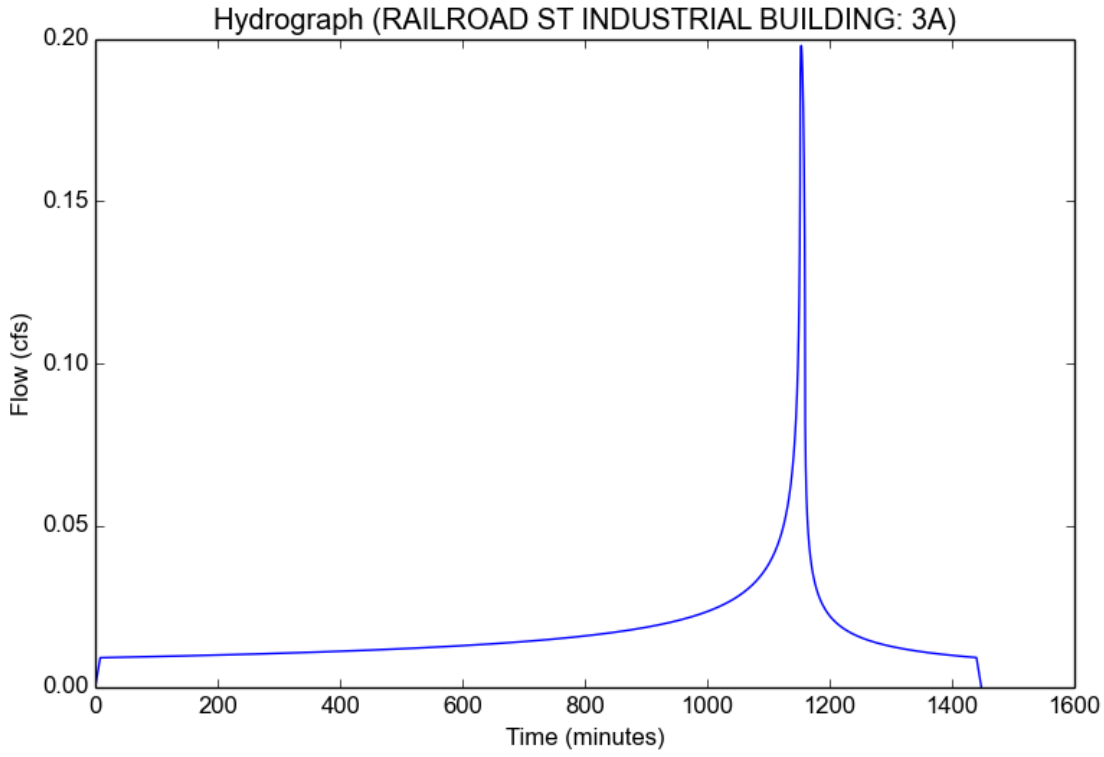
File location: O:/4100-4199/4186/SUSMP/2024-01-XX 1st Submittal LID/Appendices/Appendix A - SWQDv Calculations (PRINT IN COLOR)/HydroCalc/1
Version: HydroCalc 1.0.3

Input Parameters

Project Name	RAILROAD ST INDUSTRIAL BUILDING
Subarea ID	3A
Area (ac)	0.3
Flow Path Length (ft)	120.0
Flow Path Slope (vft/hft)	0.005
85th Percentile Rainfall Depth (in)	1.605
Percent Impervious	0.95
Soil Type	3
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	1.605
Peak Intensity (in/hr)	0.7678
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.86
Time of Concentration (min)	8.0
Clear Peak Flow Rate (cfs)	0.1981
Burned Peak Flow Rate (cfs)	0.1981
24-Hr Clear Runoff Volume (ac-ft)	0.0342
24-Hr Clear Runoff Volume (cu-ft)	1490.7252



Peak Flow Hydrologic Analysis

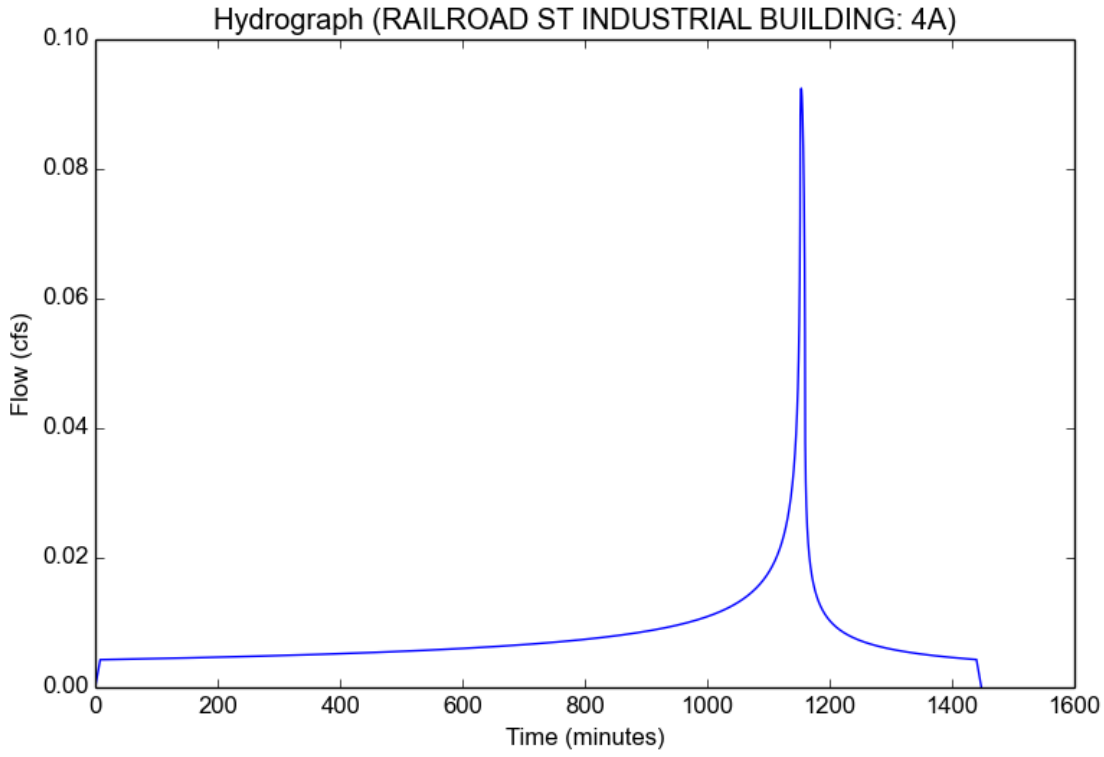
File location: O:/4100-4199/4186/SUSMP/2024-01-XX 1st Submittal LID/Appendices/Appendix A - SWQDv Calculations (PRINT IN COLOR)/HydroCalc/1
Version: HydroCalc 1.0.3

Input Parameters

Project Name	RAILROAD ST INDUSTRIAL BUILDING
Subarea ID	4A
Area (ac)	0.14
Flow Path Length (ft)	120.0
Flow Path Slope (vft/hft)	0.005
85th Percentile Rainfall Depth (in)	1.605
Percent Impervious	0.95
Soil Type	3
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	1.605
Peak Intensity (in/hr)	0.7678
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.86
Time of Concentration (min)	8.0
Clear Peak Flow Rate (cfs)	0.0924
Burned Peak Flow Rate (cfs)	0.0924
24-Hr Clear Runoff Volume (ac-ft)	0.016
24-Hr Clear Runoff Volume (cu-ft)	695.6718



Peak Flow Hydrologic Analysis

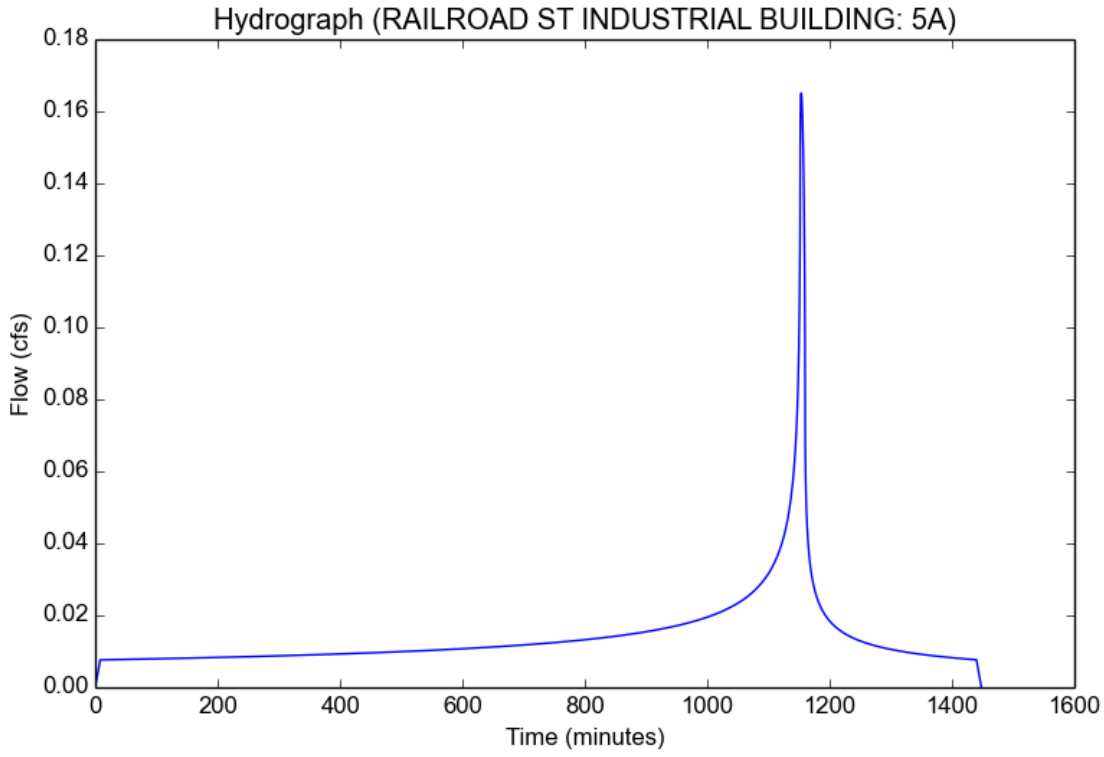
File location: O:/4100-4199/4186/SUSMP/2024-01-XX 1st Submittal LID/Appendices/Appendix A - SWQDv Calculations (PRINT IN COLOR)/HydroCalc/1
Version: HydroCalc 1.0.3

Input Parameters

Project Name	RAILROAD ST INDUSTRIAL BUILDING
Subarea ID	5A
Area (ac)	0.25
Flow Path Length (ft)	155.0
Flow Path Slope (vft/hft)	0.011
85th Percentile Rainfall Depth (in)	1.605
Percent Impervious	0.95
Soil Type	3
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	1.605
Peak Intensity (in/hr)	0.7678
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.86
Time of Concentration (min)	8.0
Clear Peak Flow Rate (cfs)	0.1651
Burned Peak Flow Rate (cfs)	0.1651
24-Hr Clear Runoff Volume (ac-ft)	0.0285
24-Hr Clear Runoff Volume (cu-ft)	1242.271



Peak Flow Hydrologic Analysis

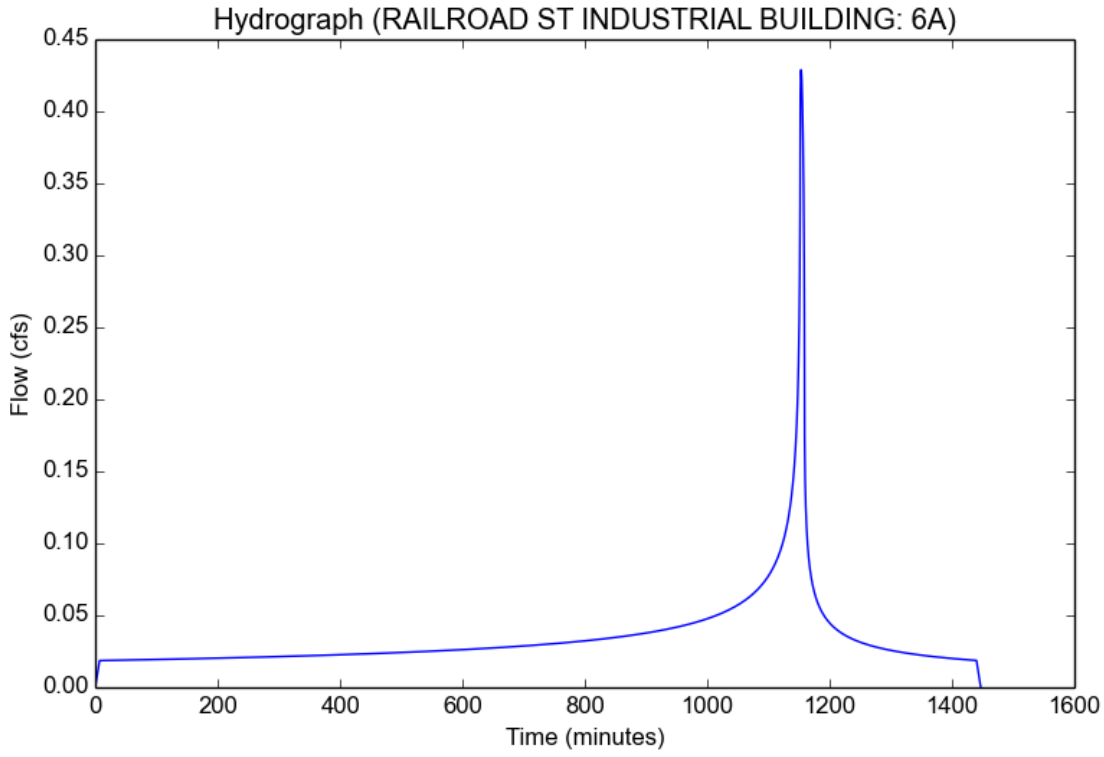
File location: O:/4100-4199/4186/SUSMP/2024-01-XX 1st Submittal LID/Appendices/Appendix A - SWQDv Calculations (PRINT IN COLOR)/HydroCalc/1
Version: HydroCalc 1.0.3

Input Parameters

Project Name	RAILROAD ST INDUSTRIAL BUILDING
Subarea ID	6A
Area (ac)	0.61
Flow Path Length (ft)	161.0
Flow Path Slope (vft/hft)	0.024
85th Percentile Rainfall Depth (in)	1.605
Percent Impervious	0.95
Soil Type	3
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	1.605
Peak Intensity (in/hr)	0.8175
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.86
Time of Concentration (min)	7.0
Clear Peak Flow Rate (cfs)	0.4289
Burned Peak Flow Rate (cfs)	0.4289
24-Hr Clear Runoff Volume (ac-ft)	0.0696
24-Hr Clear Runoff Volume (cu-ft)	3031.1407



Peak Flow Hydrologic Analysis

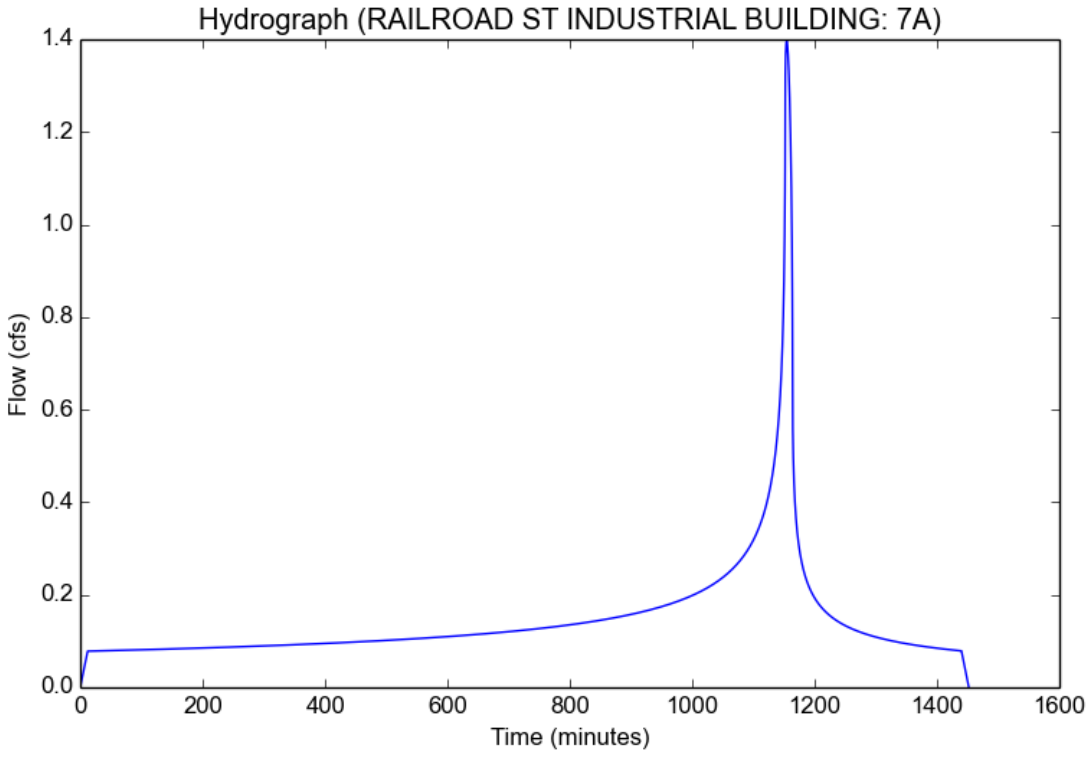
File location: O:/4100-4199/4186/SUSMP/2024-01-XX 1st Submittal LID/Appendices/Appendix A - SWQDv Calculations (PRINT IN COLOR)/HydroCalc/1
Version: HydroCalc 1.0.3

Input Parameters

Project Name	RAILROAD ST INDUSTRIAL BUILDING
Subarea ID	7A
Area (ac)	2.56
Flow Path Length (ft)	329.0
Flow Path Slope (vft/hft)	0.018
85th Percentile Rainfall Depth (in)	1.605
Percent Impervious	0.95
Soil Type	3
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	1.605
Peak Intensity (in/hr)	0.6346
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.86
Time of Concentration (min)	12.0
Clear Peak Flow Rate (cfs)	1.3971
Burned Peak Flow Rate (cfs)	1.3971
24-Hr Clear Runoff Volume (ac-ft)	0.292
24-Hr Clear Runoff Volume (cu-ft)	12720.8679



Peak Flow Hydrologic Analysis

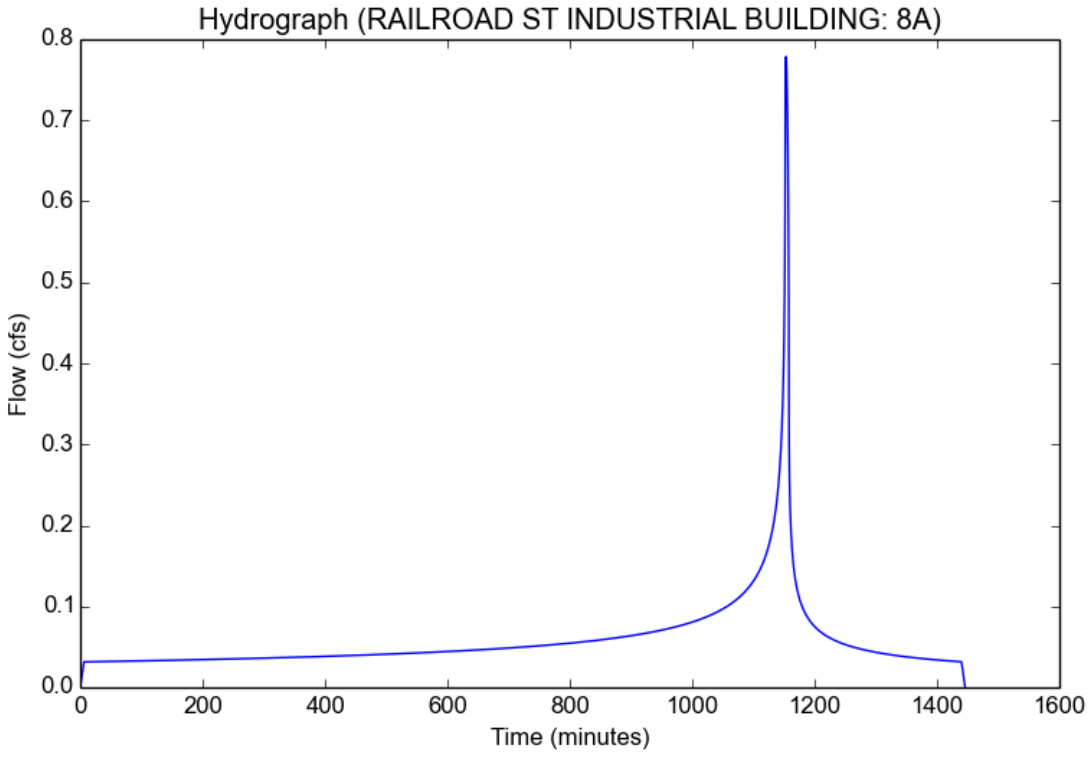
File location: O:/4100-4199/4186/SUSMP/2024-01-XX 1st Submittal LID/Appendices/Appendix A - SWQDv Calculations (PRINT IN COLOR)/HydroCalc/1
Version: HydroCalc 1.0.3

Input Parameters

Project Name	RAILROAD ST INDUSTRIAL BUILDING
Subarea ID	8A
Area (ac)	1.03
Flow Path Length (ft)	130.0
Flow Path Slope (vft/hft)	0.023
85th Percentile Rainfall Depth (in)	1.605
Percent Impervious	0.95
Soil Type	3
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	1.605
Peak Intensity (in/hr)	0.8789
Undeveloped Runoff Coefficient (Cu)	0.1042
Developed Runoff Coefficient (Cd)	0.8602
Time of Concentration (min)	6.0
Clear Peak Flow Rate (cfs)	0.7788
Burned Peak Flow Rate (cfs)	0.7788
24-Hr Clear Runoff Volume (ac-ft)	0.1175
24-Hr Clear Runoff Volume (cu-ft)	5118.1697



Peak Flow Hydrologic Analysis

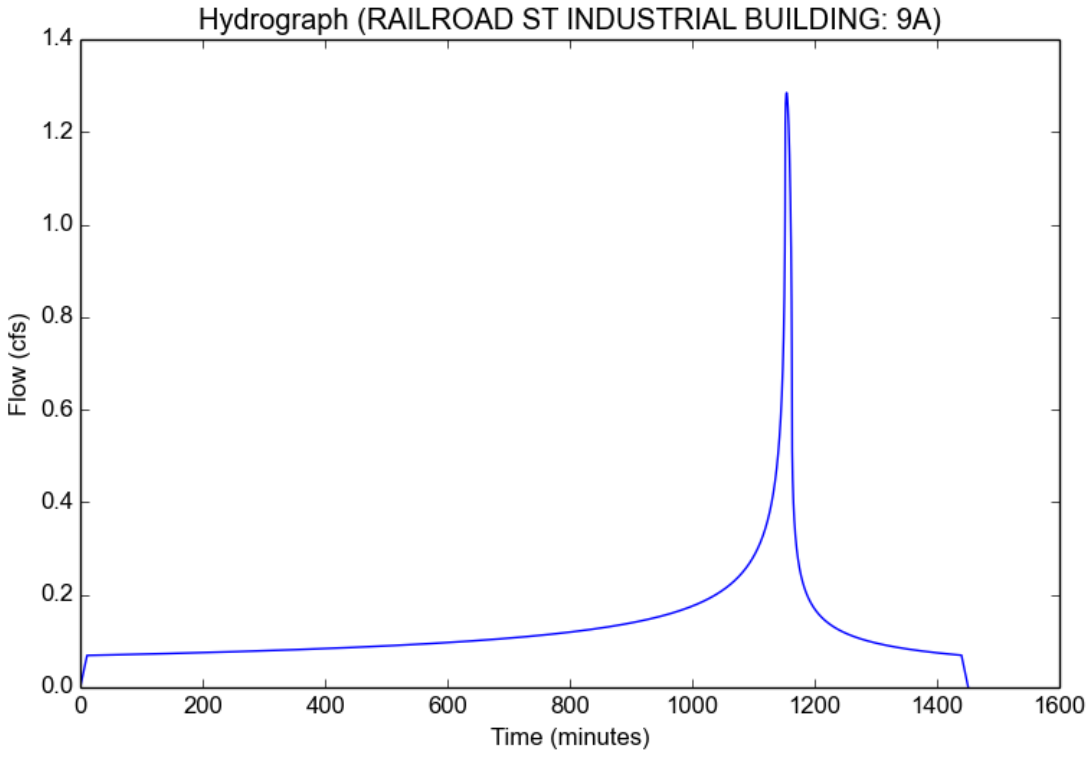
File location: O:/4100-4199/4186/SUSMP/2024-01-XX 1st Submittal LID/Appendices/Appendix A - SWQDv Calculations (PRINT IN COLOR)/HydroCalc/1
Version: HydroCalc 1.0.3

Input Parameters

Project Name	RAILROAD ST INDUSTRIAL BUILDING
Subarea ID	9A
Area (ac)	2.26
Flow Path Length (ft)	220.0
Flow Path Slope (vft/hft)	0.009
85th Percentile Rainfall Depth (in)	1.605
Percent Impervious	0.95
Soil Type	3
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	1.605
Peak Intensity (in/hr)	0.6611
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.86
Time of Concentration (min)	11.0
Clear Peak Flow Rate (cfs)	1.2848
Burned Peak Flow Rate (cfs)	1.2848
24-Hr Clear Runoff Volume (ac-ft)	0.2578
24-Hr Clear Runoff Volume (cu-ft)	11230.1379



Peak Flow Hydrologic Analysis

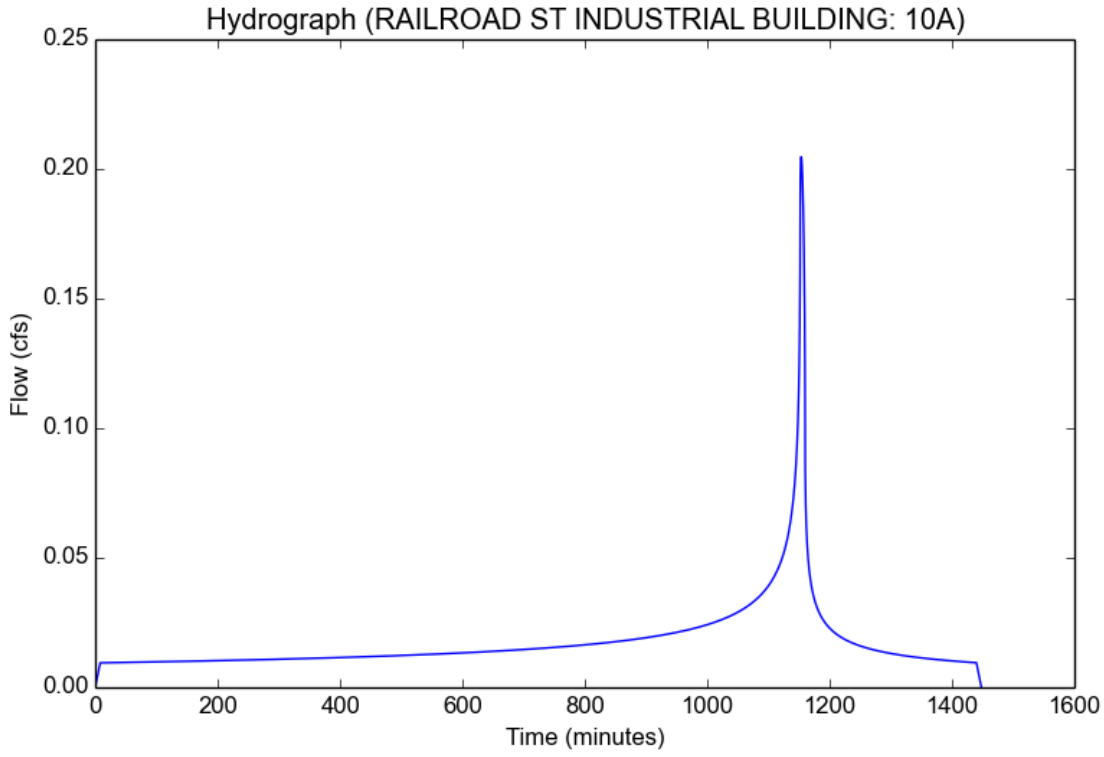
File location: O:/4100-4199/4186/SUSMP/2024-01-XX 1st Submittal LID/Appendices/Appendix A - SWQDv Calculations (PRINT IN COLOR)/HydroCalc/1
Version: HydroCalc 1.0.3

Input Parameters

Project Name	RAILROAD ST INDUSTRIAL BUILDING
Subarea ID	10A
Area (ac)	0.31
Flow Path Length (ft)	120.0
Flow Path Slope (vft/hft)	0.005
85th Percentile Rainfall Depth (in)	1.605
Percent Impervious	0.95
Soil Type	3
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	1.605
Peak Intensity (in/hr)	0.7678
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.86
Time of Concentration (min)	8.0
Clear Peak Flow Rate (cfs)	0.2047
Burned Peak Flow Rate (cfs)	0.2047
24-Hr Clear Runoff Volume (ac-ft)	0.0354
24-Hr Clear Runoff Volume (cu-ft)	1540.416



Peak Flow Hydrologic Analysis

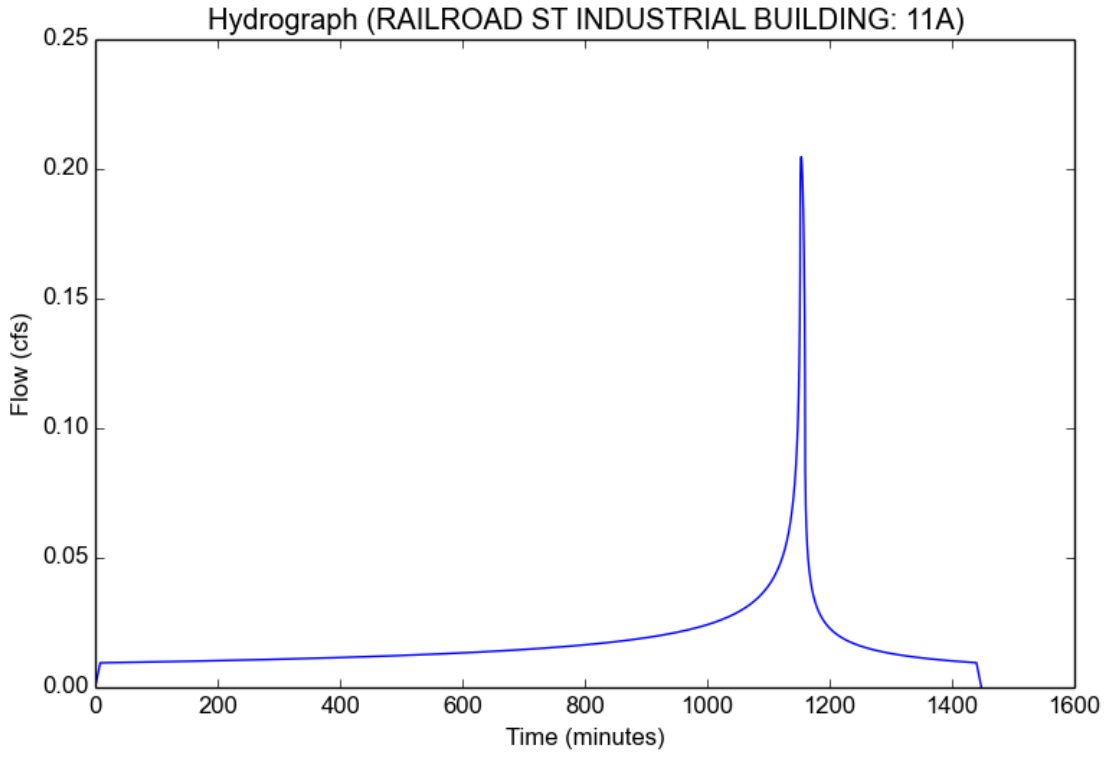
File location: O:/4100-4199/4186/SUSMP/2024-01-XX 1st Submittal LID/Appendices/Appendix A - SWQDv Calculations (PRINT IN COLOR)/HydroCalc/1
Version: HydroCalc 1.0.3

Input Parameters

Project Name	RAILROAD ST INDUSTRIAL BUILDING
Subarea ID	11A
Area (ac)	0.31
Flow Path Length (ft)	120.0
Flow Path Slope (vft/hft)	0.005
85th Percentile Rainfall Depth (in)	1.605
Percent Impervious	0.95
Soil Type	3
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	1.605
Peak Intensity (in/hr)	0.7678
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.86
Time of Concentration (min)	8.0
Clear Peak Flow Rate (cfs)	0.2047
Burned Peak Flow Rate (cfs)	0.2047
24-Hr Clear Runoff Volume (ac-ft)	0.0354
24-Hr Clear Runoff Volume (cu-ft)	1540.416



Peak Flow Hydrologic Analysis

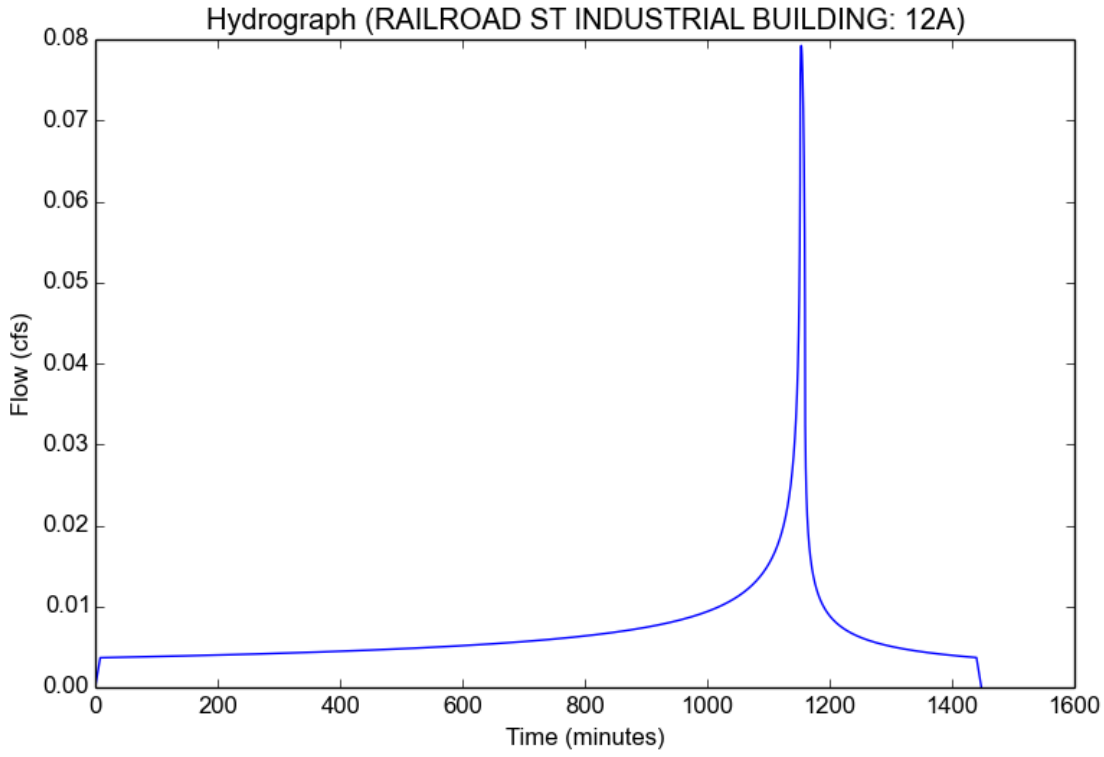
File location: O:/4100-4199/4186/SUSMP/2024-01-XX 1st Submittal LID/Appendices/Appendix A - SWQDv Calculations (PRINT IN COLOR)/HydroCalc/1
Version: HydroCalc 1.0.3

Input Parameters

Project Name	RAILROAD ST INDUSTRIAL BUILDING
Subarea ID	12A
Area (ac)	0.12
Flow Path Length (ft)	120.0
Flow Path Slope (vft/hft)	0.005
85th Percentile Rainfall Depth (in)	1.605
Percent Impervious	0.95
Soil Type	3
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	1.605
Peak Intensity (in/hr)	0.7678
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.86
Time of Concentration (min)	8.0
Clear Peak Flow Rate (cfs)	0.0792
Burned Peak Flow Rate (cfs)	0.0792
24-Hr Clear Runoff Volume (ac-ft)	0.0137
24-Hr Clear Runoff Volume (cu-ft)	596.2901



Peak Flow Hydrologic Analysis

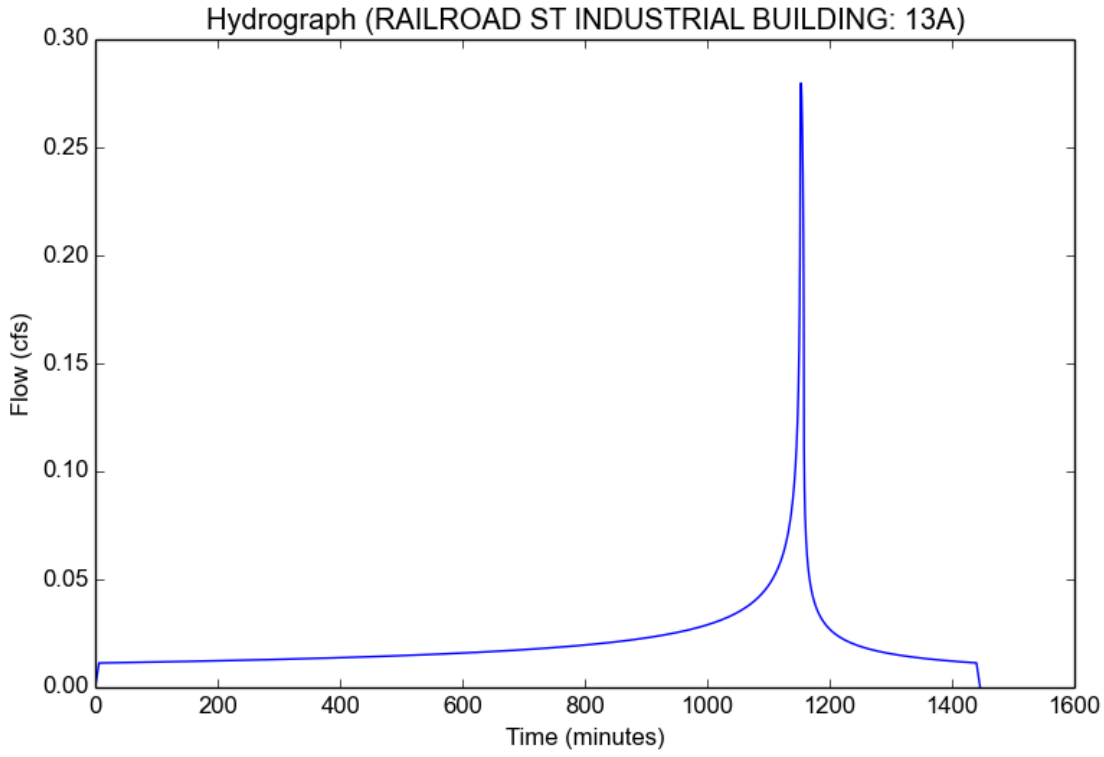
File location: O:/4100-4199/4186/SUSMP/2024-01-XX 1st Submittal LID/Appendices/Appendix A - SWQDv Calculations (PRINT IN COLOR)/HydroCalc/1
Version: HydroCalc 1.0.3

Input Parameters

Project Name	RAILROAD ST INDUSTRIAL BUILDING
Subarea ID	13A
Area (ac)	0.37
Flow Path Length (ft)	117.0
Flow Path Slope (vft/hft)	0.015
85th Percentile Rainfall Depth (in)	1.605
Percent Impervious	0.95
Soil Type	3
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	1.605
Peak Intensity (in/hr)	0.8789
Undeveloped Runoff Coefficient (Cu)	0.1042
Developed Runoff Coefficient (Cd)	0.8602
Time of Concentration (min)	6.0
Clear Peak Flow Rate (cfs)	0.2798
Burned Peak Flow Rate (cfs)	0.2798
24-Hr Clear Runoff Volume (ac-ft)	0.0422
24-Hr Clear Runoff Volume (cu-ft)	1838.5658



Peak Flow Hydrologic Analysis

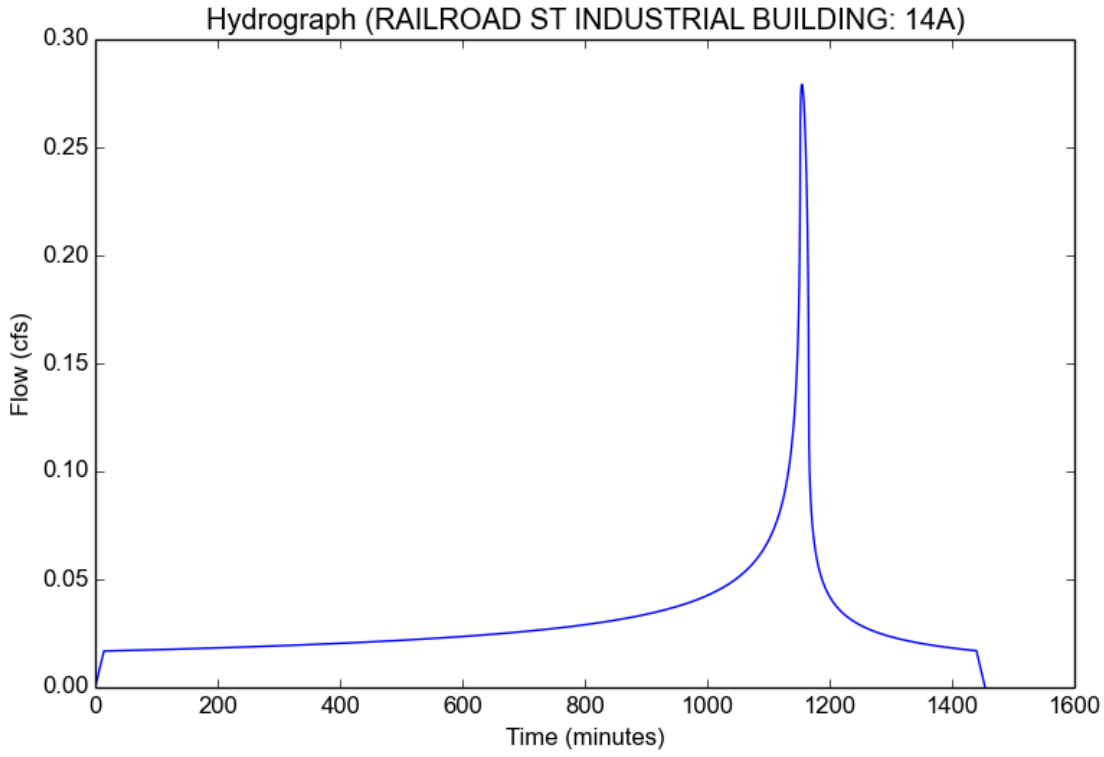
File location: O:/4100-4199/4186/SUSMP/2024-01-XX 1st Submittal LID/Appendices/Appendix A - SWQDv Calculations (PRINT IN COLOR)/HydroCalc/1
Version: HydroCalc 1.0.3

Input Parameters

Project Name	RAILROAD ST INDUSTRIAL BUILDING
Subarea ID	14A
Area (ac)	0.55
Flow Path Length (ft)	334.0
Flow Path Slope (vft/hft)	0.007
85th Percentile Rainfall Depth (in)	1.605
Percent Impervious	0.95
Soil Type	3
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	1.605
Peak Intensity (in/hr)	0.5902
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.86
Time of Concentration (min)	14.0
Clear Peak Flow Rate (cfs)	0.2792
Burned Peak Flow Rate (cfs)	0.2792
24-Hr Clear Runoff Volume (ac-ft)	0.0627
24-Hr Clear Runoff Volume (cu-ft)	2733.0008



Peak Flow Hydrologic Analysis

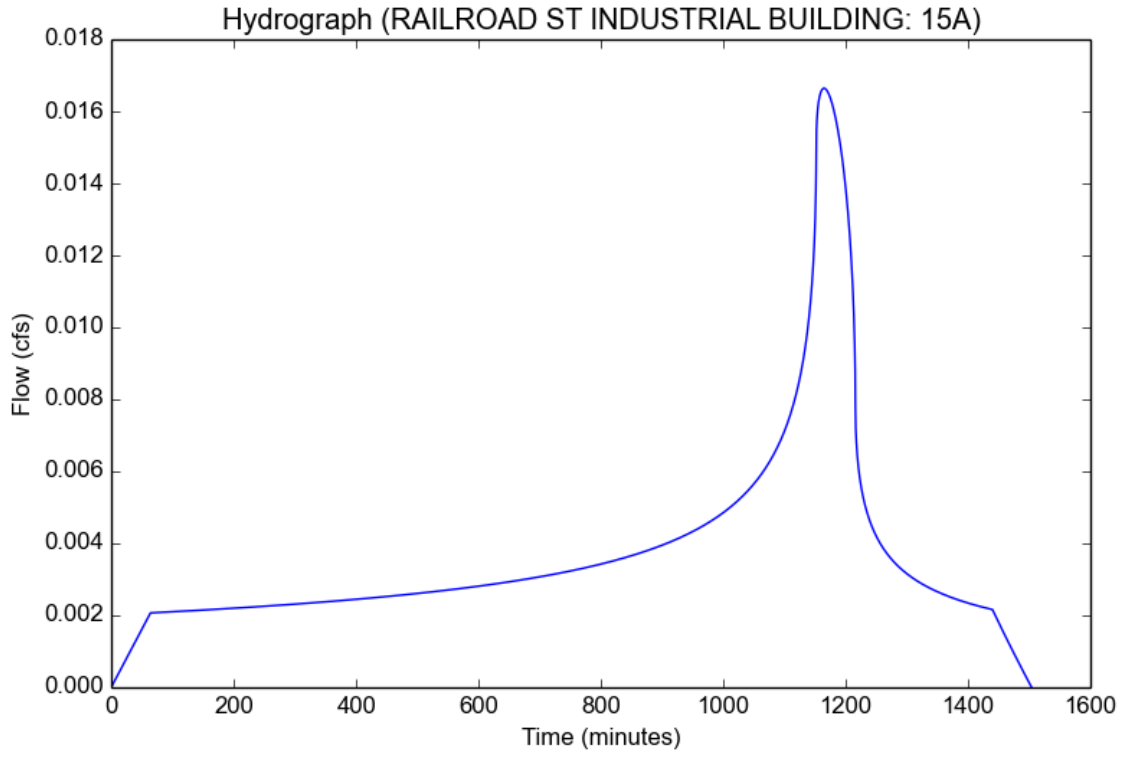
File location: O:/4100-4199/4186/SUSMP/2024-01-XX 1st Submittal LID/Appendices/Appendix A - SWQDv Calculations (PRINT IN COLOR)/HydroCalc/1
Version: HydroCalc 1.0.3

Input Parameters

Project Name	RAILROAD ST INDUSTRIAL BUILDING
Subarea ID	15A
Area (ac)	0.32
Flow Path Length (ft)	624.0
Flow Path Slope (vft/hft)	0.006
85th Percentile Rainfall Depth (in)	1.605
Percent Impervious	0.1
Soil Type	3
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	1.605
Peak Intensity (in/hr)	0.2889
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.18
Time of Concentration (min)	64.0
Clear Peak Flow Rate (cfs)	0.0166
Burned Peak Flow Rate (cfs)	0.0166
24-Hr Clear Runoff Volume (ac-ft)	0.0076
24-Hr Clear Runoff Volume (cu-ft)	332.8306



Peak Flow Hydrologic Analysis

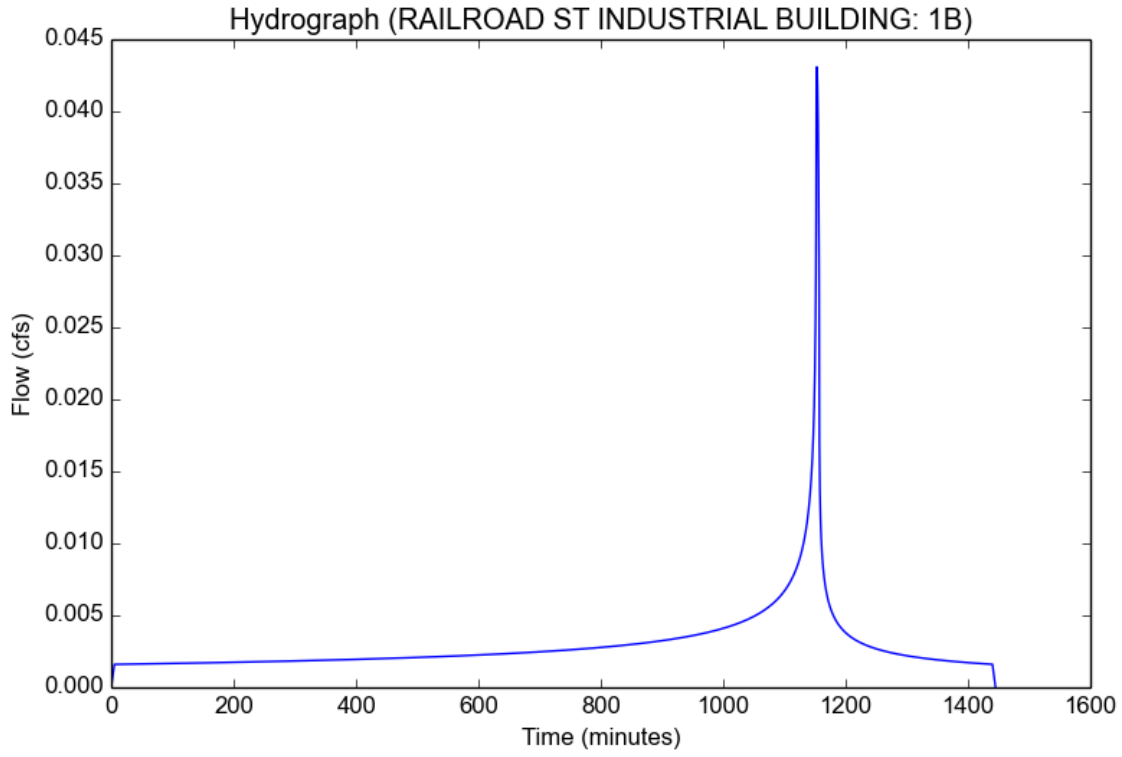
File location: O:/4100-4199/4186/SUSMP/2024-01-XX 1st Submittal LID/Appendices/Appendix A - SWQDv Calculations (PRINT IN COLOR)/HydroCalc/1
Version: HydroCalc 1.0.3

Input Parameters

Project Name	RAILROAD ST INDUSTRIAL BUILDING
Subarea ID	1B
Area (ac)	0.05
Flow Path Length (ft)	20.0
Flow Path Slope (vft/hft)	0.005
85th Percentile Rainfall Depth (in)	1.605
Percent Impervious	1.0
Soil Type	3
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	1.605
Peak Intensity (in/hr)	0.9576
Undeveloped Runoff Coefficient (Cu)	0.1219
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.0431
Burned Peak Flow Rate (cfs)	0.0431
24-Hr Clear Runoff Volume (ac-ft)	0.006
24-Hr Clear Runoff Volume (cu-ft)	260.0101



Peak Flow Hydrologic Analysis

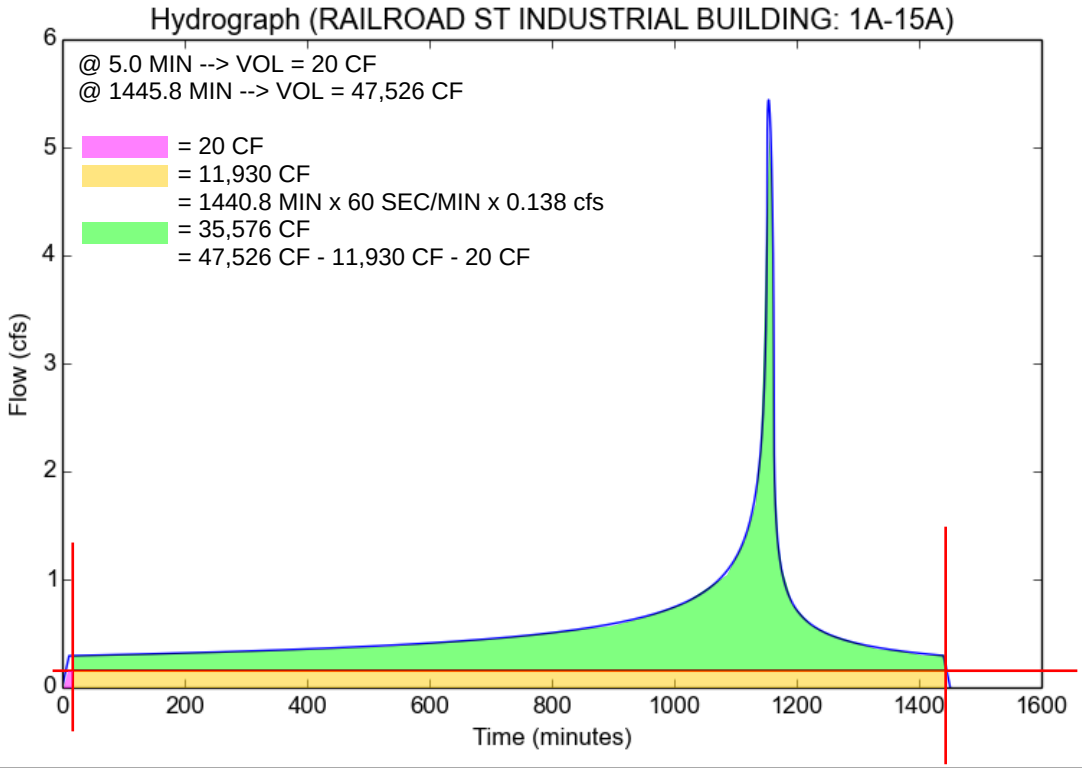
File location: O:/4100-4199/4186/SUSMP/2024-01-XX 1st Submittal LID/Appendices/Appendix A - SWQDv Calculations (PRINT IN COLOR)/HydroCalc/1
Version: HydroCalc 1.0.3

Input Parameters

Project Name	RAILROAD ST INDUSTRIAL BUILDING
Subarea ID	1A-15A
Area (ac)	9.75
Flow Path Length (ft)	220.0
Flow Path Slope (vft/hft)	0.009
85th Percentile Rainfall Depth (in)	1.605
Percent Impervious	0.93
Soil Type	3
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	1.605
Peak Intensity (in/hr)	0.6611
Undeveloped Runoff Coefficient (Cu)	0.1
Developed Runoff Coefficient (Cd)	0.844
Time of Concentration (min)	11.0
Clear Peak Flow Rate (cfs)	5.4398
Burned Peak Flow Rate (cfs)	5.4398
24-Hr Clear Runoff Volume (ac-ft)	1.0915
24-Hr Clear Runoff Volume (cu-ft)	47547.2345



Inputs: RAILROAD ST INDUSTRIAL BUILDING

Subarea ID	Area (ac)	Flow Path L	Flow Path S	85th Perce	Percent Im	Soil Type	Design Sto	Fire Factor
1A-15A	9.75	220	0.009	1.605	0.93	3	85th perce	0

Outputs: RAILROAD ST INDUSTRIAL BUILDING

Area (ac)	Modeled (8	Time of Co	Clear Peak	24-Hr Clear	Burned Pea	Peak Inten	Undevelop	Developed
1A-15A	1.605	11	5.439847	1.091534	5.439847	0.661058	0.1	0.844

Hydrograph: RAILROAD ST INDUSTRIAL BUILDING - 1A-15A

Time (min)	Incrementa	Incrementa	Intensity (i	Undevelop	Developed	Clear Peak	Incrementa	Cumulative
0	0	0	0	0	0	0	0	0
0.2	7.36E-05	0.000118	0	0	0	0.005315	0.03189	0.03189
0.4	0.000147	0.000236	0	0	0	0.01063	0.09567	0.12756
0.6	0.000221	0.000354	0	0	0	0.015945	0.15945	0.287009
0.8	0.000294	0.000473	0	0	0	0.02126	0.223229	0.510239
1	0.000368	0.000591	0	0	0	0.026575	0.287009	0.797248
1.2	0.000442	0.000709	0	0	0	0.03189	0.350789	1.148037
1.4	0.000515	0.000827	0	0	0	0.037205	0.414569	1.562606
1.6	0.000589	0.000945	0	0	0	0.04252	0.478349	2.040954
1.8	0.000663	0.001064	0	0	0	0.047835	0.542128	2.583083
2	0.000736	0.001182	0	0	0	0.05315	0.605908	3.188991
2.2	0.00081	0.0013	0	0	0	0.058465	0.669688	3.858679
2.4	0.000884	0.001418	0	0	0	0.06378	0.733468	4.592147
2.6	0.000957	0.001537	0	0	0	0.069095	0.797248	5.389395
2.8	0.001031	0.001655	0	0	0	0.07441	0.861028	6.250422
3	0.001105	0.001773	0	0	0	0.079725	0.924807	7.17523
3.2	0.001179	0.001892	0	0	0	0.08504	0.988587	8.163817
3.4	0.001252	0.00201	0	0	0	0.090355	1.052367	9.216184
3.6	0.001326	0.002128	0	0	0	0.09567	1.116147	10.33233
3.8	0.0014	0.002247	0	0	0	0.100985	1.179927	11.51226
4	0.001473	0.002365	0	0	0	0.1063	1.243706	12.75596
4.2	0.001547	0.002483	0	0	0	0.111615	1.307486	14.06345
4.4	0.001621	0.002602	0	0	0	0.11693	1.371266	15.43472
4.6	0.001695	0.00272	0	0	0	0.122245	1.435046	16.86976
4.8	0.001768	0.002838	0	0	0	0.12756	1.498826	18.36859
5	0.001842	0.002957	0	0	0	0.132875	1.562606	19.93119
5.2	0.001916	0.003075	0	0	0	0.13819	1.626385	21.55758
5.4	0.00199	0.003193	0	0	0	0.143505	1.690165	23.24774
5.6	0.002063	0.003312	0	0	0	0.14882	1.753945	25.00169
5.8	0.002137	0.00343	0	0	0	0.154135	1.817725	26.81941
6	0.002211	0.003549	0	0	0	0.15945	1.881505	28.70092
6.2	0.002285	0.003667	0	0	0	0.164765	1.945285	30.6462
6.4	0.002359	0.003786	0	0	0	0.17008	2.009064	32.65527
6.6	0.002432	0.003904	0	0	0	0.175395	2.072844	34.72811
6.8	0.002506	0.004023	0	0	0	0.180709	2.136624	36.86474

1445.2	1	1.605	0.018778	0.1	0.844	0.154523	1.886405	47520.39
1445.4	1	1.605	0.018127	0.1	0.844	0.14917	1.822157	47522.21
1445.6	1	1.605	0.017477	0.1	0.844	0.143819	1.75793	47523.97
1445.8	1	1.605	0.016827	0.1	0.844	0.138469	1.693725	47525.66
1446	1	1.605	0.016177	0.1	0.844	0.133121	1.629542	47527.29
1446.2	1	1.605	0.015527	0.1	0.844	0.127775	1.565379	47528.86
1446.4	1	1.605	0.014878	0.1	0.844	0.122431	1.501238	47530.36
1446.6	1	1.605	0.014229	0.1	0.844	0.117089	1.437119	47531.8
1446.8	1	1.605	0.01358	0.1	0.844	0.111748	1.37302	47533.17
1447	1	1.605	0.012931	0.1	0.844	0.106409	1.308943	47534.48
1447.2	1	1.605	0.012282	0.1	0.844	0.101072	1.244887	47535.72
1447.4	1	1.605	0.011634	0.1	0.844	0.095737	1.180852	47536.91
1447.6	1	1.605	0.010986	0.1	0.844	0.090403	1.116838	47538.02
1447.8	1	1.605	0.010338	0.1	0.844	0.085071	1.052846	47539.07
1448	1	1.605	0.00969	0.1	0.844	0.079741	0.988874	47540.06
1448.2	1	1.605	0.009043	0.1	0.844	0.074413	0.924924	47540.99
1448.4	1	1.605	0.008395	0.1	0.844	0.069086	0.860995	47541.85
1448.6	1	1.605	0.007748	0.1	0.844	0.063761	0.797087	47542.65
1448.8	1	1.605	0.007102	0.1	0.844	0.058438	0.7332	47543.38
1449	1	1.605	0.006455	0.1	0.844	0.053117	0.669333	47544.05
1449.2	1	1.605	0.005808	0.1	0.844	0.047798	0.605488	47544.65
1449.4	1	1.605	0.005162	0.1	0.844	0.04248	0.541664	47545.2
1449.6	1	1.605	0.004516	0.1	0.844	0.037164	0.477861	47545.67
1449.8	1	1.605	0.00387	0.1	0.844	0.031849	0.414079	47546.09
1450	1	1.605	0.003225	0.1	0.844	0.026537	0.350317	47546.44
1450.2	1	1.605	0.002579	0.1	0.844	0.021226	0.286577	47546.73
1450.4	1	1.605	0.001934	0.1	0.844	0.015917	0.222857	47546.95
1450.6	1	1.605	0.001289	0.1	0.844	0.01061	0.159158	47547.11
1450.8	1	1.605	0.000645	0.1	0.844	0.005304	0.095481	47547.2
1451	1	1.605	0	0.1	0.844	0	0.031823	47547.23

1451 min x 60 (sec/min) x 0.138 cfs = 12,014 cf biofiltered

Date: 7-20-2015

Subject: Modular Wetlands – Compliance with Los Angeles County Appendix H

To Whom It May Concern,

The Modular Wetland System Linear and WetlandMod are horizontal flow biofiltration systems capable of utilizing various types of biofiltration media with different hydraulic conductivities and characteristics. The system's horizontal flow design allows for maximum media surface area with smaller footprints than traditional downward flow biofiltration systems. This horizontal flow design also minimizes clogging concerns and maximizes the treatment capability of all types of biofiltration media.

To comply with County of Los Angeles Department of Public Works, Low Impact Development Standards Manual, February 2014 the Modular Wetland System and WetlandMod will utilizes planting/storage media compliant with the specifications found in Appendix E, Section Bio-1: Biofiltration of the Manual.

The planting media used will achieve a long term, in-place infiltration rate of at least 5 inches an hours and potentially up to 12 inches an hour. The media will consist of 60 to 80% fine sand and 20 to 40% compost. The sand will be free of wood, waster, coating such as clay, stone dust, carbonate, etc. or any other deleterious material. All aggregate passing the No. 200 sieve size should be non-plastic. Sand for bioretention should be analyzed by an accredited lab such as Group Delta Consultants of Torrance, CA using #200, #100, #40, #30, #16, #8, #4, and 3/8 sieves (ASTM D 422 or as approved by the local permitting authority) and meet the following gradation (Note: all sands complying with ASTM C33 for fine aggregate comply with the gradation requirements provided in table below):

Particle Size (ASTM D422)	% Passing by Weight
3/8 inch	100%
#4	90-100%
#8	70-100%
#16	40-95%
#30	15-70%
#40	5-55%
#110	0-15%
#200	0-5%

P.O. Box 888
Oceanside, CA 92049
T 760.433.7640
F 760.433.3167
info@modularwetlands.com
www.modularwetlands.com

Compost should be a well decomposed, stable, weed free organic matter source derived from waste materials including yard debris, wood wastes, or other organic materials not including manure or biosolids meeting standards developed by the US Composting Council (USCC). The product shall be certified through the USCC Seal of Testing Assurance (STA) Program (a compost testing and information disclosure program). Compost quality will be verified via a lab analysis based on requirements in Appendix E, Section Bio-1: Biofiltration of the Manual. Following is a list of those requirements:

- Feedstock materials must be specified and include one or more of the following: landscape/yard trimmings, grass clippings, food scraps, and agricultural crop residues.
- pH between 6.5 and 8.0 (may vary with plant palette)
- Organic Matter: 35 to 75 percent dry weight basis
- Carbon and Nitrogen Ratio: 15:1 < C:N < 25:1
- Maturity/Stability: Compost must have a dark brown color and a soil-like odor. Compost exhibiting a sour or putrid smell, containing recognizable grass or leaves, or is hot (120°F) upon delivery or rewetting is not acceptable.
- Toxicity: any one of the following measures is sufficient to indicate nontoxicity:
    - $NH_4:NH_3 < 3$
    - Ammonium < 500 ppm, dry weight basis
    - Seed germination > 80 percent of control
    - Plant trials > 80 percent of control
    - Solvita® > 5 index value
- Nutrient content:
    - Total Nitrogen content ≥ 0.9 percent preferred
    - Total Boron should be < 80 ppm; soluble boron < 2.5 ppm

P.O. Box 888
Oceanside, CA 92049
T 760.433.7640
F 760.433.3167
info@modularwetlands.com
www.modularwetlands.com

- Salinity: < 6.0 mmhos/cm

- Compost for biofiltration area should be analyzed by an accredited laboratory using #200, ¼-inch, ½-inch, and 1-inch sieves (ASTM D422) and meet the gradation requirements in the table below:

Particle Size (ASTM D422)	% Passing by Weight
1 inch	99-100
½ inch	90-100
¼ inch	40-90
#200	2-10

Tests should be sufficiently recent to represent the actual material that is anticipated to be delivered to the site. If processes or sources used by the supplier have changed significantly since the most recent testing, new tests should be requested. The gradation of compost used in biofiltration soil media is believed to play an important role in the saturated infiltration rate of the media. To achieve a higher saturated infiltration rate, it may be necessary to utilize compost at the coarser end of the range (minimum percent passing). The percent passing the #200 sieve (fines) is believed to be the most important factor in hydraulic conductivity. In addition, coarser compost mix provides more heterogeneity of the biofiltration soil media, which is believed to be advantageous for more rapid development of soil structure needed to support healthy biological processes. This may be an advantage for plant establishment with lower nutrient and water input.

Additional, submittals will be provided including a sample of the soil, certification from the supplier and/or accredited laboratory along with an organic content analysis and organic grain size analysis, along with the following as required in Appendix E, Section Bio-1: Biofiltration of the Manual:

- Biofiltration soil media will be analyzed by an accredited geotechnical laboratory such as Group Delta Consultants of Torrance, CA for the following tests:

    - Moisture – density relationships (compaction tests) must be conducted on biofiltration soil media. Biofiltration soil media for the permeability test shall be compacted to 85 to 90 percent of the maximum dry density (ASTM D1557).

    - Constant head permeability testing in accordance with ASTM D2434 shall be conducted on a minimum of two samples with a 6-inch mold and vacuum saturation.

Several sources of this media have been identified including the following companies who have stated they can and have provided a soil mix that meets Appendix H requirements:

- Agri Service of Oceanside, California
- Gale Materials of Corona, California
- Earthworks of Riverside, California

Gale Materials and Earthworks were recommended by a landscape engineer at the County of Los Angeles in June via one of our contacts at the Los Angeles County Department of Public Works, Design Drainage Section.

Following is an example of the reports and submittals that will be provided during final submittal to the county on a project by project basis.

If you have any questions please feel free to contact us at your convenience.

Sincerely,

Zachariha J. Kent
Stormwater Engineer
Modular Wetland System, Inc.

WALLACE LABS	MEDIA REPORT	Print Date	Feb. 16, 2015	Receive Date	2/16/15
365 Coral Circle	Location	Agriservice			
El Segundo, CA 90245	Requester	Mary Matava			
(310) 615-0116	graphic interpretation: * very low, ** low, *** moderate				
ammonium bicarbonate/DTPA	* * * * high, * * * * * very high				

extractable - mg/kg soil		Sample ID Number	15-47-14	
		Sample Description	El Corazon Compost	
	elements			
	iron		28.06	
	manganese		53.58	
	zinc		27.01	
	copper		3.27	
	boron		4.21	
	calcium		1,546.84	
	magnesium		734.65	
	sodium		1,276.75	
	sulfur		165.37	
	molybdenum		0.53	
	nickel		0.34	
The following trace	**aluminum**		n d	
elements may be toxic	**arsenic**		0.28	
The degree of toxicity	**barium**		0.99	
depends upon the pH of	**cadmium**		0.10	
the soil, soil texture,	**chromium**		0.30	
organic matter, and the	**cobalt**		0.25	
concentrations of the	**lead**		1.87	
individual elements as well	**lithium**		1.89	
as to their interactions	**mercury**		n d	
	selenium		n d	
The pH optimum depends	**silver**		n d	
upon soil organic	**strontium**		7.30	
matter and soil content-	**tin**		n d	
	vanadium		0.60	
	Saturation Extract			
	pH value		8.22	
The ECe is a measure of	**ECe (milli-**		4.91	
the media salinity:	**mho/cm)**			millieq/l
good at 200 ppm	**calcium**		83.7	4.2
good at 25 ppm	**magnesium**		49.6	4.1
	sodium		337.6	14.7
good at 25 ppm	**ammonium as N**		0.8	0.1
good at 150 ppm	**potassium**		815.0	20.8
	cation sum			43.9
problems over 150 ppm	**chloride**		974	27.4
good at 100 ppm	**nitrate as N**		10.0	0.7
good at 40 ppm	**phosphorus as P**		6.9	0.2
toxic over 800	**sulfate as S**		68.9	4.3
	anion sum			32.7
toxic over 1 for many plants	**boron as B**		0.37	
increasing problems start at 3	**SAR**		7.2	
est. gypsum requirement-lbs./cubic yard			19	
	Total Carbon, dry weight basis		25.63%	
	Carbon:Nitrogen Ratio		22.2	
	lime (calcium carbonate)		no	
	organic matter, dry weight basis		51.25%	
	moisture content of media		86.6%	
	half saturation percentage		159.4%	

Elements are expressed as mg/kg dry soil or mg/l for saturation extract.

pH and ECe are measured in a saturation paste extract. nd means not detected.

Analytical data determined on soil fraction passing a 2 mm sieve.

WALLACE LABS
365 Coral Circle
El Segundo, CA 90245
(310) 615-0116

SOILS REPORT

Print Date Apr. 27, 2015 Receive Date 4/24/15

Location Agri Service
Requester Mary Matava

graphic interpretation: * very low, ** low, *** moderate
* * * * high, * * * * * very high

ammonium bicarbonate/DTPA
extractable - mg/kg soil
Interpretation of data
low medium high

	Sample ID Number	15-117-05	
	Sample Description	3) Bioswale Mix 70	
	elements		graphic
0 - 7 8-15 over 15	**phosphorus**	50.40	*****
0-60 60 -120 121-180	**potassium**	702.97	*****
0 - 4 4 - 10 over 10	**iron**	6.73	***
0- 0.5 0.6- 1 over 1	**manganese**	4.80	****
0 - 1 1 - 1.5 over 1.5	**zinc**	4.19	****
0- 0.2 0.3- 0.5 over 0.5	**copper**	0.41	***
0- 0.2 0.2- 0.5 over 1	**boron**	0.68	****
	calcium	391.50	***
	magnesium	218.16	*****
	sodium	274.15	****
	sulfur	94.40	**
	molybdenum	0.05	***
	nickel	0.05	*
The following trace elements may be toxic	**aluminum**	n d	*
	arsenic	0.02	*
The degree of toxicity depends upon the pH of the soil, soil texture, organic matter, and the concentrations of the individual elements as well as to their interactions.	**barium**	0.78	*
	cadmium	0.03	*
	chromium	n d	*
	cobalt	0.11	*
	lead	0.40	*
	lithium	0.32	*
	mercury	n d	*
	selenium	n d	*
The pH optimum depends upon soil organic matter and clay content- for clay and loam soils: under 5.2 is too acidic 6.5 to 7 is ideal over 8.0 is too alkaline	**silver**	n d	*
	strontium	1.80	*
	tin	n d	*
	vanadium	n d	*
	Saturation Extract		
	pH value	7.53	****
The ECe is a measure of the soil salinity: 1-2 affects a few plants 2-4 affects some plants, > 4 affects many plants.	**ECe (milli-mho/cm)**	4.83	*****
			millieq/l
	calcium	188.0	9.4
	magnesium	98.8	8.2
	sodium	416.8	18.1
	potassium	401.8	10.3
	cation sum		46.0
problems over 150 ppm	**chloride**	1,098	30.9
good 20 - 30 ppm	**nitrate as N**	21	1.5
	phosphorus as P	1.8	0.1
toxic over 800	**sulfate as S**	152.5	9.5
	anion sum		42.0
toxic over 1 for many plants	**boron as B**	0.39	**
increasing problems start at 3	**SAR**	6.1	****
est. gypsum requirement-lbs./1000 sq. ft.		47	
	infiltration rate inches/hour	7.61	sand - 91.9%
	soil texture	sand	silt - 7.9%
	lime (calcium carbonate)	no	clay - 0.2%
	organic matter	fair/low	
	moisture content of soil	6.5%	gravel over 2 mm
	half saturation percentage	22.0%	15.6%

Elements are expressed as mg/kg dry soil or mg/l for saturation extract.
pH and ECe are measured in a saturation paste extract. nd means not detected.
Sand, silt, clay and mineral content based on fraction passing a 2 mm screen.

SUPERIOR READY MIX

7718 Mission Gorge Rd.
San Diego Ca. 92120

Phone: 619-265-0813
Fax: 619-286-1354

Plant **Superior**

Contractor: Agri Service

Source **Superior**

Material Type **WCS** **Pa**

Project:

Sample From **Stock Pile**

Date **1/7/2015**

Tested By **James Pratt**

Sampled by:

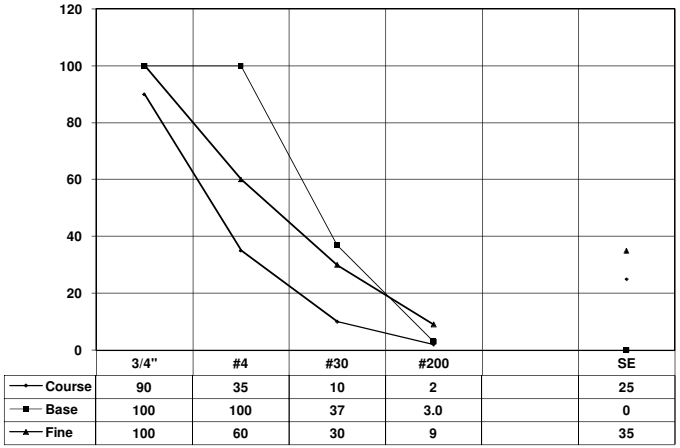
TABLE A:
SIEVE ANALYSIS (ASTM C136), percent passing

Sieve Size	MAT WEIGHT	% PASSING
1-1/2"	0	100
1"	0	100
3/4"	0	100
1/2"	0	100
3/8"	0	100
#4	1	100
#8	53	90
#16	198	61
#30	321	37
#50	425	17
#100	476	7
#200	497	3.0

SA WET WT	513	
SA DRY WT	513	
SE WET WT	0	
SE DRY WT	0	
DIFF	0	
%MOIST	#DIV/0!	
+#4 WET WT	513	
-#4 WET WT	0	
-#4 DRY WT	513	

Sand Equivalent **76**

Test Results

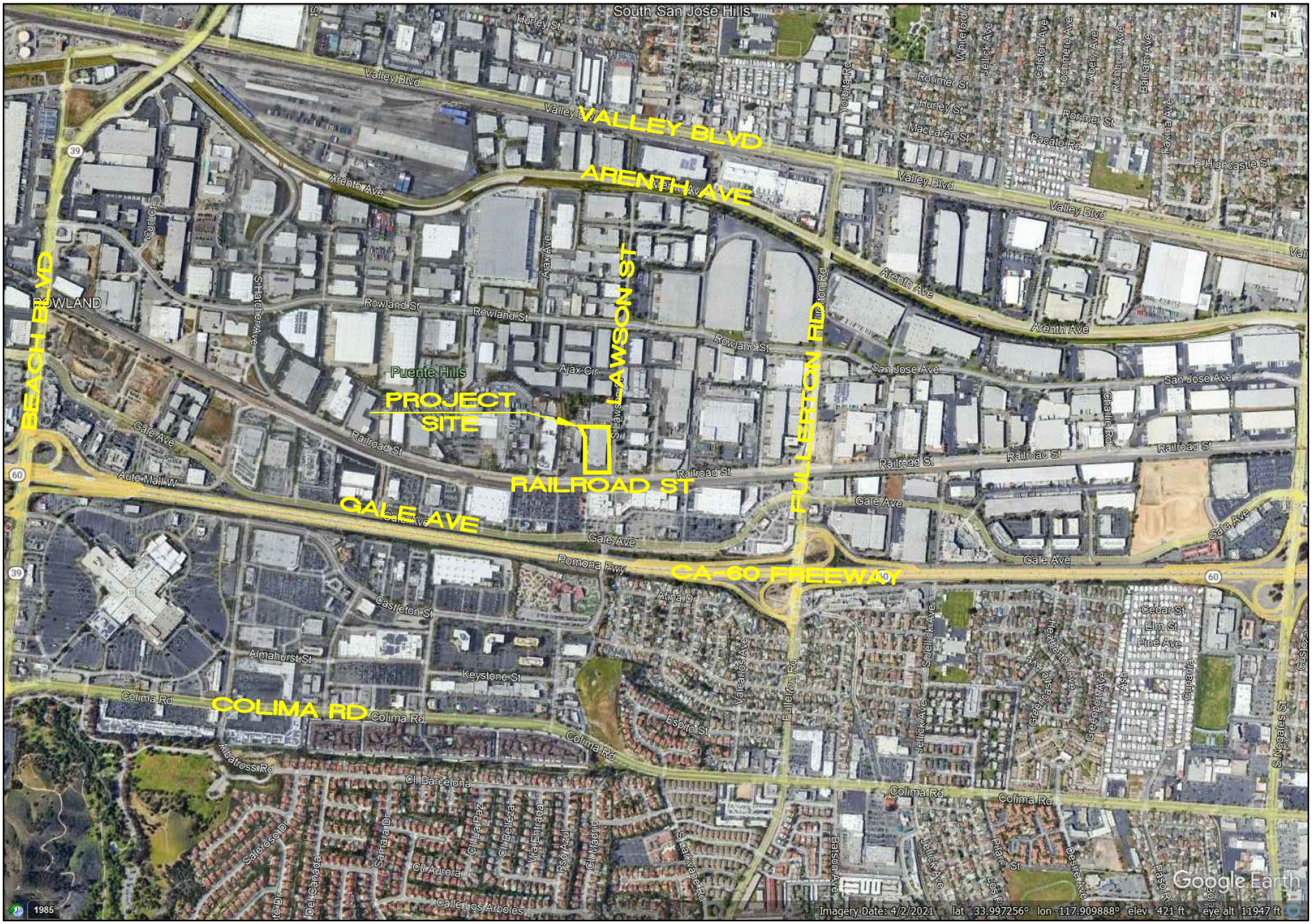


	3/4"	#4	#30	#200		SE
Course	90	35	10	2		25
Base	100	100	37	3.0		0
Fine	100	60	30	9		35

COMMENTS:

APPENDIX B

LID Site Plan



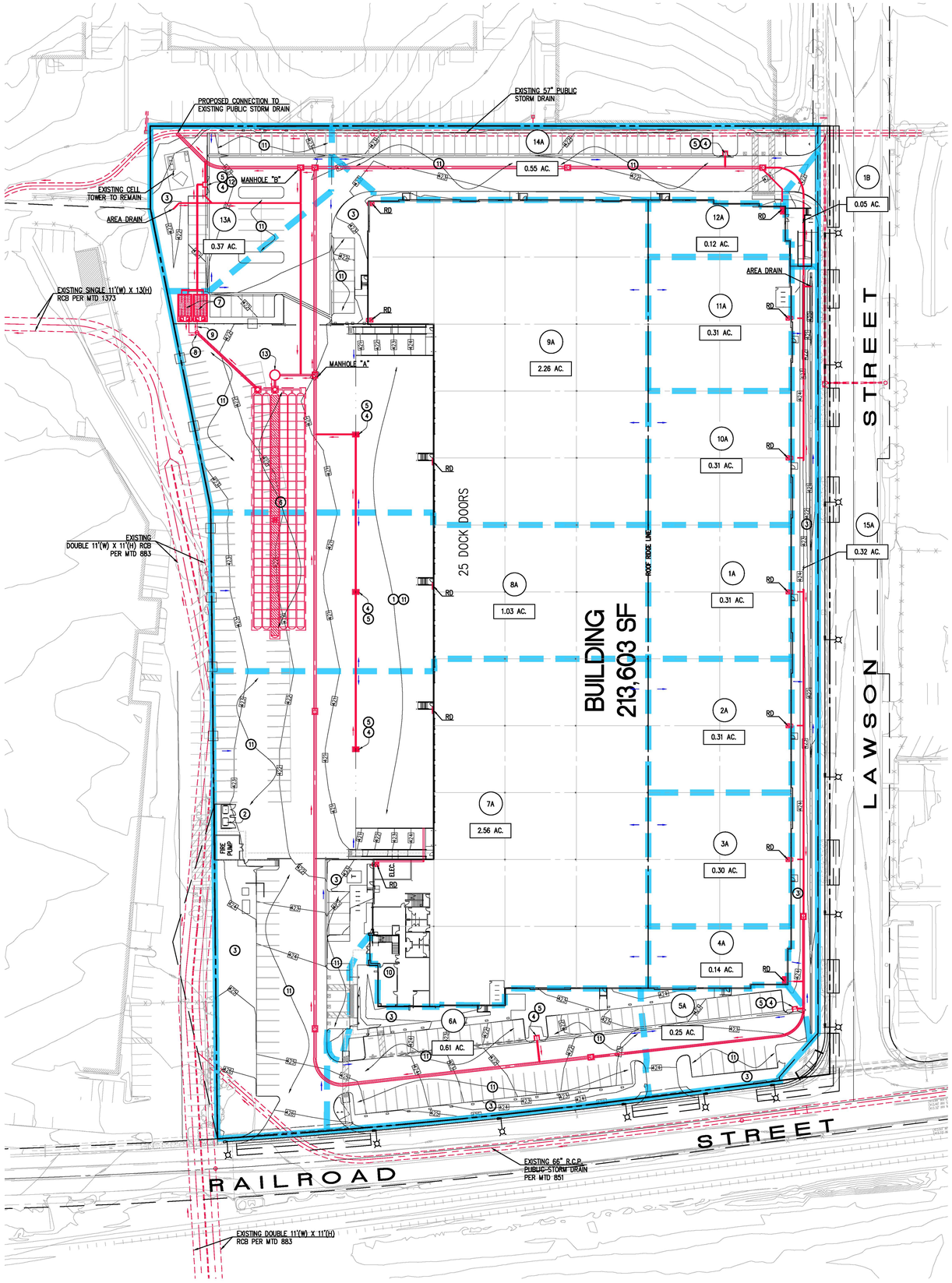
Last Update: 1/22/24
O:\4100-4199\4186\4186VicMap.dwg

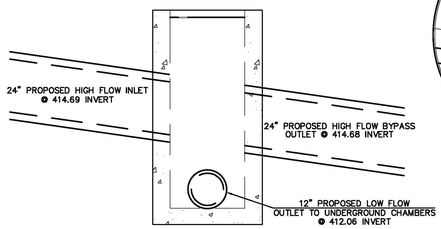
VICINITY MAP

FOR

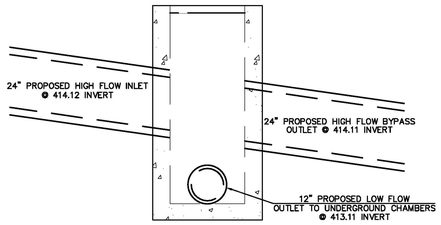
17969 RAILROAD STREET
CITY OF INDUSTRY, CA

Thienes Engineering, Inc.
CIVIL ENGINEERING • LAND SURVEYING
14349 FIRESTONE BOULEVARD
LA MIRADA, CALIFORNIA 90638
PH.(714)521-4811 FAX(714)521-4173

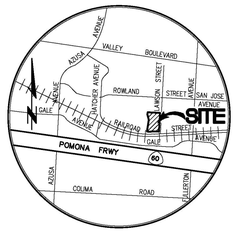




DIVERSION MANHOLE "A"
N.T.S.



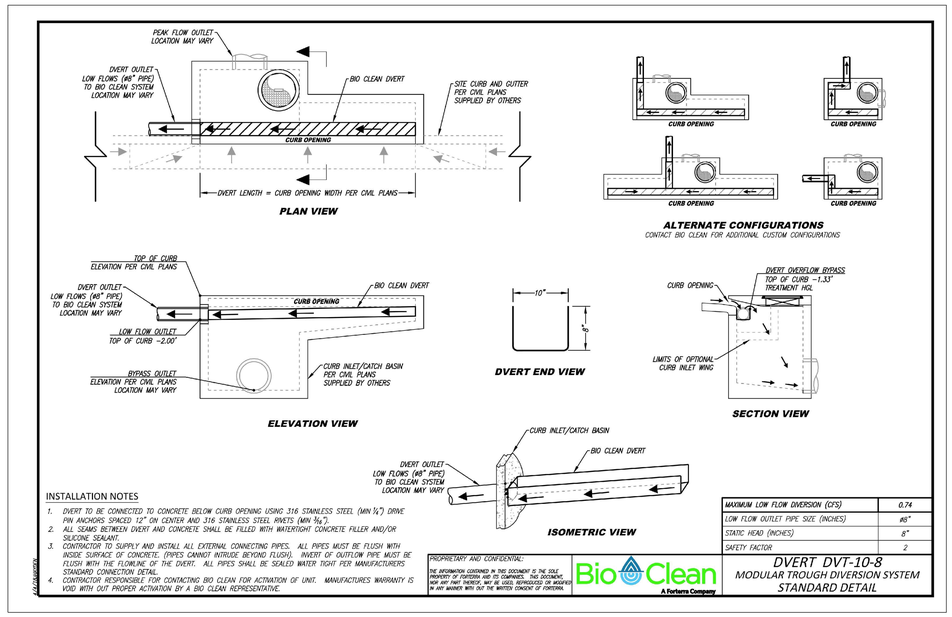
DIVERSION MANHOLE "B"
N.T.S.



LEGEND

1. N13 – ABOVEGROUND LOADING DOCK (S-4)
2. TRASH ENCLOSURE (S-3)
3. N3 – LANDSCAPE MANAGEMENT/ EFFICIENT IRRIGATION (S-8)
4. N4 & N14 – CATCH BASIN INSPECTION
5. N4 – STORM DRAIN SYSTEM SIGNS (S-1) "NO DUMPING-DRAINS TO OCEAN"
6. N4 – STORMTECH MC-3500 DETENTION CHAMBERS W/ IMPERMEABLE LINER
7. N4 – PROPRIETARY BIOFILTRATION UNIT
8. N4 – SUMP PUMP
9. FORCE MAIN
10. N1, N2, N7 & N12 – EDUCATIONAL MATERIALS, ACTIVITY RESTRICTION, SPILL CONTINGENCY PLAN & CONTRACTOR/EMPLOYEE TRAINING
11. N11 & N15 – AREA LITTER CONTROL & SWEEPING
12. CONTECH DVERT
13. N-4 – ADS BARRACUDA HYDRODYNAMIC SEPARATOR

NOTES:
RD ROOF DRAIN
BOUNDARY
DRAINAGE AREAS
SURFACE FLOW LINE
SD FLOW LINE



INSTALLATION NOTES

1. DVERT TO BE CONNECTED TO CONCRETE BELOW CURB OPENING USING 316 STAINLESS STEEL (MIN ¼") DRIVE PIN ANCHORS SPACED 12" ON CENTER AND 316 STAINLESS STEEL RIVETS (MIN 3/16").
2. ALL SEAMS BETWEEN DVERT AND CONCRETE SHALL BE FILLED WITH WATERTIGHT CONCRETE FILLER AND/OR SILICONE SEALANT.
3. CONTRACTOR TO SUPPLY AND INSTALL ALL EXTERNAL CONNECTING PIPES. ALL PIPES MUST BE FLUSH WITH INSIDE SURFACE OF CONCRETE. (PIPES CANNOT INTRUDE BEYOND FLUSH). INVERT OF OUTFLOW PIPE MUST BE FLUSH WITH THE FLOWLINE OF THE DVERT. ALL PIPES SHALL BE SEALED WATER TIGHT PER MANUFACTURERS STANDARD CONNECTION DETAIL.
4. CONTRACTOR RESPONSIBLE FOR CONTACTING BIO CLEAN FOR ACTIVATION OF UNIT. MANUFACTURES WARRANTY IS VOID WITH OUT PROPER ACTIVATION BY A BIO CLEAN REPRESENTATIVE.

MAXIMUM LOW FLOW DIVERSION (CFS)	0.74
LOW FLOW OUTLET PIPE SIZE (INCHES)	#8"
STATIC HEAD (INCHES)	8"
SAFETY FACTOR	2

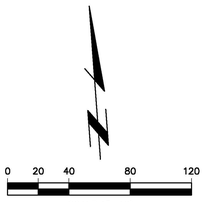
PROPRIETARY AND CONFIDENTIAL:
THE INFORMATION CONTAINED IN THIS DOCUMENT IS THE SOLE PROPERTY OF FORTERRA AND ITS COMPANIES. THIS DOCUMENT, NOR ANY PART THEREOF, MAY BE USED, REPRODUCED OR MODIFIED IN ANY MANNER WITH OUT THE WRITTEN CONSENT OF FORTERRA.

Bio Clean — A Forterra Company

DVERT DVT-10-8
MODULAR TROUGH DIVERSION SYSTEM
STANDARD DETAIL

SAMPLE STENCIL TO BE USED NEAR GRATE AND CURB OPENING INLETS

SAMPLE CATCH BASIN STENCIL



PREPARED FOR:
17969 RAILROAD ST OWNER, LLC c/o ROCKPOINT
3953 MAPLE AVENUE, SUITE 300
DALLAS, TX 75219
PHONE: (972) 934-0100

PREPARED BY:
Thienes Engineering, Inc.
CIVIL ENGINEERING • LAND SURVEYING
14349 FIRESTONE BOULEVARD
LA MIRADA, CALIFORNIA 90638
PH:(714)521-4811 FAX:(714)521-4173

Designed by _____ Date _____
Checked by _____ Date _____
Designed by _____ Date _____
Checked by _____ Date _____
Approved by _____ Date _____
Public Works Director _____ R.C.E. _____

Sheet 1 of 3 Sheets

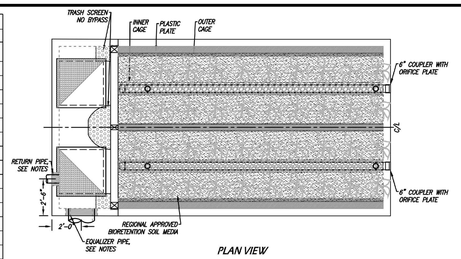
Last Update: 1/24/24
G:\4100-4199\4186\4186MP\SITEMAP.dwg

CITY OF INDUSTRY
PUBLIC WORKS DEPARTMENT

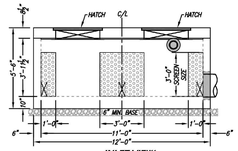
LID SITE MAP
RAILROAD STREET INDUSTRIAL BUILDING
17969 RAILROAD STREET

4186/1 OF 3 SHEETS

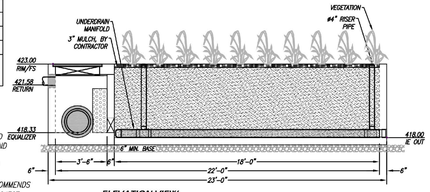
SITE SPECIFIC DATA			
PROJECT ID		776101-010	
PROJECT NAME		RAILROAD STREET INDUSTRIAL BUILD, TEI 4816	
PROJECT LOCATION		CITY OF INDUSTRY, CA	
STRUCTURE ID		WM #1	
TREATMENT REQUIRED			
VOLUME BASED (CF)		FLOW BASED (CFS)	
23774 OF 47,547		----	
TREATMENT HGL AVAILABLE (FT)			----
PEAK BYPASS REQUIRED (CFS) – IF APPLICABLE			OFFLINE
PIPE DATA	I.E.	MATERIAL	DIAMETER
RETURN PIPE	421.58	HDPE	6"
EQUALIZER PIPE	418.33	HDPE	18"
OUTLET PIPE	418.00	PVC-SDR35	6"
	PRETREATMENT	BIOFILTRATION	N/A
RIM ELEVATION	423.00	423.00	N/A
SURFACE LOAD	PEDESTRIAN	OPEN PLANTER	N/A
FRAME & COVER	(2) 36"X36"	N/A	N/A
LA COUNTY MEDIA MIX VOLUME (CY)			26.56
GRAVEL LAYER WITHIN MEDIA CHAMBER (CY)			5.56
ORIFICE DIAMETER (IN)			ø0.83"
NOTES: PRELIMINARY, NOT FOR CONSTRUCTION.			



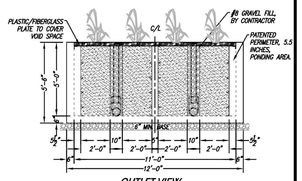
PLAN VIEW



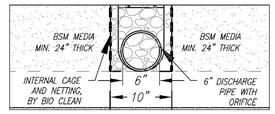
INLET VIEW



ELEVATION VIEW



OUTLET VIEW



INTERNAL CAGE DETAILS

REQUIRED HORIZ. MEDIA THICKNESS (INCHES)	24
TREATMENT VOLUME (CF)	23774
TARGETED DRAINDOWN DURATION (HR)	96
WETLANDMEDIA INFILTRATION RATE (IN/HR)	12
OR	
WETLANDMEDIA LOADING RATE (GPM/SF)	0.12
DISCHARGE RATE (CFS)	0.069
REQUIRED TOTAL MEDIA SURFACE AREA (SF)	257.28
PROVIDED TOTAL MEDIA SURFACE AREA (SF)	129.00
NUMBER OF ROW(S)	2

INSTALLATION NOTES

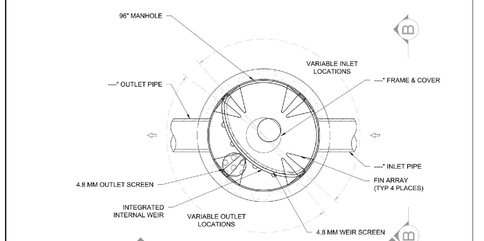
1. CONTRACTOR TO PROVIDE ALL LABOR, EQUIPMENT, MATERIALS AND INCIDENTALS REQUIRED TO OFFLOAD AND INSTALL THE SYSTEM AND APPURTENANCES IN ACCORDANCE WITH THIS DRAWING AND THE MANUFACTURER'S SPECIFICATIONS, UNLESS OTHERWISE STATED IN MANUFACTURER'S CONTRACT.
2. UNIT MUST BE INSTALLED ON LEVEL BASE. MANUFACTURER RECOMMENDS A MINIMUM 6" LEVEL ROCK BASE UNLESS SPECIFIED BY THE PROJECT ENGINEER. CONTRACTOR IS RESPONSIBLE FOR VERIFYING PROJECT ENGINEER'S RECOMMENDED BASE SPECIFICATIONS.
3. ALL PIPES MUST BE FLUSH WITH INSIDE SURFACE OF CONCRETE. (PIPES CANNOT INTRUDE BEYOND FLUSH). INVERT OF OUTFLOW PIPE MUST BE FLUSH WITH DISCHARGE CHAMBER FLOOR. ALL GAPS AROUND PIPES SHALL BE SEALED WATER TIGHT WITH A NON-SHRINK GROUT PER MANUFACTURER'S STANDARD CONNECTION DETAIL AND SHALL MEET OR EXCEED REGIONAL PIPE CONNECTION STANDARDS.
4. CONTRACTOR TO SUPPLY AND INSTALL ALL EXTERNAL CONNECTING PIPES.
5. CONTRACTOR RESPONSIBLE FOR INSTALLATION OF ALL RISERS, MANHOLES, AND HATCHES. CONTRACTOR TO USE GROUT AND/OR BRICKS TO MATCH COVERS WITH FINISHED SURFACE UNLESS SPECIFIED OTHERWISE.
6. DRIP OR SPRAY IRRIGATION REQUIRED ON ALL UNITS WITH VEGETATION.

GENERAL NOTES

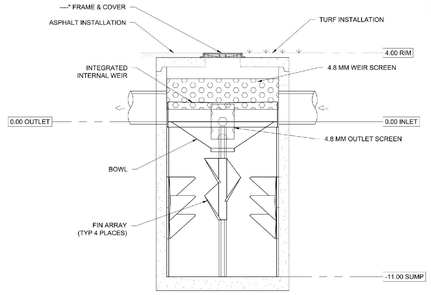
1. MANUFACTURER TO PROVIDE ALL MATERIALS UNLESS OTHERWISE NOTED.
2. ALL DIMENSIONS, ELEVATIONS, SPECIFICATIONS AND CAPACITIES ARE SUBJECT TO CHANGE. FOR PROJECT SPECIFIC DRAWINGS DETAILING EXACT DIMENSIONS, WEIGHTS AND ACCESSORIES PLEASE CONTACT MANUFACTURER.

CONTECH ENGINEERED SOLUTIONS LLC
www.ContechES.com

WetlandMOD-11'-22'-5'-0"-V
STORMWATER BIOFILTRATION SYSTEM
STANDARD DETAIL

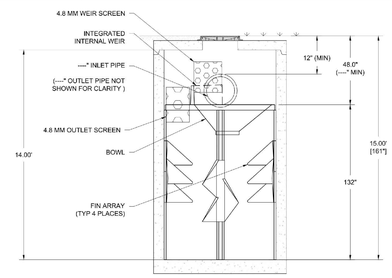


PLAN VIEW
NTS



SECTION VIEW A-A
NTS

BARRACUDA S8	
UNIT ID	
PEAK FLOW RATE (CFS)	
TREATMENT FLOW RATE (CFS)	



SECTION VIEW B-B
NTS

REV	DWN	CKD	DESCRIPTION

BARRACUDA S8
STANDARD DETAIL
DATE: 12/18/17 DRAWN: EKH
PROJECT #: ---- CHECKED: ----

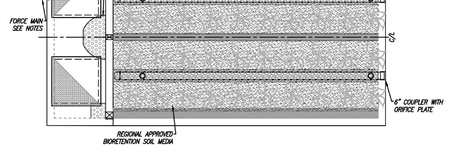
THIS DRAWING AND SPECIFICATION, OR ANY COPY THEREOF, AS WELL AS THE BUILDING OR OTHER STRUCTURE OR PART THEREOF TO WHICH THIS DRAWING OR SPECIFICATION MAY PERTAIN, IS THE PROPERTY OF ADS AND SHALL NOT BE USED FOR ANY PURPOSE WHATSOEVER WITHOUT THE EXPRESS WRITTEN PERMISSION OF ADS. IN THE EVENT OF UNAUTHORIZED REUSE, THE RIGHTS OF ADS SHALL BE PROTECTED TO THE FULLEST EXTENT PERMITTED BY LAW. BY TAKING ANY ACTION WITH RESPECT TO THIS DRAWING OR SPECIFICATION, THE RECIPIENT OR USER AGREES TO BE BOUND BY THE FOREGOING STATEMENT.

ADS
4640 TRUEMAN BLVD
HILLIARD, OH 43026

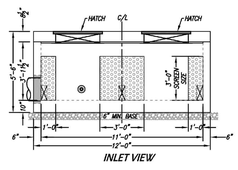
NOT TO SCALE

SHEET 1 OF 1

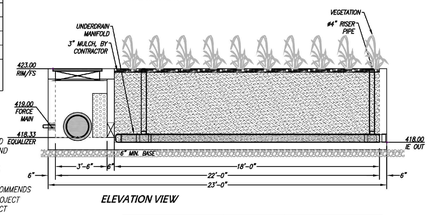
SITE SPECIFIC DATA			
PROJECT ID		776101-015	
PROJECT NAME		RAILROAD STREET INDUSTRIAL BUILD, TEI 4186	
PROJECT LOCATION		CITY OF INDUSTRY, CA	
STRUCTURE ID		WM #2	
TREATMENT REQUIRED			
VOLUME BASED (CF)		FLOW BASED (CFS)	
23774 OF 47,547		----	
TREATMENT HGL AVAILABLE (FT)			----
PEAK BYPASS REQUIRED (CFS) – IF APPLICABLE			OFFLINE
PIPE DATA	I.E.	MATERIAL	DIAMETER
FORCE MAIN	419.00	PVC	3"
EQUALIZER PIPE	418.33	HDPE	18"
OUTLET PIPE	418.00	PVC-SDR35	6"
	PRETREATMENT	BIOFILTRATION	N/A
RIM ELEVATION	423.00	423.00	N/A
SURFACE LOAD	PEDESTRIAN	OPEN PLANTER	N/A
FRAME & COVER	(2) 36"X36"	N/A	N/A
LA COUNTY MEDIA MIX VOLUME (CY)			26.56
GRAVEL LAYER WITHIN MEDIA CHAMBER (CY)			5.56
ORIFICE DIAMETER (IN)			ø0.83"
NOTES: PRELIMINARY, NOT FOR CONSTRUCTION.			



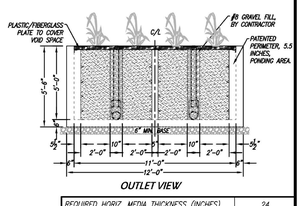
PLAN VIEW



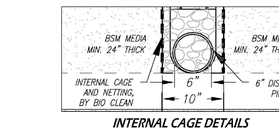
INLET VIEW



ELEVATION VIEW



OUTLET VIEW



INTERNAL CAGE DETAILS

REQUIRED HORIZ. MEDIA THICKNESS (INCHES)	24
TREATMENT VOLUME (CF)	23774
TARGETED DRAINDOWN DURATION (HR)	96
WETLANDMEDIA INFILTRATION RATE (IN/HR)	12
OR	
WETLANDMEDIA LOADING RATE (GPM/SF)	0.12
DISCHARGE RATE (CFS)	0.069
REQUIRED TOTAL MEDIA SURFACE AREA (SF)	257.28
PROVIDED TOTAL MEDIA SURFACE AREA (SF)	129.00
NUMBER OF ROW(S)	2

INSTALLATION NOTES

1. CONTRACTOR TO PROVIDE ALL LABOR, EQUIPMENT, MATERIALS AND INCIDENTALS REQUIRED TO OFFLOAD AND INSTALL THE SYSTEM AND APPURTENANCES IN ACCORDANCE WITH THIS DRAWING AND THE MANUFACTURER'S SPECIFICATIONS, UNLESS OTHERWISE STATED IN MANUFACTURER'S CONTRACT.
2. UNIT MUST BE INSTALLED ON LEVEL BASE. MANUFACTURER RECOMMENDS A MINIMUM 6" LEVEL ROCK BASE UNLESS SPECIFIED BY THE PROJECT ENGINEER. CONTRACTOR IS RESPONSIBLE FOR VERIFYING PROJECT ENGINEER'S RECOMMENDED BASE SPECIFICATIONS.
3. ALL PIPES MUST BE FLUSH WITH INSIDE SURFACE OF CONCRETE. (PIPES CANNOT INTRUDE BEYOND FLUSH). INVERT OF OUTFLOW PIPE MUST BE FLUSH WITH DISCHARGE CHAMBER FLOOR. ALL GAPS AROUND PIPES SHALL BE SEALED WATER TIGHT WITH A NON-SHRINK GROUT PER MANUFACTURER'S STANDARD CONNECTION DETAIL AND SHALL MEET OR EXCEED REGIONAL PIPE CONNECTION STANDARDS.
4. CONTRACTOR TO SUPPLY AND INSTALL ALL EXTERNAL CONNECTING PIPES.
5. CONTRACTOR RESPONSIBLE FOR INSTALLATION OF ALL RISERS, MANHOLES, AND HATCHES. CONTRACTOR TO USE GROUT AND/OR BRICKS TO MATCH COVERS WITH FINISHED SURFACE UNLESS SPECIFIED OTHERWISE.
6. DRIP OR SPRAY IRRIGATION REQUIRED ON ALL UNITS WITH VEGETATION.

GENERAL NOTES

1. MANUFACTURER TO PROVIDE ALL MATERIALS UNLESS OTHERWISE NOTED.
2. ALL DIMENSIONS, ELEVATIONS, SPECIFICATIONS AND CAPACITIES ARE SUBJECT TO CHANGE. FOR PROJECT SPECIFIC DRAWINGS DETAILING EXACT DIMENSIONS, WEIGHTS AND ACCESSORIES PLEASE CONTACT MANUFACTURER.

CONTECH ENGINEERED SOLUTIONS LLC
www.ContechES.com

WetlandMOD-11'-22'-5'-0"-V
STORMWATER BIOFILTRATION SYSTEM
STANDARD DETAIL

StormTech® MC-3500 Chamber

Designed to meet the most stringent industry performance standards for superior structural integrity while providing designers with a cost-effective method to save valuable land and protect water resources. The StormTech system is designed primarily to be used under parking lots, thus maximizing land usage for private (commercial) and public applications. StormTech chambers can also be used in conjunction with Green Infrastructure, thus enhancing the performance and extending the service life of these practices.

Nominal Chamber Specifications
(not to scale)

Size (L x W x H)
90" x 77" x 45"
2286 mm x 1956 mm x 1143 mm

Chamber Storage
109.9 ft³ (3.11 m³)

Min. Installed Storage*
175.0 ft³ (4.96 m³)

Weight
134 lbs (60.8 kg)

Shipping
15 chambers/pallet
7 end caps/pallet
7 pallets/truck

Nominal End Cap Specifications
(not to scale)

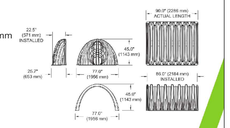
Size (L x W x H)
26.5" x 71" x 45.1"
673 mm x 1803 mm x 1145 mm

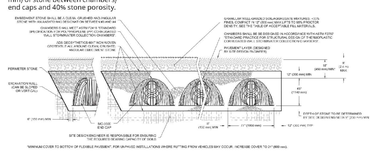
End Cap Storage
14.9 ft³ (0.42 m³)

Min. Installed Storage*
45.1 ft³ (1.28 m³)

Weight
49 lbs (22.2 kg)

*Assumes a minimum of 12" (300 mm) of stone above, 9" (230 mm) of stone below chambers, 6" (150 mm) of stone between chambers/ end caps and 40% stone porosity.





*MINIMUM ACCESS TO BOTTOM OF FLEXIBLE PAVEMENT. FOR UNPAVED INSTALLATIONS WHERE PUTTING FROM VEHICLES MAY OCCUR, INCREASE COVER TO 24" (600 mm).

ADS StormTech

StormTech MC-3500 Specifications

Storage Volume Per Chamber

	Bare Chamber Storage ft³ (m³)	Chamber and Stone Foundation Depth in. (mm)			
		9 in (230 mm)	12 in (300 mm)	15 in (375 mm)	18 in (450 mm)
Chamber	109.9 (3.11)	175.0 (4.96)	179.9 (5.09)	184.9 (5.24)	189.9 (5.38)
End Cap	14.9 (0.42)	45.1 (1.28)	46.6 (1.32)	48.3 (1.37)	49.9 (1.41)

Note: Assumes 6" (150 mm) row spacing, 40% stone porosity, 12" (300 mm) stone above and includes the bare chamber/end cap volume.

Amount of Stone Per Chamber

English Tons (yds³)	Stone Foundation Depth			
	9 in	12 in	15 in	18 in
Chamber	8.5 (6.0)	9.1 (6.5)	9.7 (6.9)	10.4 (7.4)
End Cap	3.9 (2.8)	4.1 (2.9)	4.3 (3.1)	4.5 (3.2)
Metric Kilograms (m³)	230 mm	300 mm	375 mm	450 mm
Chamber	7711 (4.4)	8255 (5.0)	8809 (5.3)	9435 (5.7)
End Cap	3538 (2.1)	3719 (2.2)	3901 (2.4)	4082 (2.5)

Note: Assumes 12" (300 mm) of stone above and 6" (150 mm) row spacing and 6" (150 mm) of perimeter stone in front of end caps.

Volume Excavation Per Chamber yd³ (m³)

	Stone Foundation Depth			
	9 in (230 mm)	12 in (300 mm)	15 in (375mm)	18 in (450 mm)
Chamber	11.9 (9.1)	12.4 (9.5)	12.8 (9.8)	13.3 (10.2)
End Cap	4.0 (3.1)	4.1 (3.3)	4.3 (3.3)	4.4 (3.4)

Note: Assumes 6" (150 mm) of separation between chamber rows and 24" (600 mm) of cover. The volume of excavation will vary as depth of cover increases.

ADS StormTech products, manufactured in accordance with ASTM F2418 or ASTMF2922, comply with all requirements in the Build America, Buy America (BABA) Act.

Working on a project?
Visit us at adspipe.com/stormtech and utilize the Design Tool

ADS StormTech

adspipe.com
800-821-6710

Last Updated: 1/24/24
D:\4100-4199\4186\4186MP\SITEMAP.dwg

CITY OF INDUSTRY
PUBLIC WORKS DEPARTMENT

LID SITE MAP

RAILROAD STREET INDUSTRIAL BUILDING

17969 RAILROAD STREET

4186/2 OF 3 SHEETS

PREPARED FOR:
17969 RAILROAD ST OWNER, LLC c/o ROCKPOINT
3953 MAPLE AVENUE, SUITE 300
DALLAS, TX 75219
PHONE: (972) 934-0100

PREPARED BY:
Thienes Engineering, Inc.
CIVIL ENGINEERING * LAND SURVEYING
14349 FIRESTONE BOULEVARD
LA MIRADA, CALIFORNIA 90638
PH.(714)521-4811 FAX(714)521-4173

Designed by _____ Date _____
Checked by _____ Date _____
Designed by _____ Date _____
Checked by _____ Date _____

Approved by _____ Date _____
Public Works Director _____ R.C.E. _____

Sheet 2 of 3 Sheets

PACKAGED STORM PUMP LIFT STATION
RAILROAD ST INDUSTRIAL BUILDING

Furnish and install complete pre-packaged duplex Lift Station model **#PSI-THI062623-R2** as manufactured by Pacific Southwest Industries (national phone # 800-358-9095)

This pre-packaged Lift Station shall incorporate a quick removal system manufactured by the pump manufacturer. The pump(s) shall be guided to the discharge base elbow by a single or double guide rail and shall be stainless steel and shall extend from the discharge base elbow to the upper guide bracket mounted on 1-5/8" x 1-5/8" channel strut just below the basin cover. Stainless steel lifting chain or cable shall be supplied and properly installed to remove the pump from the wet well. The internal discharge piping shall be completely pre-plumbed with pressure rated schedule 40 or 80 PVC pipe as indicated and extend 12" beyond the wet well and valve vault side wall for contractor connection to the force main piping. The pump(s) discharge piping shall have a check and ball valve installed on each pump discharge. The Lift Station shall include control panel and level control floats. The control panel shall be suitable for surface mounting or free standing on a leg kit if the site conditions require it.

PUMP(S):
Furnish and install Liberty series LE submersible pump(s). Each unit shall be capable of handling residential sewage with 2" solid handling capability. The submersible pumps shall produce the proper head and flow as indicated in this detail. The pump(s) shall be designed so that the shaft power required (BHP) shall not exceed the motor rated output throughout the entire operating range of the pump performance curve. A two-year warranty "out of the box" shall be standard.

CONSTRUCTION:
Each centrifugal sewage pump shall be the certified Series LE SERIES pumps as manufactured by Liberty Pumps, Bergen NY. The castings shall be constructed of class 25 cast iron. The motor housing shall be oil filled to dissipate heat. Air filled motors shall not be considered equal since they do not properly dissipate heat from the motor. All mating parts shall be machined and sealed with a Buna-N O-ring. All fasteners exposed to the liquid shall be stainless steel. The motor shall be protected on the top side with sealed cord entry plate with molded pins to conduct electricity eliminating the ability of water to enter internally through the cord. The motor shall be protected on the lower side with a unitized ceramic/carbon seal with stainless steel housings and spring. The upper and lower bearing shall be capable of handling all radial and thrust loads. The pump shall be furnished with stainless steel handle.

ELECTRICAL POWER CORD:
The submersible pump shall be supplied with 35 feet of multi-conductor power cord. It shall be cord type SJTW (1-PH), capable of continued exposure to the pumped liquid. The power cord shall be sized for the rated full load amps of the pump in accordance with the National Electric Code. The power cable shall not enter the motor housing directly but will conduct electricity to the motor by means of a water tight compression fitting cord plate assembly, with molded pins to conduct electricity. This will eliminate the ability of water to enter internally through the cord, by means of a damaged or wicking cord.

MOTORS:
Single phase motors shall be oil filled, permanent split capacitor, and class B insulated NEMA B design rated for continuous duty. Three phase motors shall be oil filled; class B insulated NEMA B design, rated for continuous duty. At maximum load the winding temperature shall not exceed 130 degrees C unsubmerged. Since air filled motors are not capable of dissipating heat, they shall not be considered equal. Single phase pump motors shall have an integral thermal overload switch in the windings for protecting the motor. Three phase motors shall be used with an appropriate controller with integral overload protection. The capacitor circuit shall be mounted internally in the pump on single phase units.

BEARINGS AND SHAFT:
Upper and lower ball bearings shall be required. The bearings shall be a single ball / race type bearing. Both bearings shall be permanently lubricated by the oil, which fills the motor housing. The motor shaft shall be made of 300 or 400 series stainless steel and have a minimum diameter of .50".

SEALS:
The pump shall have a unitized carbon / ceramic seal with stainless steel housings and spring equal to Crane Type 6A. The motor plate / housing interface shall be sealed with a Buna-N O-ring.

IMPELLER:
The impeller shall be a class 25 iron, with pump out vanes on the back shroud to keep debris away from the seal area. It shall be threaded to the motor shaft.

QUICK REMOVAL SYSTEM:
The pumping unit(s) shall be equipped with quick removal system (QRS). The construction shall be such that the pump(s) will automatically connect to the discharge piping when lowered into place on the discharge connector. There shall be no need for personnel to enter the wet well to accomplish installation or removal of the pump(s). The pumping unit(s) shall be fitted with stainless steel lifting chain(s) of sufficient length and strength to permit the raising and lowering of the unit(s). The chain(s) shall be fastened at the top of the structure near the access opening. The need for a protective coating shall not be required. A sliding guide bracket shall be an integral part of the pumping unit and the pump casing shall have a machined connection with a bracket to connect with the discharge connection. Sealing of the pumping unit to the discharge connection shall be accomplished by a single linear downward motion of the pump with the entire weight of the pumping unit guided by a pawl, thereby wedging the pumping unit tightly against the discharge connector. No portion of the pump shall bear directly on the floor of the sump nor shall a rotary motion of the pump be required for sealing. All fasteners coming into contact with the pumpage shall be stainless steel. Two corrosion resistant guide pipes shall be furnished and installed for each pump to permit raising and lowering of the pump.

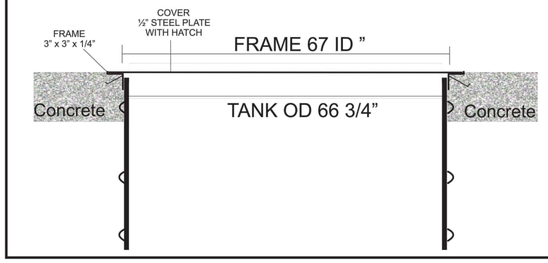
FIBERGLASS WET WELL:
The fiberglass wet well with an anti-flotation flange shall have the proper diameter and depth below the lowest inlet to promote proper cycling while maintaining the rim at grade. The fiberglass wet well shall be manufactured using a process that is filament wound and or chopped spray. The wet well shall be constructed with a anti flotation flange. Lifting lugs shall be required for those wet wells 48 inches in diameter and larger for setting of the wet well. The laminate shall have a Barco hardness of at least 90% of the resin manufactures minimum specified hardness for cured resin on both the interior and exterior surfaces. The minimum wall thickness of the wet well shall not be less than 1/4". Stainless steel studs will be encapsulated in the bottom of the wet well to allow the mounting of the quick removal system. The top rim flange will be a minimum of 2" wide to allow for the installation of the pedestrian rated aluminum cover to the rim flange or shall be rimless if the cover is specified for H20 off street locations. The wet well shall be provided with "unseal" fittings that can be installed in the field to insure proper elevation of the inlet, vent, and electrical on the side of the wet well. The wet well will house 2 - swing check valves, and 2 – shut off valves.

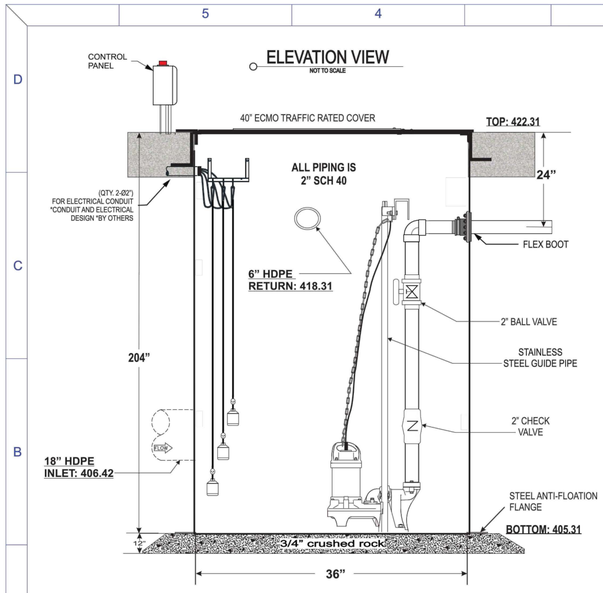
COVER(s)
The wet well cover shall always be gasketed and bolted to the rim flange of the fiber glass tank using 7/16" stainless steel hex head bolts unless the cover is to be in a H20 off street location. The type of material to be used for the cover shall be as indicated on this plan sheet.

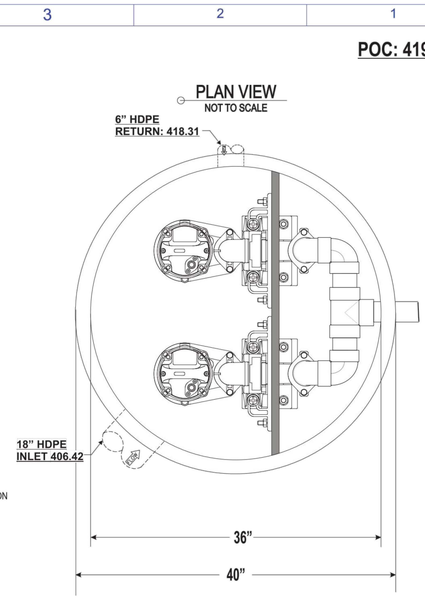
DUPLEX ALTERNATING CONTROL PANEL:
The duplex control panel, as a minimum, shall include the appropriate enclosure type for the environment it is to be installed in and should include the following: Motor starters, motor circuit protectors or variable frequency drives (VFD), pump run indicator(s), operation selector switch(es), high water alarm and light, silence switch, dry contact for alarm, numbered terminals for all incoming power, pump motor(s) and level controls. The control panel shall be UL listed 508 or 913.

FITTING THE TRAFFIC FRAME AND COVER

The frame and cover is meant to telescope around the OD of the tank. This will allow you to float the cover to grade and will insure the frame does not rest on the fiberglass tank. PSI suggests setting the tank approximately 1.5" lower than the finish surface to allow for the installation of the frame and cover as stated above. Concrete is recommended to be poured at least 8" thick and 24" wide around the frame and tank to support the traffic loads. Sizes and dimensions are for example and will differ from site to site.







FLOAT ELEVATIONS	
LAG/ALARM	415.00'
ON	407.00'
OFF	406.31'

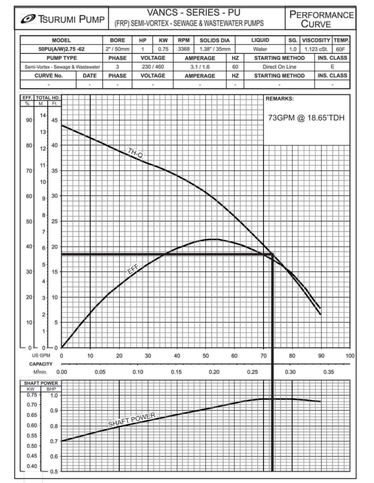
PUMP MODEL: 50PU2.75
1 HP 460V 3 PH FLA 1.6 AMP
PERFORMANCE:
73 GPM AT 18.65 FT TDH

NOTES: :
1. CONDUIT INSTALLED IN FIELD TO CONTROL PANEL- *PROVIDED BY OTHERS-
2. CONDUIT, ELECTRICAL DESIGN , INSTALLATION BY OTHERS, PSI WILL PROVIDE ELECTRICAL RUBBER GROMMETS SHIPPED LOOSE FOR FIELD INSTALLATION BY OTHERS-
3. (QTY 2) 2" CONDUIT, (1) FOR POWER,(1) FOR LEVEL SENSING
4. *G.C OR OTHERS TO COORDINATE CONTROL PANEL LOCATION WITH UNDERGROUND ELECTRICAL SERVICE TO FIBERGLASS WET WELL WITHIN SPECIFIC 50 FT CABLE LENGTHS.

PSI Pacific Southwest Industries
ENGINEERED- PUMPS/PUMP LIFT STATIONS & DISPOSAL SYSTEMS
PACKAGED LIFT STATION
(800)-358-9095

LIFT STATION PROFILE & CALCULATIONS						
2" SCH 40 = 2.06 SCH 80 = 1.94						
2" PVC PIPE	(QTY)	21	x	1 FT	21 FT	
2" PVC 90 ELBOW	(QTY)	1	x	5.2 FT	5.2 FT	
2" PVC 45 BEND	(QTY)	0	x	2.8 FT	0 FT	
2" PVC TEE	(QTY)	1	x	13.8 FT	13.8 FT	
2" BALL VALVE	(QTY)	1	x	1.4 FT	1.4 FT	
2" CHECK VALVE	(QTY)	1	x	13 FT	13 FT	
TOTAL EQUIVALENT LENGTH					54.4 FT	
FRICTION LOSS PER 100 FT 2" PVC	73 GPM	8.2 FT		PER 100 FT		
FRICTION LOSS 2"	54.4	/ 100	x	8.2 FT	4.49 FT	
TOTAL DYNAMIC HEAD						
2" FRICTION LOSS					4.49 FT	
STATIC HEAD				+	14.16 FT	
PERFORMANCE	73 GPM @	18.65	FT TDH THROUGH 2" PVC LINE			

HAZEN-WILLIAMS EQUATION/HEAD LOSS IN WATER PIPE	
$(f) = 0.2083\ (100 / c)^{1.852}\ q^{1.852} / dh^{4.8655}$	
c=	150 HDPE / PVC
q=	73 GPM
dh=	2" SCH 40 = 2.06
FRICTION LOSS PER 100 FT f=	8.25
Velocity (ft/s) =	7.03



No.	Description	Date

STORM PUMP SYSTEM

NOTE: VERIFY ALL ELEVATIONS PRIOR TO FABRICATION, OTHERS TO VERIFY ALL INLET/OUTLET ORIENTATIONS PRIOR TO FABRICATION AND INSTALLATION. ALL PIPE OPENINGS AND SEALING SHALL BE COMPLETED IN FIELD BY OTHERS.

PSI Pacific Southwest Industries
ENGINEERED- PUMPS/PUMP LIFT STATIONS & DISPOSAL SYSTEMS
16141 COLLIER AVE., LAKE ELSINORE, CA 92530 PH: 800 358-9095

LIFT STATION DETAILS
RAILROAD ST INDUSTRIAL BUILDING

Scale: NTS
Sheet No. 1 OF 1
Date: 06/26/23
Drawn by: EM
Checked by:

LSD-1

Last Updated:1/24/24
D:\4100-4199\4186\4186MPSITEMAP.dwg

CITY OF INDUSTRY
PUBLIC WORKS DEPARTMENT

LID SITE MAP

RAILROAD STREET INDUSTRIAL BUILDING

17969 RAILROAD STREET

4186/3 OF 3 SHEETS

PREPARED FOR:
17969 RAILROAD ST OWNER, LLC c/o ROCKPOINT
3953 MAPLE AVENUE, SUITE 300
DALLAS, TX 75219
PHONE: (972) 934-0100

PREPARED BY:
Thienes Engineering, Inc.
CIVIL ENGINEERING * LAND SURVEYING
14349 FIRESTONE BOULEVARD
LA MIRADA, CALIFORNIA 90638
PH:(714)521-4811 FAX(714)521-4173

Designed by _____ Date _____
Checked by _____ Date _____
Designed by _____ Date _____
Checked by _____ Date _____

Approved by _____ Date _____
Public Works Director _____ R.C.E. _____
Sheet 3 of 3 Sheets

APPENDIX C

BMP Operation and Maintenance

Operations and Maintenance (O&M) Plan

LOW IMPACT DEVELOPMENT (LID) PLAN

for

PROJECT NAME: Railroad Street Industrial Building

APN: **8264-009-022 and 8264-009-023**

ADDRESS: **17969 Railroad Street, City of Industry, CA 91748**

Prepared on: **January 24, 2024**

BMP Applicable? Yes/No	BMP Name and BMP Implementation, Maintenance, and Inspection Procedures	Implementation, Maintenance, and Inspection Frequency and Schedule	Person or Entity with Operation & Maintenance Responsibility
Non-Structural Source Control BMPs			
Yes	**N1. Education for Property Owners, Tenants and Occupants**	The owners will provide the tenants with information concerning good housekeeping practices that contribute to protection of storm water quality. The owner will check with City and County at least once a year to obtain new or updated educational materials and provide these materials to tenants. Employees shall be trained to clean up spills and participate in ongoing maintenance. The project site will have annual employee training and new hires within one month.	17969 Railroad St Owner, LLC c/o Rockpoint 3953 Maple Avenue, Suite 300 Dallas, TX 75219 (972) 934-0100 Contact: Ron J. Hoyl
Yes	**N2. Activity Restriction**	Prohibit discharges of fertilizer, pesticides, or animal wastes to streets or storm drains. Prohibit blowing or sweeping of debris (leaf litter, grass clippings, litter, etc.) into streets or storm drains. Requirement to keep trash receptacles covered or sheltered by a roof overhang or canopy. Prohibit vehicle washing, maintenance, or repair on the premises. Activity restriction will be enforced daily.	17969 Railroad St Owner, LLC c/o Rockpoint 3953 Maple Avenue, Suite 300 Dallas, TX 75219 (972) 934-0100 Contact: Ron J. Hoyl
Yes	**N3. Common Area Landscape Management**	Maintenance of the landscaping shall be done weekly. Irrigation must be consistent with City's Water Conservation Ordinance. Fertilizer and pesticide usage will be consistent with County Management Guidelines for Use of Fertilizers and Pesticides. Irrigation system shall be inspected monthly by landscape contractor to check for over-watering, leaks, or excessive runoff to paved areas and landscaping shall be maintained weekly and maintenance contractor shall properly dispose of all landscape wastes.	17969 Railroad St Owner, LLC c/o Rockpoint 3953 Maple Avenue, Suite 300 Dallas, TX 75219 (972) 934-0100 Contact: Ron J. Hoyl
Yes	**N4. BMP Maintenance**	BMPs to be inspected and maintained as detailed in this O&M plan.	17969 Railroad St Owner, LLC c/o Rockpoint 3953 Maple Avenue, Suite 300 Dallas, TX 75219 (972) 934-0100 Contact: Ron J. Hoyl

BMP Applicable? Yes/No	BMP Name and BMP Implementation, Maintenance, and Inspection Procedures	Implementation, Maintenance, and Inspection Frequency and Schedule	Person or Entity with Operation & Maintenance Responsibility
No	**N5. Title 22 CCR Compliance**	Not applicable at the time of preparation of this LID as the project consists of an empty shell building. The LID is to be amended and shall comply with Title 22 CCR, as applicable to the business.	Not applicable
Yes	**N7. Spill Contingency Plan**	Owner/tenant will have a spill contingency plan based on individual site needs.	17969 Railroad St Owner, LLC c/o Rockpoint 3953 Maple Avenue, Suite 300 Dallas, TX 75219 (972) 934-0100 Contact: Ron J. Hoyl
No	**N8. Underground Storage Tank Compliance**	Not applicable	Not applicable
Yes	**N9. Hazardous Materials Disclosure Compliance**	Site will be in compliance with ordinances typically enforced by respective fire protection agency for the management of hazardous materials. Los Angeles County, health care agencies, and/or other appropriate agencies (i.e. Department of Toxics Substances Control is typically responsible for enforcing hazardous materials and hazardous waste handling and disposal regulations.	17969 Railroad St Owner, LLC c/o Rockpoint 3953 Maple Avenue, Suite 300 Dallas, TX 75219 (972) 934-0100 Contact: Ron J. Hoyl
Yes	**N10. Uniform Fire Code Implementation**	Site will be in compliance with article 80 of the Uniform Fire Code enforced by fire protection agency. Inspection and maintenance as necessary.	17969 Railroad St Owner, LLC c/o Rockpoint 3953 Maple Avenue, Suite 300 Dallas, TX 75219 (972) 934-0100 Contact: Ron J. Hoyl
Yes	**N11. Common Area Litter Control**	Employees, gardeners, and the property manager will help keep the site free of trash and other debris. It will be the owner's responsibility for having the site inspected weekly and cleaned as necessary.	17969 Railroad St Owner, LLC c/o Rockpoint 3953 Maple Avenue, Suite 300 Dallas, TX 75219 (972) 934-0100 Contact: Ron J. Hoyl

BMP Applicable? Yes/No	BMP Name and BMP Implementation, Maintenance, and Inspection Procedures	Implementation, Maintenance, and Inspection Frequency and Schedule	Person or Entity with Operation & Maintenance Responsibility
Yes	**N12. Contractor/Employee Training**	The owner will ensure that tenants are also familiar with onsite BMPs and necessary maintenance required of the tenants. Owner will check with City and County at least once a year to obtain new or updated educational materials and provide these materials to tenants. Employees shall be trained to clean up spills and participate in ongoing maintenance. This LID requires bi-annually employee training and new hires within 2 months.	17969 Railroad St Owner, LLC c/o Rockpoint 3953 Maple Avenue, Suite 300 Dallas, TX 75219 (972) 934-0100 Contact: Ron J. Hoyl
Yes	**N13. Housekeeping of Loading Docks.**	Keep all fluids indoors. Clean up spills immediately and keep spills from entering storm drain system. No discharges of wastewater or cleanup water from maintenance of loading docks into the storm drain system. Area shall be inspected weekly for proper containment and practices with spills cleaned up immediately and disposed of properly. Areas under "dock high" doors shall be swept daily.	17969 Railroad St Owner, LLC c/o Rockpoint 3953 Maple Avenue, Suite 300 Dallas, TX 75219 (972) 934-0100 Contact: Ron J. Hoyl
Yes	**N14. Common Area Catch Basin Inspection**	The owner/maintenance contractor will be responsible for cleaning the catch basins on-site on a regular basis prior to the storm season, no later than October 1st of each year. Catch basins and storm drain system will be cleaned at least twice a year and prior to October 1.	17969 Railroad St Owner, LLC c/o Rockpoint 3953 Maple Avenue, Suite 300 Dallas, TX 75219 (972) 934-0100 Contact: Ron J. Hoyl
Yes	**N15. Street Sweeping Private Streets and Parking Lots.**	The owner/maintenance contractor will have the private drive swept. Hosing or watering of the site will not be permitted as a method of cleaning. Parking lots and drive isles will be swept or vacuumed at least quarterly, October 1, January 1, April 1 and July 1 and as necessary. If there is any trash or debris in between the routine sweeping it will be swept or vacuumed immediately.	17969 Railroad St Owner, LLC c/o Rockpoint 3953 Maple Avenue, Suite 300 Dallas, TX 75219 (972) 934-0100 Contact: Ron J. Hoyl
No	**N17. Retail Gasoline Outlets**	Not applicable	Not applicable
Structural Source Control BMPs			

BMP Applicable? Yes/No	BMP Name and BMP Implementation, Maintenance, and Inspection Procedures	Implementation, Maintenance, and Inspection Frequency and Schedule	Person or Entity with Operation & Maintenance Responsibility
Yes	**Provide Storm Drain System Stenciling and Signage**	All storm drain inlets and catch basins shall have stenciling or labeling such as "No Dumping – Drains to Ocean" and/or other graphical icons to alert the public to the destination of pollutants discharged into stormwater. In addition, legibility of stencils and signs must be maintained. The owner/ or maintenance contractor shall inspect signage for legibility biannually.	17969 Railroad St Owner, LLC c/o Rockpoint 3953 Maple Avenue, Suite 300 Dallas, TX 75219 (972) 934-0100 Contact: Ron J. Hoyl
No	**Design and Construct Outdoor Material Storage Areas to Reduce Pollutant Introduction**	Not applicable	Not applicable
No	**Design and Construct Trash and Waste Storage Areas to Reduce Pollutant Introduction**	Paved with an impervious surface, designed not to allow run-on from adjoining areas, designed to divert drainage from adjoining roofs and pavements diverted around the area, and screened or walled to prevent off-site transport of trash.	17969 Railroad St Owner, LLC c/o Rockpoint 3953 Maple Avenue, Suite 300 Dallas, TX 75219 (972) 934-0100 Contact: Ron J. Hoyl
Yes	**Use Efficient Irrigation Systems & Landscape Design**	Irrigation of the landscaping shall be implemented as indicated on the approved landscape drawings and be consistent with the City's Water Conservation Ordinance. The irrigation system shall have rain shutoff controls as well as a programmable timer. Short irrigation cycles should be used to meet with the plant/landscaping needs. System shall be inspected (by the owner/ or maintenance contractor) once a month to check for over watering, broken sprinkler heads or lines, and excessive runoff onto paved areas.	17969 Railroad St Owner, LLC c/o Rockpoint 3953 Maple Avenue, Suite 300 Dallas, TX 75219 (972) 934-0100 Contact: Ron J. Hoyl
No	**Protect Slopes and Channels and Provide Energy Dissipation**	Not applicable	Not applicable

BMP Applicable? Yes/No	BMP Name and BMP Implementation, Maintenance, and Inspection Procedures	Implementation, Maintenance, and Inspection Frequency and Schedule	Person or Entity with Operation & Maintenance Responsibility
Yes	**Loading Docks**	Keep all fluids indoors. Clean up spills immediately and keep spills from entering storm drain system. No discharges of wastewater or cleanup water from maintenance of loading docks into the storm drain system. Area shall be inspected weekly for proper containment and practices with spills cleaned up immediately and disposed of properly. Areas under "dock high" doors shall be swept daily.	17969 Railroad St Owner, LLC c/o Rockpoint 3953 Maple Avenue, Suite 300 Dallas, TX 75219 (972) 934-0100 Contact: Ron J. Hoyl
No	**Maintenance Bays**	Not applicable	Not applicable
No	**Vehicle Wash Areas**	Not applicable	Not applicable
No	**Outdoor Processing Areas**	Not applicable	Not applicable
No	**Equipment Wash Areas.**	Not applicable	Not applicable
No	**Fueling Area**	Not applicable	Not applicable
No	**Hillside Landscaping**	Not applicable	Not applicable
No	**Wash Water Controls for Food Preparation Areas**	Not applicable	Not applicable
No	**Community Car Wash Racks**	Not applicable	Not applicable
Treatment Control BMPs (i.e. Filter Inserts, Media Filter, etc.)			
Yes	**Hydrodynamic Separator BMP**	Open access hatches or manholes. Remove gross solids from screening basket upon reaching 25% capacity. Hinges open the bottom screen panels to access sedimentation chambers. Vacuum out sedimentation chamber when any chamber reaches 25% capacity. Inspect semi-annually (by October 1st and February 1st) and maintain, upon reaching 25% capacity, through maintenance service contract with the vendor or equally qualified contractor.	17969 Railroad St Owner, LLC c/o Rockpoint 3953 Maple Avenue, Suite 300 Dallas, TX 75219 (972) 934-0100 Contact: Ron J. Hoyl
LID BMPs			

BMP Applicable? Yes/No	BMP Name and BMP Implementation, Maintenance, and Inspection Procedures	Implementation, Maintenance, and Inspection Frequency and Schedule	Person or Entity with Operation & Maintenance Responsibility
Yes	**WetlandMod**	All work to be done by the supplier or by a supplier approved contractor. Maintenance should be done semi-annually (October 1st and February 1st). Clean separation (sediment) chamber, located directly under the manhole. Replace media in pre-filtration cartridges. Media life depends on the loading conditions and can easily be replaced and disposed of without any equipment. The BioMediaGREEN filter can be ordered from the manufacturer. Replace drain down filter media. Replacement of media takes approximately 5 minutes and is performed without any equipment. Replace wetland media. The life of the media can be up to 20 years. Remove spent media with shovel or vacuum truck and replace with new media. Media can be ordered from the manufacturer. See manufacturer's maintenance requirements for additional information.	17969 Railroad St Owner, LLC c/o Rockpoint 3953 Maple Avenue, Suite 300 Dallas, TX 75219 (972) 934-0100 Contact: Ron J. Hoyl
Yes	**Sump Pump**	Maintenance should be done semi-annually (October 1st and February 1st). Verify automatic and manual operations of pump(s). Inspect floats for proper elevation and movement. Correct any obstructions. Check incoming power and amperage for proper voltage. Hose down lift station to clean pump and floats.	17969 Railroad St Owner, LLC c/o Rockpoint 3953 Maple Avenue, Suite 300 Dallas, TX 75219 (972) 934-0100 Contact: Ron J. Hoyl
Yes	**Underground Detention System**	The isolator rows shall be inspected semi-annually (by October 1st and February 1st) and cleaned by water-flush and vacuum when solids accumulate to 3" depth. The isolator rows shall be inspected for debris and sediment accumulations and maintained by a qualified technician and he/she will properly dispose of all wastes and inspect for standing water. A manhole is installed in order to inspect and maintain the inlet row. All entry into the chamber system must be done per OSHA codes to ensure operator and inspector safety.	17969 Railroad St Owner, LLC c/o Rockpoint 3953 Maple Avenue, Suite 300 Dallas, TX 75219 (972) 934-0100 Contact: Ron J. Hoyl

Responsible Party

The owner(s), **17969 Railroad St Owner, LLC c/o Rockpoint**, is aware of the maintenance responsibilities of the proposed BMPs. A funding mechanism is in place to maintain the BMPs at the frequency stated in the LID. The contact information for the entity responsible is below:

Name:	Ron J. Hoyl
Company:	17969 Railroad St Owner, LLC c/o Rockpoint
Title:	Vice President
Address:	3953 Maple Avenue, Suite 300 Dallas, TX 75219
Phone Number:	(972) 934-0100
Email:	ron@rockpoint.com

Site Plan

For locations of BMPs, refer to the LID Site Map located within Appendix B of the LID report.

RECORD OF BMP IMPLEMENTATION, MAINTENANCE, AND INSPECTION

Today's Date: _____

Name of Person Performing Activity (Printed): _____

Signature: _____

BMP Name (As Shown in O&M Plan)	Brief Description of Implementation, Maintenance, and Inspection Activity Performed

Storm Drain Signage SD-13

Design Objectives

- Maximize Infiltration
- Provide Retention
- Slow Runoff
- Minimize Impervious Land Coverage
- ☑ Prohibit Dumping of Improper Materials
- Contain Pollutants
- Collect and Convey

Description

Waste materials dumped into storm drain inlets can have severe impacts on receiving and ground waters. Posting notices regarding discharge prohibitions at storm drain inlets can prevent waste dumping. Storm drain signs and stencils are highly visible source controls that are typically placed directly adjacent to storm drain inlets.

Approach

The stencil or affixed sign contains a brief statement that prohibits dumping of improper materials into the urban runoff conveyance system. Storm drain messages have become a popular method of alerting the public about the effects of and the prohibitions against waste disposal.

Suitable Applications

Stencils and signs alert the public to the destination of pollutants discharged to the storm drain. Signs are appropriate in residential, commercial, and industrial areas, as well as any other area where contributions or dumping to storm drains is likely.

Design Considerations

Storm drain message markers or placards are recommended at all storm drain inlets within the boundary of a development project. The marker should be placed in clear sight facing toward anyone approaching the inlet from either side. All storm drain inlet locations should be identified on the development site map.

Designing New Installations

The following methods should be considered for inclusion in the project design and show on project plans:

- Provide stenciling or labeling of all storm drain inlets and catch basins, constructed or modified, within the project area with prohibitive language. Examples include “NO DUMPING

CASQA
CALIFORNIA STORMWATER QUALITY ASSOCIATION

– DRAINS TO OCEAN" and/or other graphical icons to discourage illegal dumping.

- Post signs with prohibitive language and/or graphical icons, which prohibit illegal dumping at public access points along channels and creeks within the project area.

Note - Some local agencies have approved specific signage and/or storm drain message placards for use. Consult local agency stormwater staff to determine specific requirements for placard types and methods of application.

Redeveloping Existing Installations

Various jurisdictional stormwater management and mitigation plans (SUSMP, WQMP, etc.) define "redevelopment" in terms of amounts of additional impervious area, increases in gross floor area and/or exterior construction, and land disturbing activities with structural or impervious surfaces. If the project meets the definition of "redevelopment", then the requirements stated under " designing new installations" above should be included in all project design plans.

Additional Information

Maintenance Considerations

- Legibility of markers and signs should be maintained. If required by the agency with jurisdiction over the project, the owner/operator or homeowner's association should enter into a maintenance agreement with the agency or record a deed restriction upon the property title to maintain the legibility of placards or signs.

Placement

- Signage on top of curbs tends to weather and fade.

- Signage on face of curbs tends to be worn by contact with vehicle tires and sweeper brooms.

Supplemental Information

Examples

- Most MS4 programs have storm drain signage programs. Some MS4 programs will provide stencils, or arrange for volunteers to stencil storm drains as part of their outreach program.

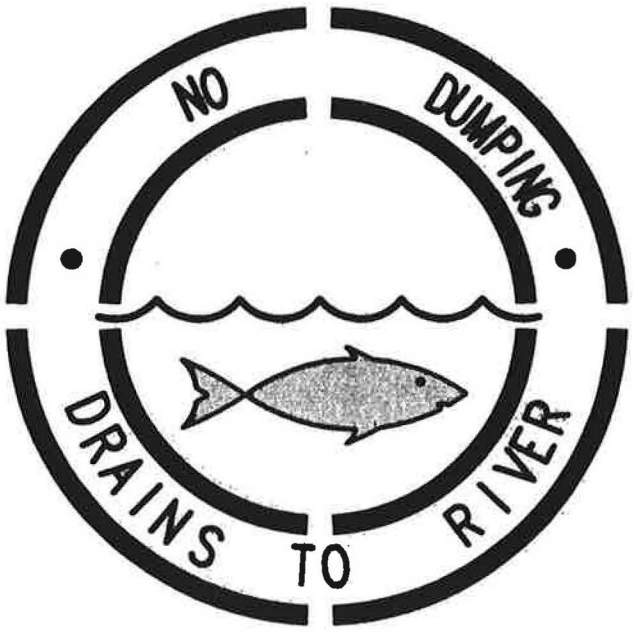
Other Resources

A Manual for the Standard Urban Stormwater Mitigation Plan (SUSMP), Los Angeles County Department of Public Works, May 2002.

Model Standard Urban Storm Water Mitigation Plan (SUSMP) for San Diego County, Port of San Diego, and Cities in San Diego County, February 14, 2002.

Model Water Quality Management Plan (WQMP) for County of Orange, Orange County Flood Control District, and the Incorporated Cities of Orange County, Draft February 2003.

Ventura Countywide Technical Guidance Manual for Stormwater Quality Control Measures, July 2002.



SAMPLE STENCIL TO BE USED NEAR GRATE AND CURB OPENING INLETS

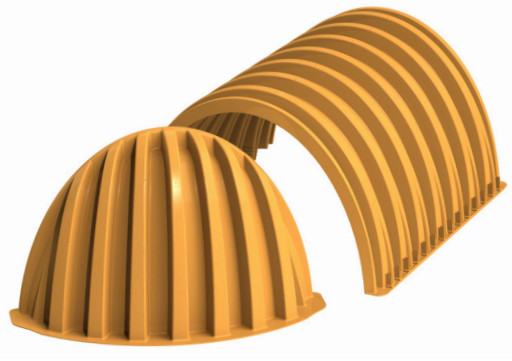
SYMBOL TO BE 24" IN DIAMETER

Thienes Engineering
CIVIL ENGINEERING • LAND SURVEYING
14349 FIRESTONE BOULEVARD
LA MIRADA, CALIFORNIA 90638
PH.(714)521-4811 FAX(714)521-4173

SAMPLE CATCH BASIN STENCIL
PER BMP SD-13

StormTech® MC-3500 Chamber

Designed to meet the most stringent industry performance standards for superior structural integrity while providing designers with a cost-effective method to save valuable land and protect water resources. The StormTech system is designed primarily to be used under parking lots, thus maximizing land usage for private (commercial) and public applications. StormTech chambers can also be used in conjunction with Green Infrastructure, thus enhancing the performance and extending the service life of these practices.



Nominal Chamber Specifications
(not to scale)

Size (L x W x H)
90” x 77” x 45”
2286 mm x 1956 mm x 1143 mm

Chamber Storage
109.9 ft³ (3.11 m³)

Min. Installed Storage*
175.0 ft³ (4.96 m³)

Weight
134 lbs (60.8 kg)

Shipping
15 chambers/pallet
7 end caps/pallet
7 pallets/truck

*Assumes a minimum of 12” (300 mm) of stone above, 9” (230 mm) of stone below chambers, 6” (150 mm) of stone between chambers/ end caps and 40% stone porosity.

Nominal End Cap Specifications
(not to scale)

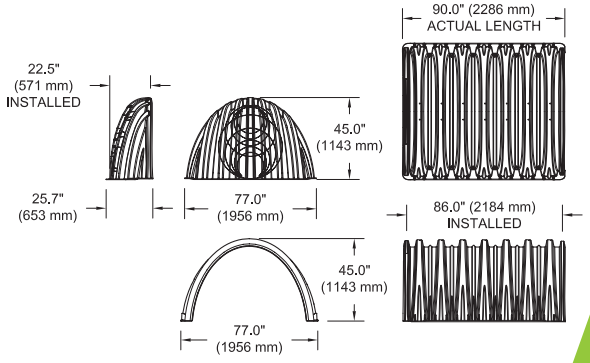
Size (L x W x H)
26.5” x 71” x 45.1”
673 mm x 1803 mm x 1145 mm

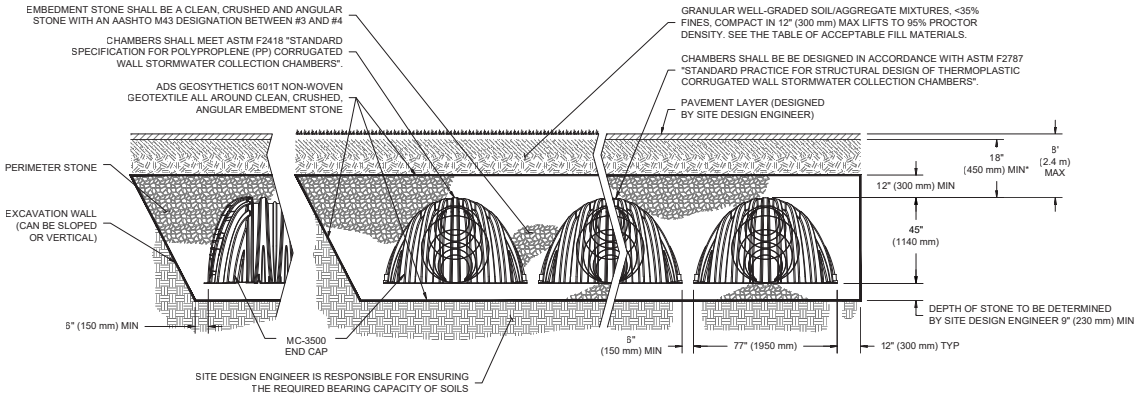
End Cap Storage
14.9 ft³ (0.42 m³)

Min. Installed Storage*
45.1 ft³ (1.28 m³)

Weight
49 lbs (22.2 kg)

*Assumes a minimum of 12” (300 mm) of stone above, 9” (230 mm) of stone below, 6” (150 mm) of stone perimeter, 6” (150 mm) of stone between chambers/ end caps and 40% stone porosity.





*MINIMUM COVER TO BOTTOM OF FLEXIBLE PAVEMENT. FOR UNPAVED INSTALLATIONS WHERE RUTTING FROM VEHICLES MAY OCCUR, INCREASE COVER TO 24" (600 mm).

ADS StormTech™

StormTech MC-3500 Specifications

Storage Volume Per Chamber

	Bare Chamber Storage ft³ (m³)	Chamber and Stone Foundation Depth in. (mm)			
		9 in (230 mm)	12 in (300 mm)	15 in (375 mm)	18 in (450 mm)
Chamber	109.9 (3.11)	175.0 (4.96)	179.9 (5.09)	184.9 (5.24)	189.9 (5.38)
End Cap	14.9 (0.42)	45.1 (1.28)	46.6 (1.32)	48.3 (1.37)	49.9 (1.41)

Note: Assumes 6" (150 mm) row spacing, 40% stone porosity, 12" (300 mm) stone above and includes the bare chamber/end cap volume.

Amount of Stone Per Chamber

English Tons (yds³)	Stone Foundation Depth			
	9 in	12 in	15 in	18 in
Chamber	8.5 (6.0)	9.1 (6.5)	9.7 (6.9)	10.4 (7.4)
End Cap	3.9 (2.8)	4.1 (2.9)	4.3 (3.1)	4.5 (3.2)
Metric Kilograms (m³)	**230 mm**	**300 mm**	**375 mm**	**450 mm**
Chamber	7711 (4.6)	8255 (5.0)	8800 (5.3)	9435 (5.7)
End Cap	3538 (2.1)	3719 (2.2)	3901 (2.4)	4082 (2.5)

Note: Assumes 12" (300 mm) of stone above and 6" (150 mm) row spacing and 6" (150 mm) of perimeter stone in front of end caps.

Volume Excavation Per Chamber yd³ (m³)

	Stone Foundation Depth			
	9 in (230 mm)	12 in (300 mm)	15 in (375mm)	18 in (450 mm)
Chamber	11.9 (9.1)	12.4 (9.5)	12.8 (9.8)	13.3 (10.2)
End Cap	4.0 (3.1)	4.1 (3.3)	4.3 (3.3)	4.4 (3.4)

Note: Assumes 6" (150 mm) of separation between chamber rows and 24" (600 mm) of cover. The volume of excavation will vary as depth of cover increases.

ADS StormTech products, manufactured in accordance with ASTM F2418 or ASTMF2922, comply with all requirements in the Build America, Buy America (BABA) Act.

Working on a project?
Visit us at adspipe.com/stormtech and utilize the Design Tool

ADS StormTech™

adspipe.com
800-821-6710

Isolator® Row Plus
O&M Manual

ADS StormTech™

The Isolator® Row Plus

Introduction

An important component of any Stormwater Pollution Prevention Plan is inspection and maintenance. The StormTech Isolator Row Plus is a technique to inexpensively enhance Total Suspended Solids (TSS) and Total Phosphorus (TP) removal with easy access for inspection and maintenance.

The Isolator Row Plus

The Isolator Row Plus is a row of StormTech chambers, either SC-160, SC-310, SC-310-3, SC-740, DC-780, MC-3500 or MC-7200 models, that is surrounded with filter fabric and connected to a closely located manhole for easy access. The fabric-wrapped chambers provide for sediment settling and filtration as stormwater rises in the Isolator Row Plus and passes through the filter fabric. The open bottom chambers and perforated sidewalls (SC-310, SC- 310-3 and SC-740 models) allow stormwater to flow both vertically and horizontally out of the chambers. Sediments are captured in the Isolator Row Plus protecting the adjacent stone and chambers storage areas from sediment accumulation.

ADS geotextile fabric is placed between the stone and the Isolator Row Plus chambers. The woven geotextile provides a media for stormwater filtration, a durable surface for maintenance, prevents scour of the underlying stone and remains intact during high pressure jetting. A non-woven fabric is placed over the chambers to provide a filter media for flows passing through the chamber's sidewall. The non-woven fabric is not required over the SC-160, DC-780, MC-3500 or MC-7200 models as these chambers do not have perforated side walls.

The Isolator Row Plus is designed to capture the "first flush" runoff and offers the versatility to be sized on a volume basis or a flow-rate basis. An upstream manhole provides access to the Isolator Row Plus and includes a high/low concept such that stormwater flow rates or volumes that exceed the capacity of the Isolator Row Plus bypass through a manifold to the other chambers. This is achieved with an elevated bypass manifold or a high-flow weir. This creates a differential between the Isolator Row Plus row of chambers and the manifold to the rest of the system, thus allowing for settlement time in the Isolator Row Plus. After Stormwater flows through the Isolator Row Plus and into the rest of the chamber system it is either exfiltrated into the soils below or passed at a controlled rate through an outlet manifold and outlet control structure.

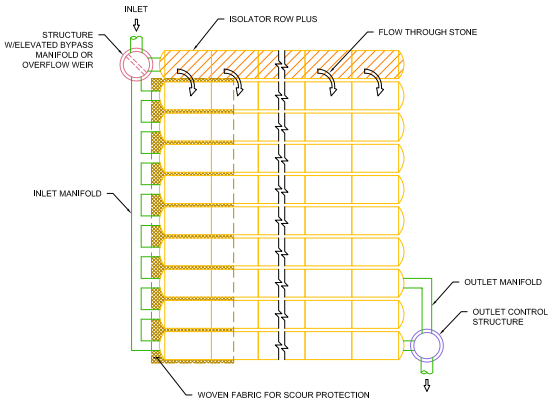
The Isolator Row FLAMP™ (patent pending) is a flared end ramp apparatus attached to the inlet pipe on the inside of the chamber end cap. The FLAMP provides a smooth transition from pipe invert to fabric bottom. It is configured to improve chamber function performance by enhancing outflow of solid debris that would otherwise collect at the chamber's end. It also serves to improve the fluid and solid flow into the access pipe during maintenance and cleaning and to guide cleaning and inspection equipment back into the inlet pipe when complete.

The Isolator Row Plus may be part of a treatment train system. The treatment train design and pretreatment device selection by the design engineer is often driven by regulatory requirements. Whether pretreatment is used or not, StormTech recommend using the Isolator Row Plus to minimize maintenance requirements and maintenance costs.

Note: *See the StormTech Design Manual for detailed information on designing inlets for a StormTech system, including the Isolator Row Plus.*

Looking down the Isolator Row PLUS from the manhole opening, ADS PLUS Fabric is shown between the chamber and stone base.

StormTech Isolator Row PLUS with Overflow Spillway (not to scale)



Isolator Row Plus Inspection/Maintenance

Inspection

The frequency of inspection and maintenance varies by location. A routine inspection schedule needs to be established for each individual location based upon site specific variables. The type of land use (i.e. industrial, commercial, residential), anticipated pollutant load, percent imperviousness, climate, etc. all play a critical role in determining the actual frequency of inspection and maintenance practices.

At a minimum, StormTech recommends annual inspections. Initially, the Isolator Row Plus should be inspected every 6 months for the first year of operation. For subsequent years, the inspection should be adjusted based upon previous observation of sediment deposition.

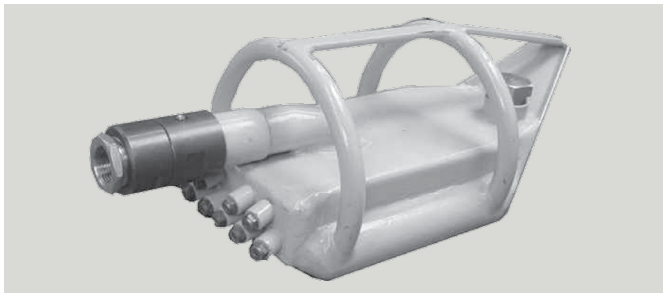
The Isolator Row Plus incorporates a combination of standard manhole(s) and strategically located inspection ports (as needed). The inspection ports allow for easy access to the system from the surface, eliminating the need to perform a confined space entry for inspection purposes.

If upon visual inspection it is found that sediment has accumulated, a stadia rod should be inserted to determine the depth of sediment. When the average depth of sediment exceeds 3 inches throughout the length of the Isolator Row Plus, clean-out should be performed.

Maintenance

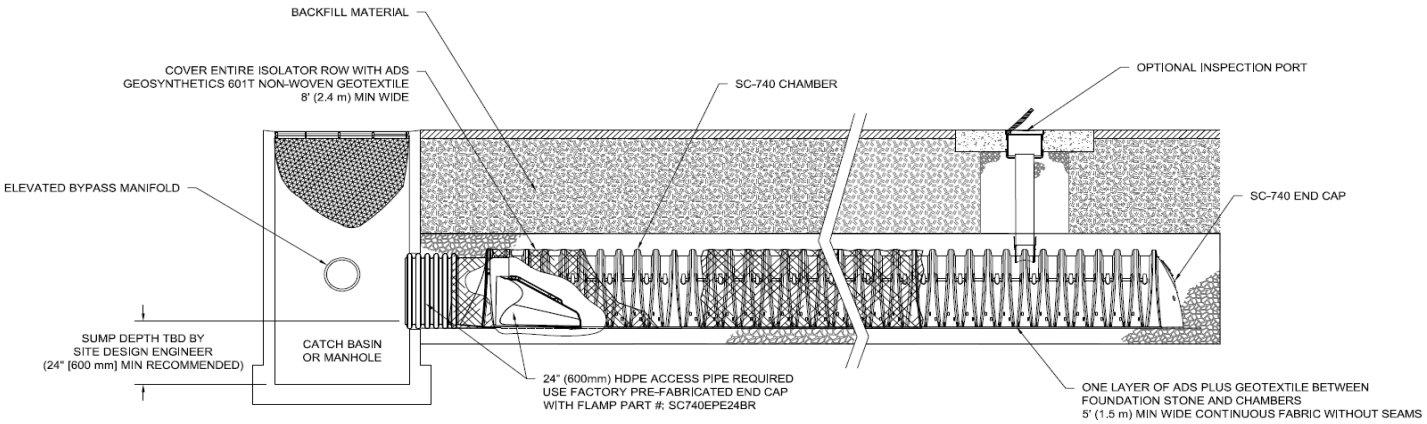
The Isolator Row Plus was designed to reduce the cost of periodic maintenance. By "isolating" sediments to just one row, costs are dramatically reduced by eliminating the need to clean out each row of the entire storage bed. If inspection indicates the potential need for maintenance, access is provided via a manhole(s) located on the end(s) of the row for cleanout. If entry into the manhole is required, please follow local and OSHA rules for a confined space entries.

Maintenance is accomplished with the JetVac process. The JetVac process utilizes a high pressure water nozzle to propel itself down the Isolator Row Plus while scouring and suspending sediments. As the nozzle is retrieved, the captured pollutants are flushed back into the manhole for vacuuming. Most sewer and pipe maintenance companies have vacuum/JetVac combination vehicles. Selection of an appropriate JetVac nozzle will improve maintenance efficiency. Fixed nozzles designed for culverts or large diameter pipe cleaning are preferable. Rear facing jets with an effective spread of at least 45" are best. StormTech recommends a maximum nozzle pressure of 2000 psi be utilized during cleaning. JetVac reels can vary in length. For ease of maintenance, ADS recommends Isolator Row Plus lengths up to 200' (61 m). **The JetVac process shall only be performed on StormTech Isolator Row Plus that have ADS Plus Fabric (as specified by StormTech) over their angular base stone.**



StormTech Isolator Row PLUS (*not to scale*)

Note: *Non-woven fabric is only required over the inlet pipe connection into the end cap for SC-160LP, DC-780, MC-3500 and MC-7200 chamber models and is not required over the entire Isolator Row PLUS.*



Isolator Row Plus Step By Step Maintenance Procedures

Step 1

Inspect Isolator Row Plus for sediment.

A) Inspection ports (if present)
- i. Remove lid from floor box frame
- ii. Remove cap from inspection riser
- iii. Using a flashlight and stadia rod,measure depth of sediment and record results on maintenance log.
- iv. If sediment is at or above 3 inch depth, proceed to Step 2. If not, proceed to Step 3.

B) All Isolator Row Plus
- i. Remove cover from manhole at upstream end of Isolator Row Plus
- ii. Using a flashlight, inspect down Isolator Row Plus through outlet pipe
  1. Mirrors on poles or cameras may be used to avoid a confined space entry
  2. Follow OSHA regulations for confined space entry if entering manhole
- iii. If sediment is at or above the lower row of sidewall holes (approximately 3 inches), proceed to Step 2.
  If not, proceed to Step 3.

Step 2

Clean out Isolator Row Plus using the JetVac process.

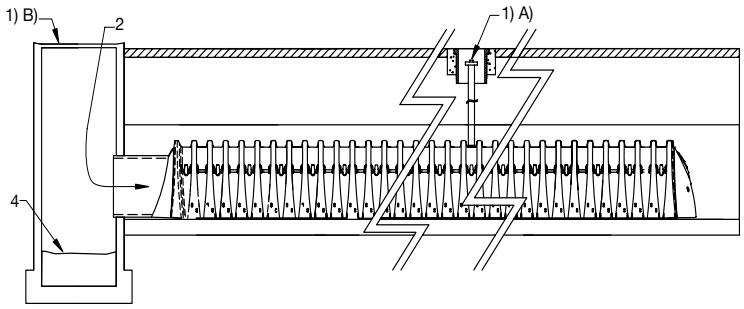
A) A fixed floor cleaning nozzle with rear facing nozzle spread of 45 inches or more is preferable
B) Apply multiple passes of JetVac until backflush water is clean
C) Vacuum manhole sump as required

Step 3

Replace all caps, lids and covers, record observations and actions.

Step 4

Inspect & clean catch basins and manholes upstream of the StormTech system.



Sample Maintenance Log

Date	Stadia Rod Readings		Sedi-ment Depth (1)–(2)	Observations/Actions	Inspector
	Fixed point to chamber bottom (1)	Fixed point to top of sediment (2)			
3/15/11	6.3 ft	none		New installation. Fixed point is CI frame at grade	DJM
9/24/11		6.2	0.1 ft	Some grit felt	SM
6/20/13		5.8	0.5 ft	Mucky feel, debris visible in manhole and in Isolator Row PLUS, maintenance due	NV
7/7/13	6.3 ft		0	System jetted and vacuumed	DJM

adspipe.com
800-821-6710

PSI Pacific Southwest Industries

ENGINEERED - PUMPS/FLUID HANDLING & DISPOSAL SYSTEMS - PACKAGED LIFT STATIONS

LIFT STATION REQUIRED MAINTENANCE

The lift station should be inspected twice a year for proper operation, and should be checked for overabundance of solid matter such as grease and soap buildup.

Proper operation and inspection would include the following:

1) Automatic operation of the system by float activation. One pump starting at lead on levels, second pump starting at high level conditions; manual operation by use of the selector switches.

2) Inspect floats for proper elevation and for proper movement. Correct any obstructions.

3) Check incoming power for proper voltage. Check voltage at motor connections.

4) Check amperage of each motor.

5) Hose down lift station to clean the walls of the wet well, pumps and floats.

MECHANICAL SEAL INSPECTION OF PUMPS

Inspection of the mechanical seals should be done every two years.

The inspection will include the following:

Pull pump out of wet well. Remove oil seal plug and inspect the oil for clarity. Clear oil indicates no water intrusion and chamber is to be topped off with 30 weight turbine oil. If oil is cloudy the mechanical seal and oil needs to be replaced.

Note: Your lift station is designed to pump raw unscreened sewage. Refrain from putting the following into your sewage system: tampons, feminine napkins, condoms, handy wipes, baby wipes, paper towels, diapers, plastic bags, q-tips, etc., and food grease. Although grease will be pumped, grease will cause problems eventually and will not be covered under the manufacturer's warranty. Dispose of the above items in a trash can.

PSI recommends that preventive maintenance and service be performed by a qualified technician.

Any question regarding your lift station should be directed to Scott Richardson at 800-358-9095.

P O Box 520 Lake Elsinore, CA 92531 – 18541 Collier Ave., Lake Elsinore, CA 92530
(800) 358-9095 (909) 674-2144 fax (909) 674-9444 CSL #583052
www.psipumps.com Email: info@psipumps.com

Bio Clean

A Forterra Company

WetlandMod® Separator

A Stormwater Biofiltration Solution

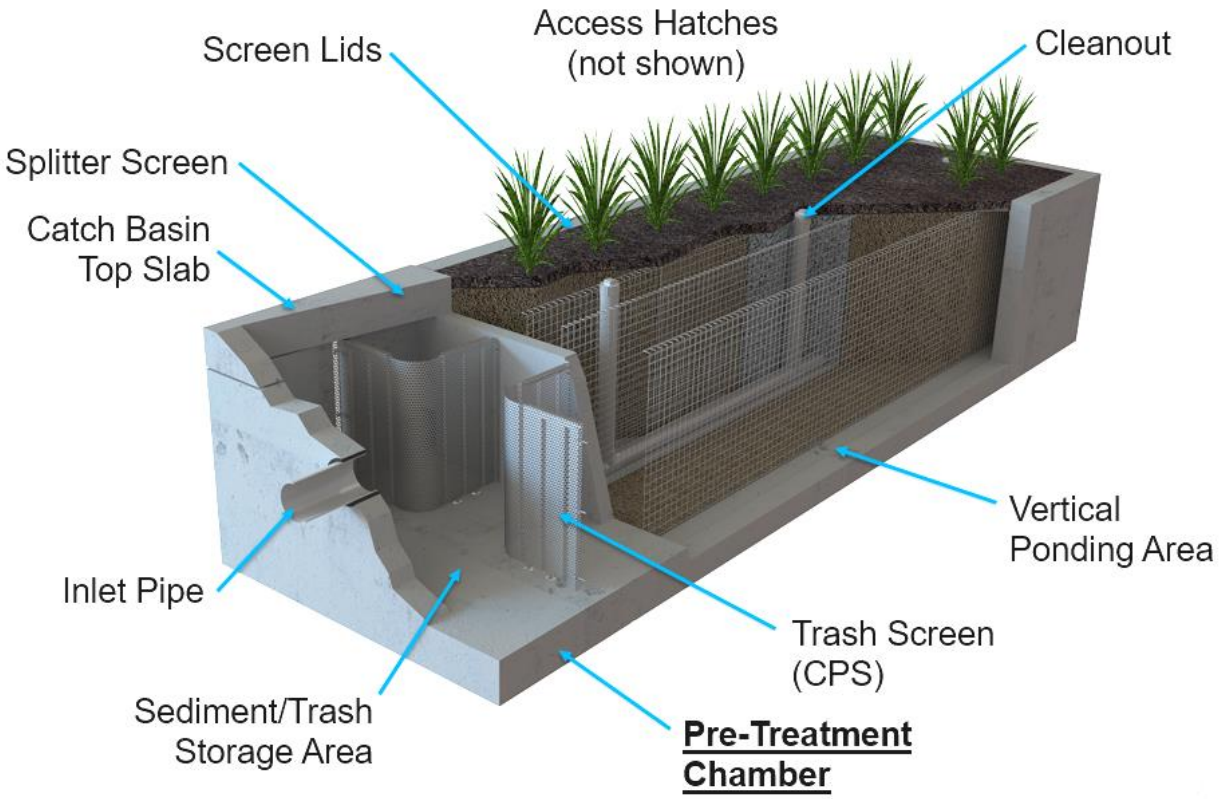
OPERATION & MAINTENANCE MANUAL

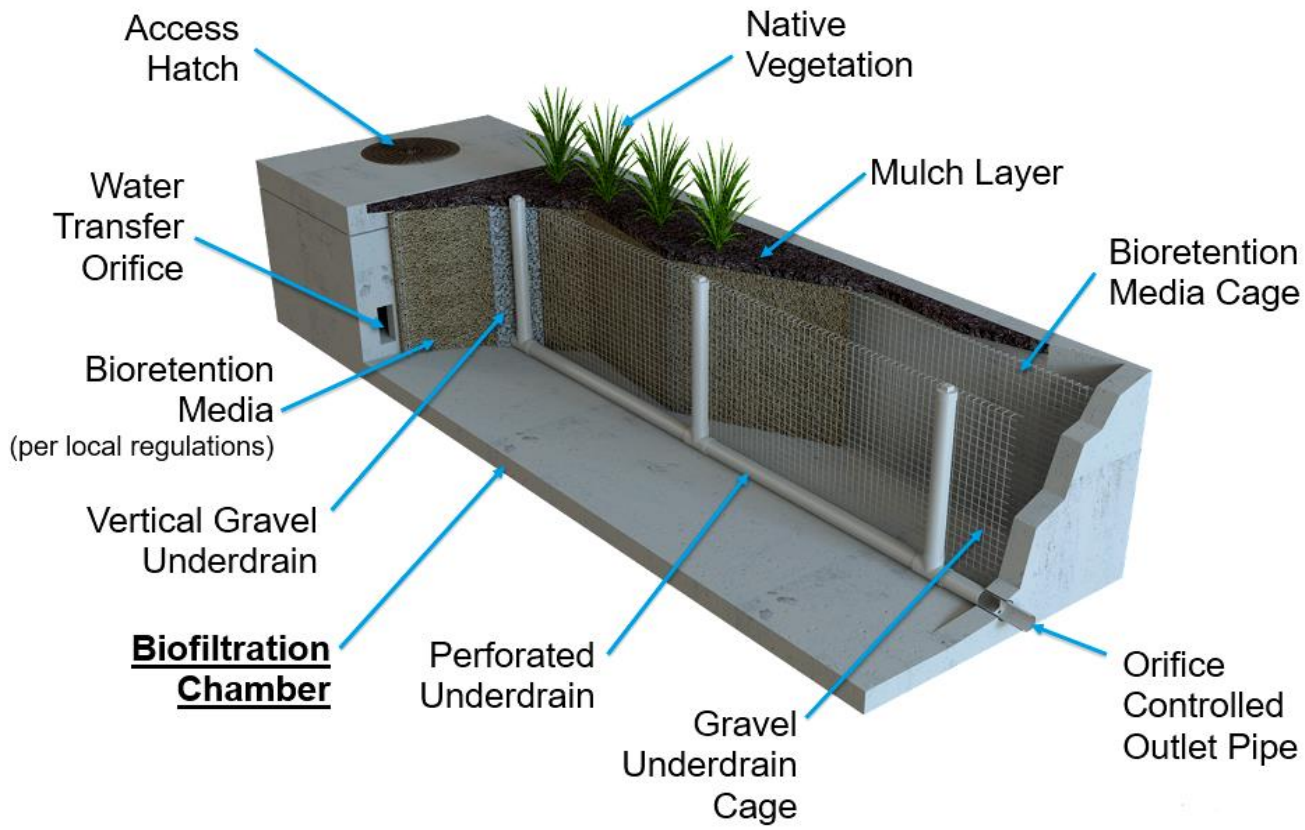
Inspection Guidelines for WetlandMod

Inspection Summary

- Inspect Pre-Treatment Chamber – average inspection interval is 6 to 12 months.
  - (5-*minute average inspection time*).
- Inspect Biofiltration Chamber – average inspection interval is 6 to 12 months.
  - (1*0-minute average inspection time*).
- NOTE: Pollutant loading varies greatly from site to site and no two sites are the same. Therefore, the first year requires inspection monthly during the wet season and every other month during the dry season in order to observe and record the amount of pollutant loading the system is receiving.

System Diagram





Inspection Overview

As with all stormwater BMPs inspection and maintenance on the WetlandMod is necessary. Stormwater regulations require that all BMPs be inspected and maintained to ensure they are operating as designed to allow for effective pollutant removal and provide protection to receiving water bodies. It is recommended that inspections be performed multiple times during the first year to assess the site specific loading conditions. This is recommended because pollutant loading and pollutant characteristics can vary greatly from site to site. Variables such as nearby soil erosion or construction sites, winter sanding on roads, amount of daily traffic and land use can increase pollutant loading on the system. The first year of inspections can be used to set inspection and maintenance intervals for subsequent years to ensure appropriate maintenance is provided. Without appropriate maintenance a BMP will exceed its storage capacity which can negatively affect its continued performance in removing and retaining captured pollutants.

Inspection Equipment:

Following is a list of equipment to allow for simple and effective inspection of the WetlandMod:

- WetlandMod Inspection Form
- Flashlight
- Manhole hook or appropriate tools to remove access hatches and covers (if applicable)
- Appropriate traffic control signage and procedures
- Measuring pole and/or tape measure.
- Protective clothing and eye protection.

- Note: entering a confined space requires appropriate safety and certification. It is generally not required for routine inspections of the system.

Inspection Steps

The core to any successful stormwater BMP maintenance program is routine inspections. The inspection steps required on the WetlandMod are quick and easy. As mentioned above the first year should be seen as the maintenance interval establishment phase. During the first year more frequent inspections should occur in order to gather loading data and maintenance requirements for that specific site. This information can be used to establish a base for long-term inspection and maintenance interval requirements.

The WetlandMod can be inspected though visual observation without entry into the system. All necessary pre-inspection steps must be carried out before inspection occurs, especially traffic control and other safety measures to protect the inspector and near-by pedestrians from any dangers associated with an open access. Once the top tray is removed the following apply:

- Prepare the inspection form by writing in the necessary information including project name, location, date & time, unit number and other info (see inspection form).
- Observe the inside of the pre-treatment chamber and biofiltration chamber once the access hatch is removed. If minimal light is available and vision into the unit is impaired utilize a flashlight to see inside the system and all of its chambers.
- Look for any out of the ordinary obstructions in the inflow pipe, around the trash screen (CPS), on the surface of the media, or in the drain down riser. Write down any observations on the inspection form.
- Through observation and/or digital photographs estimate the amount of trash, debris and sediment accumulated in the chamber. Utilizing a tape measure or measuring stick estimate the amount of trash, debris and sediment on the floor of each chamber. Record this depth on the inspection form.
- Finalize inspection report for analysis by the maintenance manager to determine if maintenance is required.

Maintenance Indicators

Based upon observations made during inspection, maintenance of the system may be required based on the following indicators:

- Missing or damaged internal components.
- Obstructions in the system or its inlet or outlet.

- Excessive accumulation of floatables more than 12” in depth in the pre-treatment chamber.
- Excessive accumulation of sediment of more than 6” in depth in the biofiltration chamber.
- Excessive build up on the vertical surface of the biofiltration media.
- Overgrown vegetation.
- Storage area around media cage has standing water 72 hours after a storm event.

Inspection Notes

1. Following maintenance and/or inspection, it is recommended the maintenance operator prepare a maintenance/inspection record. The record should include any maintenance activities performed, amount and description of debris collected, and condition of the system and its various filter mechanisms.

2. The owner should keep maintenance/inspection record(s) for a minimum of five years from the date of maintenance. These records should be made available to the governing municipality for inspection upon request at any time.

3. Transport all debris, trash, organics and sediments to approved facility for disposal in accordance with local and state requirements.

4. Entry into chambers may require confined space training based on state and local regulations.

5. No fertilizer shall be used in the Biofiltration Media.

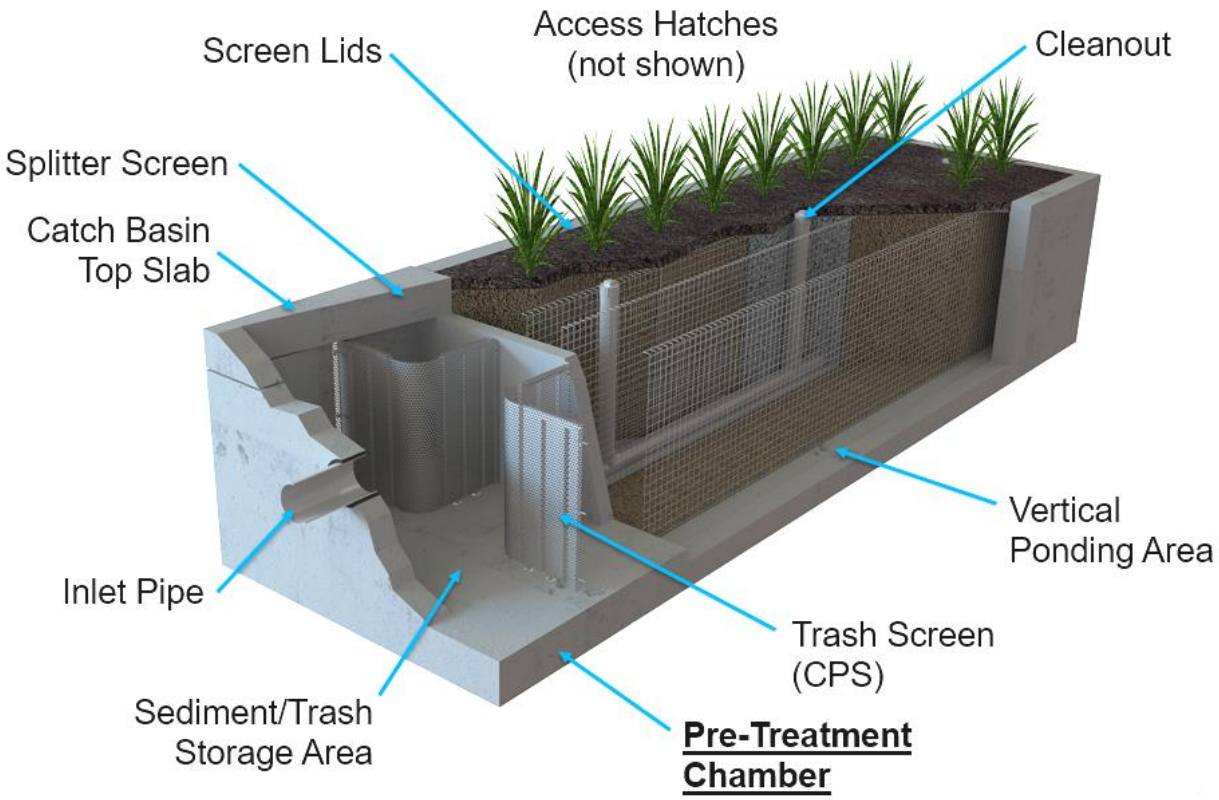
6. Irrigation should be provided as recommended by manufacturer and/or landscape architect. Amount of irrigation required is dependent on plant species. Some plants may not require irrigation after initial establishment.

Maintenance Guidelines for WetlandMod

Maintenance Summary

- Remove Sediment and Trash from Pre-Treatment Chamber – average maintenance interval is 6 to 12 months.
  - (*15 minute average service time*).
- Removed Sediment and Pressure Wash Biofiltration Media Surface – average maintenance interval 12 to 24 months.
  - (*15-60 minutes depending on size of system).*
- Trim Vegetation – average maintenance interval is 6 to 12 months.
  - (*Service time varies*).

System Diagram



Maintenance Overview

The time has come to maintain your WetlandMod. To ensure successful and efficient maintenance on the system we recommend the following. The WetlandMod can be maintained by removing the access hatches. The mulch over the top tray should be removed prior to removing the top hatch over the biofiltration chamber. All necessary pre-maintenance steps must be carried out before maintenance occurs, especially traffic control and other safety measures to protect the inspector and near-by pedestrians from any dangers associated with an open access hatch or manhole. Once traffic control has been set up per local and state regulations and access covers have been safely opened the maintenance process can begin. It should be noted that no maintenance activities require confined space entry but if entry is done all confined space requirements must be strictly followed before entry into the system. In addition the following is recommended:

- Prepare the maintenance form by writing in the necessary information including project name, location, date & time, unit number and other info (see maintenance form).
- Set up all appropriate safety and cleaning equipment.
- Ensure traffic control is set up and properly positioned.
- Prepare a pre-checks (OSHA, safety, confined space entry) are performed.

Maintenance Equipment

Following is a list of equipment required for maintenance of the WetlandMod:

- WetlandMod Maintenance Form
- Manhole hook or appropriate tools to access hatches and covers (if applicable)
- Protective clothing, flashlight and eye protection.
- Vacuum assisted truck with pressure washer.
- Replacement pre-filter wraps (order from manufacturer).

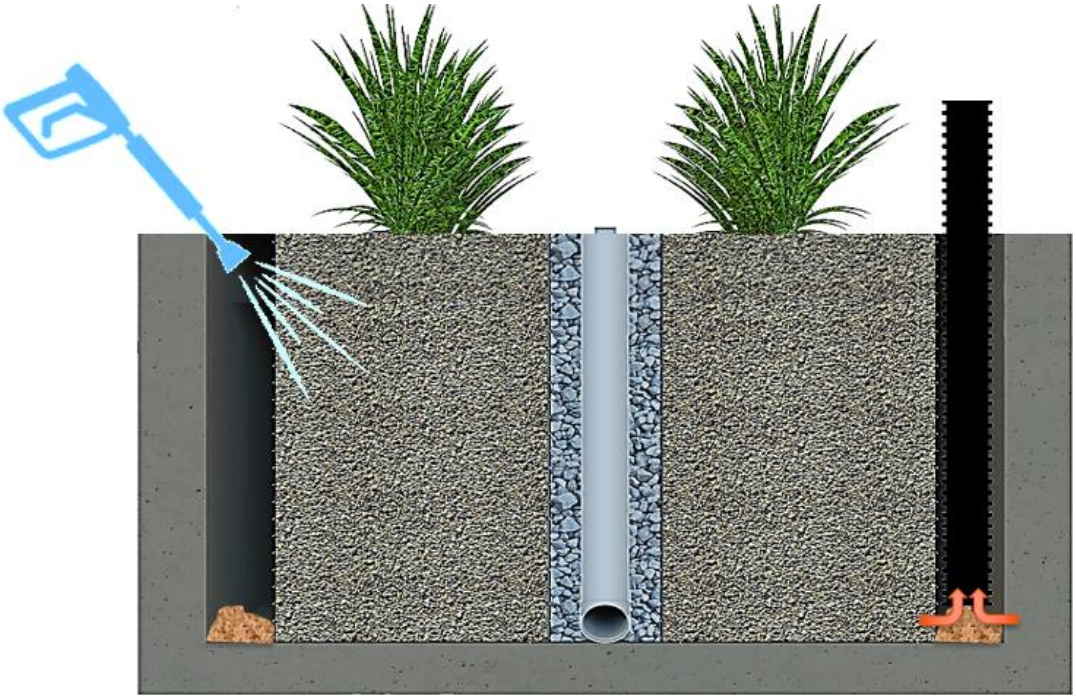
Maintenance Steps

1. Pre-Treatment Chamber (first chamber that contains trash screens)

   A. Remove access hatch and position vacuum truck accordingly.
   B. With a pressure washer spray down pollutants accumulated on trash screens.
   C. Vacuum out all accumulated pollutants including trash, debris and sediments. Be sure to vacuum the floor, screens, and walls along with outlet side of screens.

2. Biofiltration Chamber (vegetated chamber)

   A. Remove the mulch along each side of the unit. Rake away from side walls. Remove top covers to gain access to void areas.
   B. Pressure wash off the vertical surface of the media be using a pressure washer and a vacuum hose to collect and material on the floor around the cage. Pressure wash down into the media to allow accumulated sediments to flow back into the surrounding perimeter separation area for collection with the vac hose.
   C. Replace the top covers.
   D. Trim any vegetation that is overgrown.
   E. Replace the mulch to cover the top covers.



Maintenance Notes

1. Transport all debris, trash, organics and sediments to approved facility for disposal in accordance with local and state requirements.
2. Entry into chambers may require confined space training based on state and local regulations.
3. No fertilizer shall be used in the Biofiltration Chamber.
4. Irrigation should be provided as recommended by manufacturer and/or landscape architect. Amount of irrigation required is dependent on plant species. Some plants may not require irrigation after initial establishment

Inspection Form

Bio Clean, A Forterra Company
P. 760.433-7640
F. 760-433-3176
E. stormwater@forterrabp.com

www.biocleanenvironmental.com

Inspection Report
WetlandMod System

Project Name _____

Project Address _____
(city) (Zip Code)

Owner / Management Company _____

Contact _____ Phone ( ) –

Inspector Name _____ Date ____/____/____ Time _____ AM / PM

Type of Inspection ☐ Routine ☐ Follow Up ☐ Complaint ☐ Storm Storm Event in Last 72-hours? ☐ No ☐ Yes

Weather Condition _____ Additional Notes _____

For Office Use Only
(Reviewed By)
(Date)
Office personnel to complete section to the left.

Inspection Checklist

WetlandMod System: _____ Size (Model): _____

Structural Integrity:	**Yes**	**No**	**Comments**
Damage to pre-treatment access cover (manhole cover/grate) or cannot be opened using normal lifting pressure?			
Damage to discharge chamber access cover (manhole cover/grate) or cannot be opened using normal lifting pressure?			
Does the MWS unit show signs of structural deterioration (cracks in the wall, damage to frame)?			
Is the inlet/outlet pipe or drain down pipe damaged or otherwise not functioning properly?			
Working Condition:			
Is there evidence of illicit discharge or excessive oil, grease, or other automobile fluids entering and clogging the unit?			
Is there standing water in inappropriate areas after a dry period?			
Is the filter insert (if applicable) at capacity and/or is there an accumulation of debris/trash on the shelf system?			
Does the depth of sediment/trash/debris suggest a blockage of the inflow pipe, bypass or cartridge filter? If yes, specify which one in the comments section. Note depth of accumulation in in pre-treatment chamber.			Depth:
Does the cartridge filter media need replacement in pre-treatment chamber and/or discharge chamber?			Chamber:
Any signs of improper functioning in the discharge chamber? Note issues in comments section.			
Other Inspection Items:			
Is there an accumulation of sediment/trash/debris in the wetland media (if applicable)?			
Is it evident that the plants are alive and healthy (if applicable)? Please note Plant Information below.			
Is there a septic or foul odor coming from inside the system?			

Waste:	**Yes**	**No**
Sediment / Silt / Clay		
Trash / Bags / Bottles		
Green Waste / Leaves / Foliage		

Recommended Maintenance	
No Cleaning Needed	
Schedule Maintenance as Planned	
Needs Immediate Maintenance	

Plant Information	
Damage to Plants	
Plant Replacement	
Plant Trimming	

Additional Notes: _____

398 Via El Centro, Oceanside, CA 92058 P (760) 433-7640 F (760) 433-3176

Maintenance Report

Bio Clean, A Forterra Company
P. 760.433-7640
F. 760-433-3176
E. stormwater@forterrabp.com

www.biocleanenvironmental.com

Cleaning and Maintenance Report
WetlandMod System

Project Name _____

Project Address _____
(city) (Zip Code)

Owner / Management Company _____

Contact _____ Phone ( ) –

Inspector Name _____ Date ____/____/____ Time _____ AM / PM

Type of Inspection ☐ Routine ☐ Follow Up ☐ Complaint ☐ Storm Storm Event in Last 72-hours? ☐ No ☐ Yes

Weather Condition _____ Additional Notes _____

For Office Use Only
(Reviewed By)
(Date)
Office personnel to complete section to the left.

Site Map #	GPS Coordinates of Insert	Manufacturer / Description / Sizing	Trash Accumulation	Foliage Accumulation	Sediment Accumulation	Total Debris Accumulation	Condition of Media 25/50/75/100 (will be changed @ 75%)	Operational Per Manufactures' Specifications (If not, why?)
	Lat: Long:	WM Catch Basins						
		WM Sedimentation Basin						
		CPS Filter Condition						
		Plant Condition						
		Drain Down Media Condition						
		Discharge Chamber Condition						
		Drain Down Pipe Condition						
		Inlet and Outlet Pipe Condition						

Comments:

398 Via El Centro, Oceanside, CA 92058 P. 760.433.7640 F. 760.433.3176

ADS® Barracuda™ Max

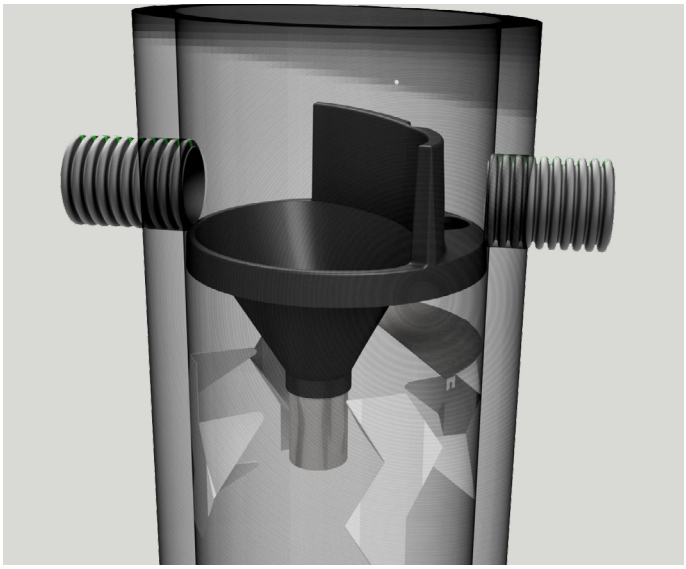
The Barracuda Max is market-changing stormwater quality technology. This high-performance vortex hydrodynamic separator is designed to remove total suspended solids in order to protect our precious receiving waters. The Barracuda Max is also an outstanding value that offers multiple pipe configurations, and quick installation. The “Max” version of the Barracuda is built on the base platform of the original ADS Barracuda with improved removal efficiencies and installation components.

Features

- Single manhole design
- No elevation loss between the inlet and outlet
- Variable inlet/outlet angle configurations (not just 180 degree orientation)
- Internal bypass for inline installation (where applicable)
- Revolutionary, patent-pending “teeth” mitigate turbulence in the sump area to prevent re-suspension of captured contaminants and an added deflector plate and bowl extension enhance the unit’s removal capabilities

Benefits

- Internal components are in stock for quick delivery
- The S3, S4, S6, and S8 can be installed in a standard 36” (900 mm), 48” (1200 m), 72” (1800 m), and 96” (2400 m) precast manhole, respectively
- The S3 & S4 can be provided factory installed within a 36” (900 mm) and 48” (1200 mm) ADS HP manhole and delivered to the jobsite
- The Barracuda Max “teeth” and deflector plate apparatus are fabricated and designed for quick and easy field assembly
- Designed for easy maintenance using a vacuum truck or similar equipment.
- Inspection and maintenance are performed from the surface with no confined space entry



ADS™

Barrucuda Specification

Materials and Design

- Concrete Structures: Designed for H-20 traffic loading and applicable soil loads or as otherwise determined by a Licensed Professional Engineer. The materials and structural design of the devices shall be per ASTM C857 and ASTM C858.
- 36” (900 mm) and 48” (1200 mm) HP Manhole Structures: Made from an impact modified copolymer polypropylene meeting the material requirements of ASTM F2764. The eccentric cone reducer shall be manufactured from polyethylene material meeting ASTM D3350 cell class 213320C. Gaskets shall be made of material meeting the requirements of ASTM F477.
- Separator internals shall be substantially constructed of stainless steel, polyethylene or other thermoplastic material approved by the manufacturer.

Performance

- The stormwater treatment unit shall be an inline unit capable of conveying 100% of the design peak flow. If peak flow rates exceed maximum hydraulic rate, the unit shall be installed offline.
- The Barracuda Max unit shall be designed to remove at least 80% of the suspended solids on an annual aggregate removal basis. Said removal shall be based on full-scale third party testing using OK-110 media gradation or equivalent and 300 mg/L influent concentration. Said full scale testing shall have included sediment capture based on actual total mass collected by the stormwater treatment unit.

  - OR -

  The Barracuda Max unit shall be designed to remove at least 50% of TSS using a media mix with d_{50}=75 micron and 200 mg/L influent concentration.

  - OR -

  The Barracuda Max unit shall be designed to remove at least 50% of TSS per current NJDEP/NJCAT HDS protocol.
- The stormwater treatment unit internals shall consist of (1) separator cone assembly, and (1) sump assembly, which includes the “teeth”.

Barracuda Max Model	Manhole Diameter	NJDEP (50% removal)	OK-110 (80% removal)
S3	36” (900 mm)	0.85 CFS (24.1 L/s)	0.86 CFS (24.1 L/s)
S4	48” (1200 mm)	1.52 CFS (43.0 L/s)	1.52 CFS (43.0 L/s)
S6	72” (1800 mm)	3.40 CFS (96.3 L/s)	3.42 CFS (96.8 L/s)
S8	96” (2400 mm)	6.08 CFS (172.2 L/s)	6.08 CFS (172.2 L/s)

* Peak bypass flows are dependent on final design

Installation

Installation of the stormwater treatment unit(s) shall be performed per manufacturer’s installation instructions. Such instructions can be obtained by calling Advanced Drainage Systems at 800-821-6710 or by logging on to www.adspipe.com.

adspipe.com
800-821-6710

Barracuda® Max & Barracuda Maintenance Guide

One of Barracuda's advantages is the ease of maintenance. Like any system that collects pollutants, the Barracuda must be maintained for continued effectiveness. Maintenance is a simple procedure performed using a vacuum truck or similar equipment. The systems were designed to minimize the volume of water removed during routine maintenance, reducing disposal costs.

Contractors can access the pollutants stored in the manhole through the manhole cover. This allows them to gain vacuum hose access to the bottom of the manhole to remove sediment and trash. There is no confined space entry necessary for inspection or maintenance.

The entire maintenance procedure typically takes 2 to 4 hours, depending on the system's size, the captured material, and the vacuum truck's capacity.

Local regulations may apply to the maintenance procedure. Safe and legal disposal of pollutants is the responsibility of the maintenance contractor. Maintenance should be performed only by a qualified contractor.

Inspection and Cleaning Cycle

Periodic inspection is needed to determine the need for and frequency of maintenance. You should begin inspecting as soon as construction is complete and then on an annual basis. Typically, the system needs to be cleaned every 1-3 years.

Excessive oils, fuels or sediments may reduce the maintenance cycle. Periodic inspection is important.

Determining When to Clean

To determine the sediment depth, the maintenance contractor should lower a stadia rod into the manhole until it contacts the top of the captured sediment and mark that spot on the rod. Then push the probe through to the bottom of the sump and mark that spot to determine sediment depth.

Maintenance should occur when the sediment has reached the levels indicated in the Storage Capacity Chart.

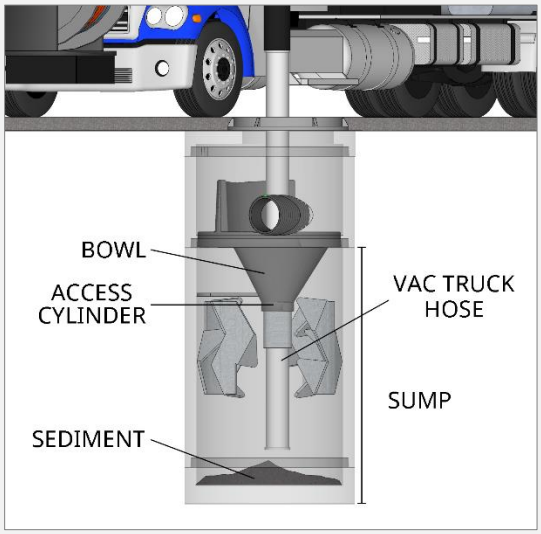
Barracuda Storage Capacities

Model	Manhole Diameter in. (mm)	Total System Volume Gallons (Liters)	Treatment Chamber Capacity Gallons (Liters)	Standard Sediment Capacity (20" depth) Yards^3 (meters^3)	NJDEP Sediment Capacity (50% of standard depth) Yards^3 (meters^3)
S3	36 (900)	264 (999)	212 (803)	0.44 (0.34)	0.22 (0.17)
S4	48 (1200)	665 (2517)	564 (2135)	0.78 (0.60)	0.39 (0.30)
S6	72 (1800)	1497 (5667)	1269 (4804)	1.75 (1.34)	0.88 (0.67)
S8	96 (2400)	4196 (15884)	3835 (14517)	3.10 (2.37)	1.55 (1.19)

Maintenance Instructions

1. Remove the manhole cover to provide access to the pollutant storage. Pollutants are stored in the sump, below the bowl assembly visible from the surface. Access this area through the 8" (200 mm), 10" (250 mm), 15" (375 mm) or 20" (500 mm) diameter access cylinder.
2. Use a vacuum truck or other similar equipment to remove all water, debris, oils and sediment. See figure 1.
3. Use a high pressure hose to clean the manhole of all the remaining sediment and debris. Then, use the vacuum truck to remove the water.
4. Fill the cleaned manhole with water until the level reaches the invert of the outlet pipe.
5. Replace the manhole cover.
6. Dispose of the polluted water, oils, sediment and trash at an approved facility.
    a. Local regulations prohibit the discharge of solid material into the sanitary system. Check with the local sewer authority for authority to discharge the liquid.
    b. Some localities treat the pollutants as leachate. Check with local regulators about disposal requirements.
    c. Additional local regulations may apply to the maintenance procedure.

Figure 1



APPENDIX D

Maintenance and Covenant Agreement

RECORDING REQUESTED BY AND MAIL TO:

CITY OF INDUSTRY
ENGINEERING DEPARTMENT
15625 EAST STAFFORD STREET #100
CITY OF INDUSTRY, CA 91744

Space above this line is for Recorder's use

COVENANT AND AGREEMENT REGARDING THE MAINTENANCE OF LOW IMPACT DEVELOPMENT (LID) & NATIONAL POLLUTANTS DISCHARGE ELIMINATION SYSTEM (NPDES) BMPs

The undersigned, _____ ("Owner"), hereby certifies that it owns the real property described as follows ("Subject Property"), located in the City of Industry, County of Los Angeles, State of California:

LEGAL DESCRIPTION

See attached Exhibits A and B

ASSESSOR'S ID # 8264-009-022 and -023 PARCEL MAP NO._____PARCEL NO._____

ADDRESS: 17969 Railroad St, City of Industry, CA 91748

Owner is aware of the requirements of the City of Industry Code Section 13.16 (LID Ordinance), and National Pollutant Discharge Elimination System (NPDES) permit. The following post-construction BMP features have been installed on the Subject Property:

□ Underground chambers for detention with impermeable liner
□ Modular Wetland unit for volume-based biofiltration

The location, including GPS x-y coordinates, and type of each post-construction BMP feature installed on the Subject Property is identified on the site diagram attached hereto as Exhibit 1 (LID Site Plan).

Owner hereby covenants and agrees to maintain the above-described post-construction BMP features in a good and operable condition at all times, and in accordance with the Operation and Maintenance requirements, attached hereto as Exhibit 2 (LID Plan).

Owner further covenants and agrees that the above-described post-construction BMP features shall not be removed from the Subject Property unless and until they have been replaced with other post-construction BMP features in accordance with City of Industry Code Section 13.16 (LID Ordinance) and NPDES permit.

Owner further covenants and agrees that if Owner hereafter sells the Subject Property, Owner shall provide printed educational materials to the buyer regarding the post-construction BMP features that are located on the Subject Property, including the type(s) and location(s) of all such features, and instructions for properly maintaining all such features.

Owner makes this Covenant and Agreement on behalf of itself and its successors and assigns. This Covenant and Agreement shall run with the Subject Property and shall be binding upon owner, future owners, and their heirs, successors and assignees, and shall continue in effect until the release of this Covenant and Agreement by the City of Industry, in its sole discretion.

Owner(s): 17969 Railroad St Owner, LLC c/o Rockpoint – Ron J. Hoyl, Vice President

By:_____ Date:_____

By:_____ Date:_____

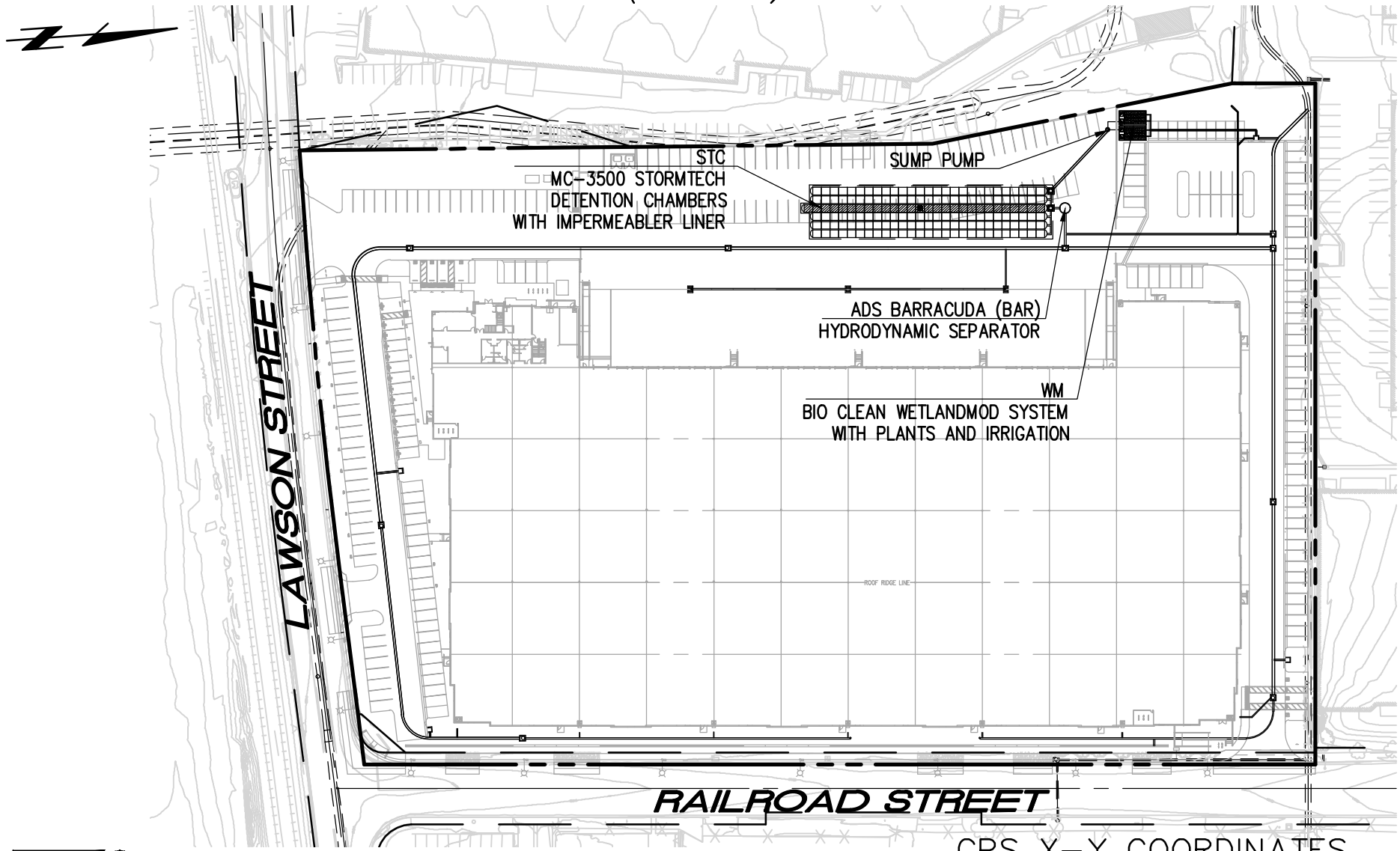
(PLEASE ATTACH NOTARY)

SCALE: 1" = 120'

EXHIBIT 1

(LID SITE MAP)

SHEET 1 OF 1



Thienes Engineering, Inc.
CIVIL ENGINEERING • LAND SURVEYING
14349 FIRESTONE BOULEVARD
LA MIRADA, CALIFORNIA 90638
PH.(714)521-4811 FAX(714)521-4173

Last Update: 1/24/24
O:\4100-4199\4186\EXHIBITS\4186Exhibit 1.dwg

GPS X-Y COORDINATES

LID BMP	X	Y
STC	33.998263	-117.912827
WM	33.998756	-117.913023
BAR	33.998586	-117.912810

Operations and Maintenance (O&M) Plan

LOW IMPACT DEVELOPMENT (LID) PLAN

for

PROJECT NAME: Railroad Street Industrial Building

APN: **8264-009-022 and 8264-009-023**

ADDRESS: **17969 Railroad Street, City of Industry, CA 91748**

Prepared on: **January 24, 2024**

BMP Applicable? Yes/No	BMP Name and BMP Implementation, Maintenance, and Inspection Procedures	Implementation, Maintenance, and Inspection Frequency and Schedule	Person or Entity with Operation & Maintenance Responsibility
Non-Structural Source Control BMPs			
Yes	**N1. Education for Property Owners, Tenants and Occupants**	The owners will provide the tenants with information concerning good housekeeping practices that contribute to protection of storm water quality. The owner will check with City and County at least once a year to obtain new or updated educational materials and provide these materials to tenants. Employees shall be trained to clean up spills and participate in ongoing maintenance. The project site will have annual employee training and new hires within one month.	17969 Railroad St Owner, LLC c/o Rockpoint 3953 Maple Avenue, Suite 300 Dallas, TX 75219 (972) 934-0100 Contact: Ron J. Hoyl
Yes	**N2. Activity Restriction**	Prohibit discharges of fertilizer, pesticides, or animal wastes to streets or storm drains. Prohibit blowing or sweeping of debris (leaf litter, grass clippings, litter, etc.) into streets or storm drains. Requirement to keep trash receptacles covered or sheltered by a roof overhang or canopy. Prohibit vehicle washing, maintenance, or repair on the premises. Activity restriction will be enforced daily.	17969 Railroad St Owner, LLC c/o Rockpoint 3953 Maple Avenue, Suite 300 Dallas, TX 75219 (972) 934-0100 Contact: Ron J. Hoyl
Yes	**N3. Common Area Landscape Management**	Maintenance of the landscaping shall be done weekly. Irrigation must be consistent with City's Water Conservation Ordinance. Fertilizer and pesticide usage will be consistent with County Management Guidelines for Use of Fertilizers and Pesticides. Irrigation system shall be inspected monthly by landscape contractor to check for over-watering, leaks, or excessive runoff to paved areas and landscaping shall be maintained weekly and maintenance contractor shall properly dispose of all landscape wastes.	17969 Railroad St Owner, LLC c/o Rockpoint 3953 Maple Avenue, Suite 300 Dallas, TX 75219 (972) 934-0100 Contact: Ron J. Hoyl
Yes	**N4. BMP Maintenance**	BMPs to be inspected and maintained as detailed in this O&M plan.	17969 Railroad St Owner, LLC c/o Rockpoint 3953 Maple Avenue, Suite 300 Dallas, TX 75219 (972) 934-0100 Contact: Ron J. Hoyl

BMP Applicable? Yes/No	BMP Name and BMP Implementation, Maintenance, and Inspection Procedures	Implementation, Maintenance, and Inspection Frequency and Schedule	Person or Entity with Operation & Maintenance Responsibility
No	**N5. Title 22 CCR Compliance**	Not applicable at the time of preparation of this LID as the project consists of an empty shell building. The LID is to be amended and shall comply with Title 22 CCR, as applicable to the business.	Not applicable
Yes	**N7. Spill Contingency Plan**	Owner/tenant will have a spill contingency plan based on individual site needs.	17969 Railroad St Owner, LLC c/o Rockpoint 3953 Maple Avenue, Suite 300 Dallas, TX 75219 (972) 934-0100 Contact: Ron J. Hoyl
No	**N8. Underground Storage Tank Compliance**	Not applicable	Not applicable
Yes	**N9. Hazardous Materials Disclosure Compliance**	Site will be in compliance with ordinances typically enforced by respective fire protection agency for the management of hazardous materials. Los Angeles County, health care agencies, and/or other appropriate agencies (i.e. Department of Toxics Substances Control is typically responsible for enforcing hazardous materials and hazardous waste handling and disposal regulations.	17969 Railroad St Owner, LLC c/o Rockpoint 3953 Maple Avenue, Suite 300 Dallas, TX 75219 (972) 934-0100 Contact: Ron J. Hoyl
Yes	**N10. Uniform Fire Code Implementation**	Site will be in compliance with article 80 of the Uniform Fire Code enforced by fire protection agency. Inspection and maintenance as necessary.	17969 Railroad St Owner, LLC c/o Rockpoint 3953 Maple Avenue, Suite 300 Dallas, TX 75219 (972) 934-0100 Contact: Ron J. Hoyl
Yes	**N11. Common Area Litter Control**	Employees, gardeners, and the property manager will help keep the site free of trash and other debris. It will be the owner's responsibility for having the site inspected weekly and cleaned as necessary.	17969 Railroad St Owner, LLC c/o Rockpoint 3953 Maple Avenue, Suite 300 Dallas, TX 75219 (972) 934-0100 Contact: Ron J. Hoyl

BMP Applicable? Yes/No	BMP Name and BMP Implementation, Maintenance, and Inspection Procedures	Implementation, Maintenance, and Inspection Frequency and Schedule	Person or Entity with Operation & Maintenance Responsibility
Yes	**N12. Contractor/Employee Training**	The owner will ensure that tenants are also familiar with onsite BMPs and necessary maintenance required of the tenants. Owner will check with City and County at least once a year to obtain new or updated educational materials and provide these materials to tenants. Employees shall be trained to clean up spills and participate in ongoing maintenance. This LID requires bi-annually employee training and new hires within 2 months.	17969 Railroad St Owner, LLC c/o Rockpoint 3953 Maple Avenue, Suite 300 Dallas, TX 75219 (972) 934-0100 Contact: Ron J. Hoyl
Yes	**N13. Housekeeping of Loading Docks.**	Keep all fluids indoors. Clean up spills immediately and keep spills from entering storm drain system. No discharges of wastewater or cleanup water from maintenance of loading docks into the storm drain system. Area shall be inspected weekly for proper containment and practices with spills cleaned up immediately and disposed of properly. Areas under "dock high" doors shall be swept daily.	17969 Railroad St Owner, LLC c/o Rockpoint 3953 Maple Avenue, Suite 300 Dallas, TX 75219 (972) 934-0100 Contact: Ron J. Hoyl
Yes	**N14. Common Area Catch Basin Inspection**	The owner/maintenance contractor will be responsible for cleaning the catch basins on-site on a regular basis prior to the storm season, no later than October 1st of each year. Catch basins and storm drain system will be cleaned at least twice a year and prior to October 1.	17969 Railroad St Owner, LLC c/o Rockpoint 3953 Maple Avenue, Suite 300 Dallas, TX 75219 (972) 934-0100 Contact: Ron J. Hoyl
Yes	**N15. Street Sweeping Private Streets and Parking Lots.**	The owner/maintenance contractor will have the private drive swept. Hosing or watering of the site will not be permitted as a method of cleaning. Parking lots and drive isles will be swept or vacuumed at least quarterly, October 1, January 1, April 1 and July 1 and as necessary. If there is any trash or debris in between the routine sweeping it will be swept or vacuumed immediately.	17969 Railroad St Owner, LLC c/o Rockpoint 3953 Maple Avenue, Suite 300 Dallas, TX 75219 (972) 934-0100 Contact: Ron J. Hoyl
No	**N17. Retail Gasoline Outlets**	Not applicable	Not applicable
Structural Source Control BMPs			

BMP Applicable? Yes/No	BMP Name and BMP Implementation, Maintenance, and Inspection Procedures	Implementation, Maintenance, and Inspection Frequency and Schedule	Person or Entity with Operation & Maintenance Responsibility
Yes	**Provide Storm Drain System Stenciling and Signage**	All storm drain inlets and catch basins shall have stenciling or labeling such as "No Dumping – Drains to Ocean" and/or other graphical icons to alert the public to the destination of pollutants discharged into stormwater. In addition, legibility of stencils and signs must be maintained. The owner/ or maintenance contractor shall inspect signage for legibility biannually.	17969 Railroad St Owner, LLC c/o Rockpoint 3953 Maple Avenue, Suite 300 Dallas, TX 75219 (972) 934-0100 Contact: Ron J. Hoyl
No	**Design and Construct Outdoor Material Storage Areas to Reduce Pollutant Introduction**	Not applicable	Not applicable
No	**Design and Construct Trash and Waste Storage Areas to Reduce Pollutant Introduction**	Paved with an impervious surface, designed not to allow run-on from adjoining areas, designed to divert drainage from adjoining roofs and pavements diverted around the area, and screened or walled to prevent off-site transport of trash.	17969 Railroad St Owner, LLC c/o Rockpoint 3953 Maple Avenue, Suite 300 Dallas, TX 75219 (972) 934-0100 Contact: Ron J. Hoyl
Yes	**Use Efficient Irrigation Systems & Landscape Design**	Irrigation of the landscaping shall be implemented as indicated on the approved landscape drawings and be consistent with the City's Water Conservation Ordinance. The irrigation system shall have rain shutoff controls as well as a programmable timer. Short irrigation cycles should be used to meet with the plant/landscaping needs. System shall be inspected (by the owner/ or maintenance contractor) once a month to check for over watering, broken sprinkler heads or lines, and excessive runoff onto paved areas.	17969 Railroad St Owner, LLC c/o Rockpoint 3953 Maple Avenue, Suite 300 Dallas, TX 75219 (972) 934-0100 Contact: Ron J. Hoyl
No	**Protect Slopes and Channels and Provide Energy Dissipation**	Not applicable	Not applicable

BMP Applicable? Yes/No	BMP Name and BMP Implementation, Maintenance, and Inspection Procedures	Implementation, Maintenance, and Inspection Frequency and Schedule	Person or Entity with Operation & Maintenance Responsibility
Yes	**Loading Docks**	Keep all fluids indoors. Clean up spills immediately and keep spills from entering storm drain system. No discharges of wastewater or cleanup water from maintenance of loading docks into the storm drain system. Area shall be inspected weekly for proper containment and practices with spills cleaned up immediately and disposed of properly. Areas under "dock high" doors shall be swept daily.	17969 Railroad St Owner, LLC c/o Rockpoint 3953 Maple Avenue, Suite 300 Dallas, TX 75219 (972) 934-0100 Contact: Ron J. Hoyl
No	**Maintenance Bays**	Not applicable	Not applicable
No	**Vehicle Wash Areas**	Not applicable	Not applicable
No	**Outdoor Processing Areas**	Not applicable	Not applicable
No	**Equipment Wash Areas.**	Not applicable	Not applicable
No	**Fueling Area**	Not applicable	Not applicable
No	**Hillside Landscaping**	Not applicable	Not applicable
No	**Wash Water Controls for Food Preparation Areas**	Not applicable	Not applicable
No	**Community Car Wash Racks**	Not applicable	Not applicable
Treatment Control BMPs (i.e. Filter Inserts, Media Filter, etc.)			
Yes	**Hydrodynamic Separator BMP**	Open access hatches or manholes. Remove gross solids from screening basket upon reaching 25% capacity. Hinges open the bottom screen panels to access sedimentation chambers. Vacuum out sedimentation chamber when any chamber reaches 25% capacity. Inspect semi-annually (by October 1st and February 1st) and maintain, upon reaching 25% capacity, through maintenance service contract with the vendor or equally qualified contractor.	17969 Railroad St Owner, LLC c/o Rockpoint 3953 Maple Avenue, Suite 300 Dallas, TX 75219 (972) 934-0100 Contact: Ron J. Hoyl
LID BMPs			

BMP Applicable? Yes/No	BMP Name and BMP Implementation, Maintenance, and Inspection Procedures	Implementation, Maintenance, and Inspection Frequency and Schedule	Person or Entity with Operation & Maintenance Responsibility
Yes	**WetlandMod**	All work to be done by the supplier or by a supplier approved contractor. Maintenance should be done semi-annually (October 1st and February 1st). Clean separation (sediment) chamber, located directly under the manhole. Replace media in pre-filtration cartridges. Media life depends on the loading conditions and can easily be replaced and disposed of without any equipment. The BioMediaGREEN filter can be ordered from the manufacturer. Replace drain down filter media. Replacement of media takes approximately 5 minutes and is performed without any equipment. Replace wetland media. The life of the media can be up to 20 years. Remove spent media with shovel or vacuum truck and replace with new media. Media can be ordered from the manufacturer. See manufacturer's maintenance requirements for additional information.	17969 Railroad St Owner, LLC c/o Rockpoint 3953 Maple Avenue, Suite 300 Dallas, TX 75219 (972) 934-0100 Contact: Ron J. Hoyl
Yes	**Sump Pump**	Maintenance should be done semi-annually (October 1st and February 1st). Verify automatic and manual operations of pump(s). Inspect floats for proper elevation and movement. Correct any obstructions. Check incoming power and amperage for proper voltage. Hose down lift station to clean pump and floats.	17969 Railroad St Owner, LLC c/o Rockpoint 3953 Maple Avenue, Suite 300 Dallas, TX 75219 (972) 934-0100 Contact: Ron J. Hoyl
Yes	**Underground Detention System**	The isolator rows shall be inspected semi-annually (by October 1st and February 1st) and cleaned by water-flush and vacuum when solids accumulate to 3" depth. The isolator rows shall be inspected for debris and sediment accumulations and maintained by a qualified technician and he/she will properly dispose of all wastes and inspect for standing water. A manhole is installed in order to inspect and maintain the inlet row. All entry into the chamber system must be done per OSHA codes to ensure operator and inspector safety.	17969 Railroad St Owner, LLC c/o Rockpoint 3953 Maple Avenue, Suite 300 Dallas, TX 75219 (972) 934-0100 Contact: Ron J. Hoyl

Responsible Party

The owner(s), **17969 Railroad St Owner, LLC c/o Rockpoint**, is aware of the maintenance responsibilities of the proposed BMPs. A funding mechanism is in place to maintain the BMPs at the frequency stated in the LID. The contact information for the entity responsible is below:

Name:	Ron J. Hoyl
Company:	17969 Railroad St Owner, LLC c/o Rockpoint
Title:	Vice President
Address:	3953 Maple Avenue, Suite 300 Dallas, TX 75219
Phone Number:	(972) 934-0100
Email:	ron@rockpoint.com

Site Plan

For locations of BMPs, refer to the LID Site Map located within Appendix B of the LID report.

RECORD OF BMP IMPLEMENTATION, MAINTENANCE, AND INSPECTION

Today's Date: _____

Name of Person Performing Activity (Printed): _____

Signature: _____

BMP Name (As Shown in O&M Plan)	Brief Description of Implementation, Maintenance, and Inspection Activity Performed

Storm Drain Signage SD-13

Design Objectives

- Maximize Infiltration
- Provide Retention
- Slow Runoff
- Minimize Impervious Land Coverage
- ☑ Prohibit Dumping of Improper Materials
- Contain Pollutants
- Collect and Convey

Description

Waste materials dumped into storm drain inlets can have severe impacts on receiving and ground waters. Posting notices regarding discharge prohibitions at storm drain inlets can prevent waste dumping. Storm drain signs and stencils are highly visible source controls that are typically placed directly adjacent to storm drain inlets.

Approach

The stencil or affixed sign contains a brief statement that prohibits dumping of improper materials into the urban runoff conveyance system. Storm drain messages have become a popular method of alerting the public about the effects of and the prohibitions against waste disposal.

Suitable Applications

Stencils and signs alert the public to the destination of pollutants discharged to the storm drain. Signs are appropriate in residential, commercial, and industrial areas, as well as any other area where contributions or dumping to storm drains is likely.

Design Considerations

Storm drain message markers or placards are recommended at all storm drain inlets within the boundary of a development project. The marker should be placed in clear sight facing toward anyone approaching the inlet from either side. All storm drain inlet locations should be identified on the development site map.

Designing New Installations

The following methods should be considered for inclusion in the project design and show on project plans:

- Provide stenciling or labeling of all storm drain inlets and catch basins, constructed or modified, within the project area with prohibitive language. Examples include “NO DUMPING

CASQA
CALIFORNIA STORMWATER QUALITY ASSOCIATION

– DRAINS TO OCEAN" and/or other graphical icons to discourage illegal dumping.

- Post signs with prohibitive language and/or graphical icons, which prohibit illegal dumping at public access points along channels and creeks within the project area.

Note - Some local agencies have approved specific signage and/or storm drain message placards for use. Consult local agency stormwater staff to determine specific requirements for placard types and methods of application.

Redeveloping Existing Installations

Various jurisdictional stormwater management and mitigation plans (SUSMP, WQMP, etc.) define "redevelopment" in terms of amounts of additional impervious area, increases in gross floor area and/or exterior construction, and land disturbing activities with structural or impervious surfaces. If the project meets the definition of "redevelopment", then the requirements stated under " designing new installations" above should be included in all project design plans.

Additional Information

Maintenance Considerations

- Legibility of markers and signs should be maintained. If required by the agency with jurisdiction over the project, the owner/operator or homeowner's association should enter into a maintenance agreement with the agency or record a deed restriction upon the property title to maintain the legibility of placards or signs.

Placement

- Signage on top of curbs tends to weather and fade.

- Signage on face of curbs tends to be worn by contact with vehicle tires and sweeper brooms.

Supplemental Information

Examples

- Most MS4 programs have storm drain signage programs. Some MS4 programs will provide stencils, or arrange for volunteers to stencil storm drains as part of their outreach program.

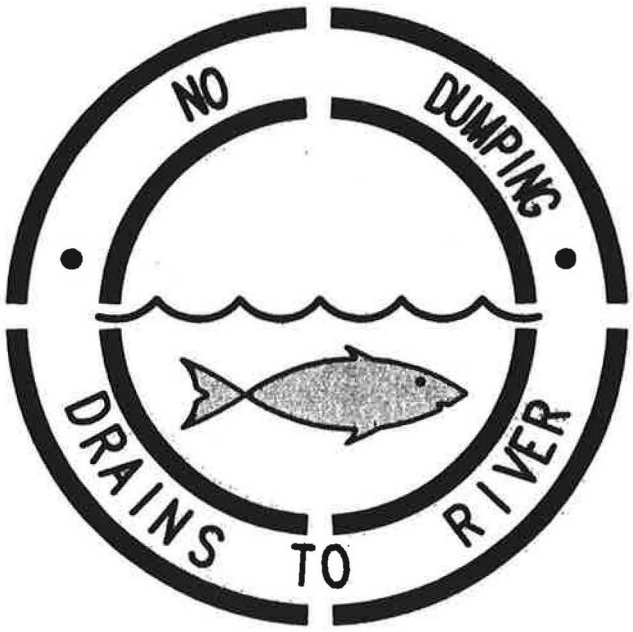
Other Resources

A Manual for the Standard Urban Stormwater Mitigation Plan (SUSMP), Los Angeles County Department of Public Works, May 2002.

Model Standard Urban Storm Water Mitigation Plan (SUSMP) for San Diego County, Port of San Diego, and Cities in San Diego County, February 14, 2002.

Model Water Quality Management Plan (WQMP) for County of Orange, Orange County Flood Control District, and the Incorporated Cities of Orange County, Draft February 2003.

Ventura Countywide Technical Guidance Manual for Stormwater Quality Control Measures, July 2002.



SAMPLE STENCIL TO BE USED NEAR GRATE AND CURB OPENING INLETS

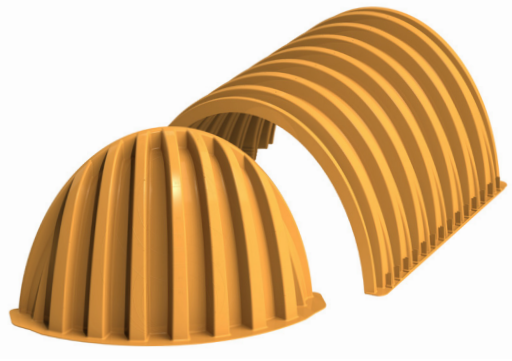
SYMBOL TO BE 24" IN DIAMETER

Thienes Engineering
CIVIL ENGINEERING • LAND SURVEYING
14349 FIRESTONE BOULEVARD
LA MIRADA, CALIFORNIA 90638
PH.(714)521-4811 FAX(714)521-4173

SAMPLE CATCH BASIN STENCIL
PER BMP SD-13

StormTech® MC-3500 Chamber

Designed to meet the most stringent industry performance standards for superior structural integrity while providing designers with a cost-effective method to save valuable land and protect water resources. The StormTech system is designed primarily to be used under parking lots, thus maximizing land usage for private (commercial) and public applications. StormTech chambers can also be used in conjunction with Green Infrastructure, thus enhancing the performance and extending the service life of these practices.



Nominal Chamber Specifications
(not to scale)

Size (L x W x H)
90” x 77” x 45”
2286 mm x 1956 mm x 1143 mm

Chamber Storage
109.9 ft³ (3.11 m³)

Min. Installed Storage*
175.0 ft³ (4.96 m³)

Weight
134 lbs (60.8 kg)

Shipping
15 chambers/pallet
7 end caps/pallet
7 pallets/truck

*Assumes a minimum of 12” (300 mm) of stone above, 9” (230 mm) of stone below chambers, 6” (150 mm) of stone between chambers/ end caps and 40% stone porosity.

Nominal End Cap Specifications
(not to scale)

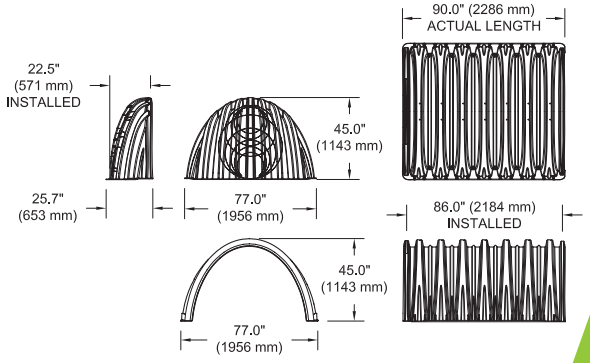
Size (L x W x H)
26.5” x 71” x 45.1”
673 mm x 1803 mm x 1145 mm

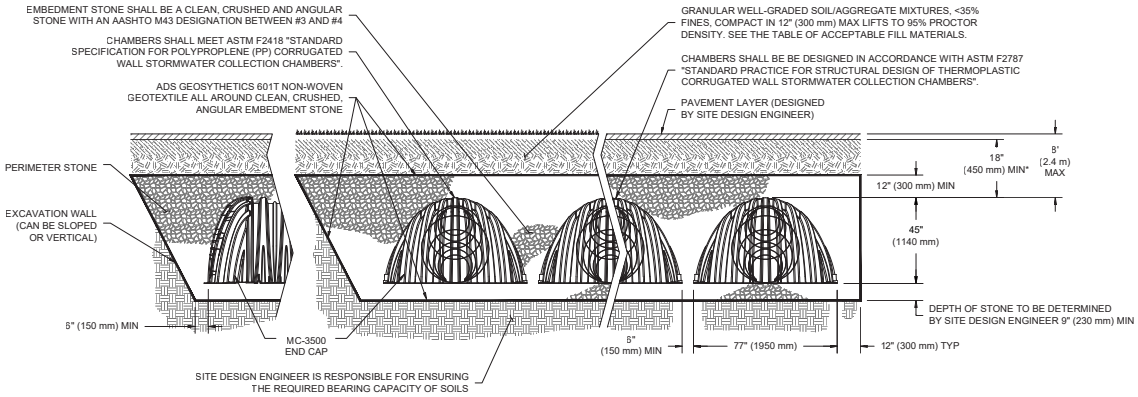
End Cap Storage
14.9 ft³ (0.42 m³)

Min. Installed Storage*
45.1 ft³ (1.28 m³)

Weight
49 lbs (22.2 kg)

*Assumes a minimum of 12” (300 mm) of stone above, 9” (230 mm) of stone below, 6” (150 mm) of stone perimeter, 6” (150 mm) of stone between chambers/ end caps and 40% stone porosity.





*MINIMUM COVER TO BOTTOM OF FLEXIBLE PAVEMENT. FOR UNPAVED INSTALLATIONS WHERE RUTTING FROM VEHICLES MAY OCCUR, INCREASE COVER TO 24" (600 mm).

ADS StormTech™

StormTech MC-3500 Specifications

Storage Volume Per Chamber

	Bare Chamber Storage ft³ (m³)	Chamber and Stone Foundation Depth in. (mm)			
		9 in (230 mm)	12 in (300 mm)	15 in (375 mm)	18 in (450 mm)
Chamber	109.9 (3.11)	175.0 (4.96)	179.9 (5.09)	184.9 (5.24)	189.9 (5.38)
End Cap	14.9 (0.42)	45.1 (1.28)	46.6 (1.32)	48.3 (1.37)	49.9 (1.41)

Note: Assumes 6" (150 mm) row spacing, 40% stone porosity, 12" (300 mm) stone above and includes the bare chamber/end cap volume.

Amount of Stone Per Chamber

English Tons (yds³)	Stone Foundation Depth			
	9 in	12 in	15 in	18 in
Chamber	8.5 (6.0)	9.1 (6.5)	9.7 (6.9)	10.4 (7.4)
End Cap	3.9 (2.8)	4.1 (2.9)	4.3 (3.1)	4.5 (3.2)
Metric Kilograms (m³)	**230 mm**	**300 mm**	**375 mm**	**450 mm**
Chamber	7711 (4.6)	8255 (5.0)	8800 (5.3)	9435 (5.7)
End Cap	3538 (2.1)	3719 (2.2)	3901 (2.4)	4082 (2.5)

Note: Assumes 12" (300 mm) of stone above and 6" (150 mm) row spacing and 6" (150 mm) of perimeter stone in front of end caps.

Volume Excavation Per Chamber yd³ (m³)

	Stone Foundation Depth			
	9 in (230 mm)	12 in (300 mm)	15 in (375mm)	18 in (450 mm)
Chamber	11.9 (9.1)	12.4 (9.5)	12.8 (9.8)	13.3 (10.2)
End Cap	4.0 (3.1)	4.1 (3.3)	4.3 (3.3)	4.4 (3.4)

Note: Assumes 6" (150 mm) of separation between chamber rows and 24" (600 mm) of cover. The volume of excavation will vary as depth of cover increases.

ADS StormTech products, manufactured in accordance with ASTM F2418 or ASTMF2922, comply with all requirements in the Build America, Buy America (BABA) Act.

Working on a project?
Visit us at adspipe.com/stormtech and utilize the Design Tool

ADS StormTech™

adspipe.com
800-821-6710

Isolator® Row Plus
O&M Manual

ADS StormTech™

The Isolator® Row Plus

Introduction

An important component of any Stormwater Pollution Prevention Plan is inspection and maintenance. The StormTech Isolator Row Plus is a technique to inexpensively enhance Total Suspended Solids (TSS) and Total Phosphorus (TP) removal with easy access for inspection and maintenance.

The Isolator Row Plus

The Isolator Row Plus is a row of StormTech chambers, either SC-160, SC-310, SC-310-3, SC-740, DC-780, MC-3500 or MC-7200 models, that is surrounded with filter fabric and connected to a closely located manhole for easy access. The fabric-wrapped chambers provide for sediment settling and filtration as stormwater rises in the Isolator Row Plus and passes through the filter fabric. The open bottom chambers and perforated sidewalls (SC-310, SC- 310-3 and SC-740 models) allow stormwater to flow both vertically and horizontally out of the chambers. Sediments are captured in the Isolator Row Plus protecting the adjacent stone and chambers storage areas from sediment accumulation.

ADS geotextile fabric is placed between the stone and the Isolator Row Plus chambers. The woven geotextile provides a media for stormwater filtration, a durable surface for maintenance, prevents scour of the underlying stone and remains intact during high pressure jetting. A non-woven fabric is placed over the chambers to provide a filter media for flows passing through the chamber's sidewall. The non-woven fabric is not required over the SC-160, DC-780, MC-3500 or MC-7200 models as these chambers do not have perforated side walls.

The Isolator Row Plus is designed to capture the "first flush" runoff and offers the versatility to be sized on a volume basis or a flow-rate basis. An upstream manhole provides access to the Isolator Row Plus and includes a high/low concept such that stormwater flow rates or volumes that exceed the capacity of the Isolator Row Plus bypass through a manifold to the other chambers. This is achieved with an elevated bypass manifold or a high-flow weir. This creates a differential between the Isolator Row Plus row of chambers and the manifold to the rest of the system, thus allowing for settlement time in the Isolator Row Plus. After Stormwater flows through the Isolator Row Plus and into the rest of the chamber system it is either exfiltrated into the soils below or passed at a controlled rate through an outlet manifold and outlet control structure.

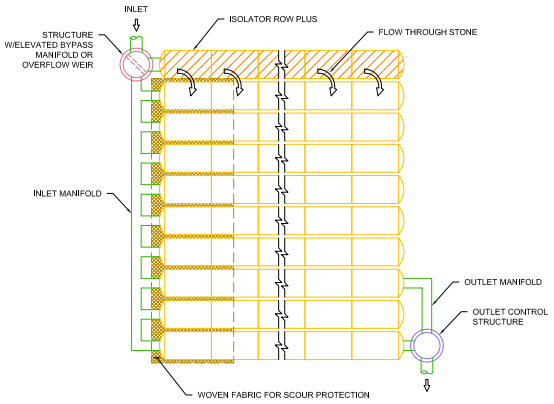
The Isolator Row FLAMP™ (patent pending) is a flared end ramp apparatus attached to the inlet pipe on the inside of the chamber end cap. The FLAMP provides a smooth transition from pipe invert to fabric bottom. It is configured to improve chamber function performance by enhancing outflow of solid debris that would otherwise collect at the chamber's end. It also serves to improve the fluid and solid flow into the access pipe during maintenance and cleaning and to guide cleaning and inspection equipment back into the inlet pipe when complete.

The Isolator Row Plus may be part of a treatment train system. The treatment train design and pretreatment device selection by the design engineer is often driven by regulatory requirements. Whether pretreatment is used or not, StormTech recommend using the Isolator Row Plus to minimize maintenance requirements and maintenance costs.

Note: *See the StormTech Design Manual for detailed information on designing inlets for a StormTech system, including the Isolator Row Plus.*

Looking down the Isolator Row PLUS from the manhole opening, ADS PLUS Fabric is shown between the chamber and stone base.

StormTech Isolator Row PLUS with Overflow Spillway (not to scale)



Isolator Row Plus Inspection/Maintenance

Inspection

The frequency of inspection and maintenance varies by location. A routine inspection schedule needs to be established for each individual location based upon site specific variables. The type of land use (i.e. industrial, commercial, residential), anticipated pollutant load, percent imperviousness, climate, etc. all play a critical role in determining the actual frequency of inspection and maintenance practices.

At a minimum, StormTech recommends annual inspections. Initially, the Isolator Row Plus should be inspected every 6 months for the first year of operation. For subsequent years, the inspection should be adjusted based upon previous observation of sediment deposition.

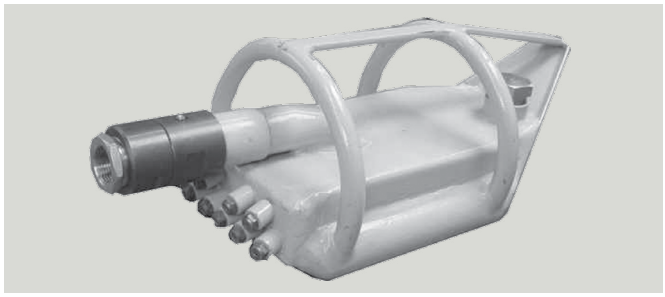
The Isolator Row Plus incorporates a combination of standard manhole(s) and strategically located inspection ports (as needed). The inspection ports allow for easy access to the system from the surface, eliminating the need to perform a confined space entry for inspection purposes.

If upon visual inspection it is found that sediment has accumulated, a stadia rod should be inserted to determine the depth of sediment. When the average depth of sediment exceeds 3 inches throughout the length of the Isolator Row Plus, clean-out should be performed.

Maintenance

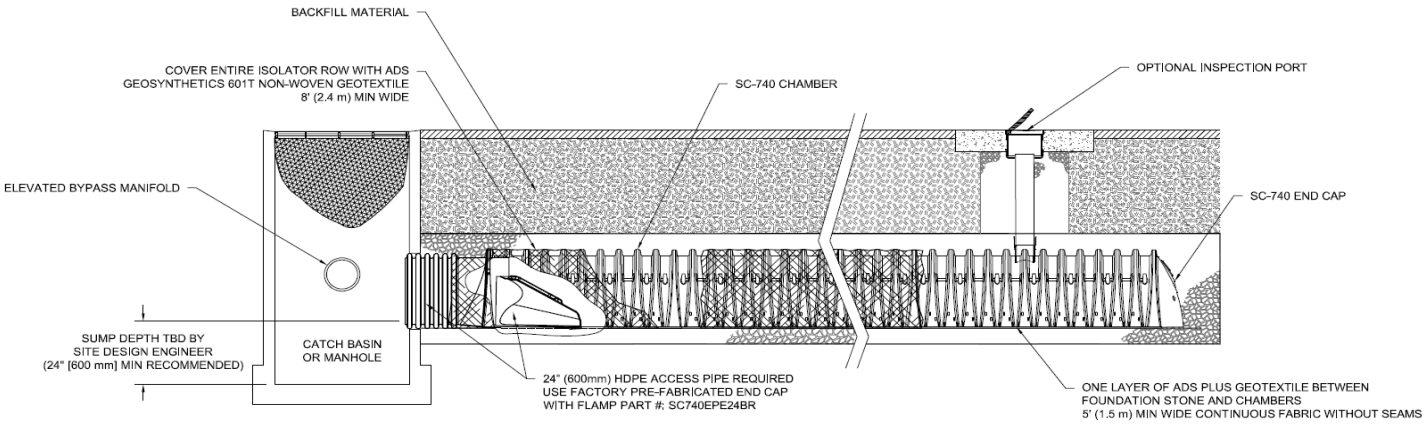
The Isolator Row Plus was designed to reduce the cost of periodic maintenance. By "isolating" sediments to just one row, costs are dramatically reduced by eliminating the need to clean out each row of the entire storage bed. If inspection indicates the potential need for maintenance, access is provided via a manhole(s) located on the end(s) of the row for cleanout. If entry into the manhole is required, please follow local and OSHA rules for a confined space entries.

Maintenance is accomplished with the JetVac process. The JetVac process utilizes a high pressure water nozzle to propel itself down the Isolator Row Plus while scouring and suspending sediments. As the nozzle is retrieved, the captured pollutants are flushed back into the manhole for vacuuming. Most sewer and pipe maintenance companies have vacuum/JetVac combination vehicles. Selection of an appropriate JetVac nozzle will improve maintenance efficiency. Fixed nozzles designed for culverts or large diameter pipe cleaning are preferable. Rear facing jets with an effective spread of at least 45" are best. StormTech recommends a maximum nozzle pressure of 2000 psi be utilized during cleaning. JetVac reels can vary in length. For ease of maintenance, ADS recommends Isolator Row Plus lengths up to 200' (61 m). **The JetVac process shall only be performed on StormTech Isolator Row Plus that have ADS Plus Fabric (as specified by StormTech) over their angular base stone.**



StormTech Isolator Row PLUS (*not to scale*)

Note: *Non-woven fabric is only required over the inlet pipe connection into the end cap for SC-160LP, DC-780, MC-3500 and MC-7200 chamber models and is not required over the entire Isolator Row PLUS.*



Isolator Row Plus Step By Step Maintenance Procedures

Step 1

Inspect Isolator Row Plus for sediment.

A) Inspection ports (if present)
- i. Remove lid from floor box frame
- ii. Remove cap from inspection riser
- iii. Using a flashlight and stadia rod,measure depth of sediment and record results on maintenance log.
- iv. If sediment is at or above 3 inch depth, proceed to Step 2. If not, proceed to Step 3.

B) All Isolator Row Plus
- i. Remove cover from manhole at upstream end of Isolator Row Plus
- ii. Using a flashlight, inspect down Isolator Row Plus through outlet pipe
  1. Mirrors on poles or cameras may be used to avoid a confined space entry
  2. Follow OSHA regulations for confined space entry if entering manhole
- iii. If sediment is at or above the lower row of sidewall holes (approximately 3 inches), proceed to Step 2.
  If not, proceed to Step 3.

Step 2

Clean out Isolator Row Plus using the JetVac process.

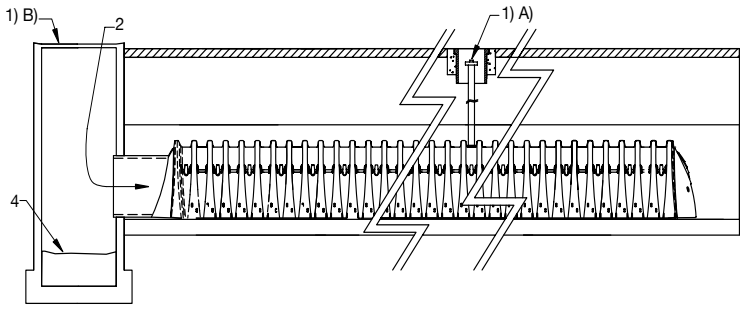
A) A fixed floor cleaning nozzle with rear facing nozzle spread of 45 inches or more is preferable
B) Apply multiple passes of JetVac until backflush water is clean
C) Vacuum manhole sump as required

Step 3

Replace all caps, lids and covers, record observations and actions.

Step 4

Inspect & clean catch basins and manholes upstream of the StormTech system.



Sample Maintenance Log

Date	Stadia Rod Readings		Sedi-ment Depth (1)–(2)	Observations/Actions	Inspector
	Fixed point to chamber bottom (1)	Fixed point to top of sediment (2)			
3/15/11	6.3 ft	none		New installation. Fixed point is CI frame at grade	DJM
9/24/11		6.2	0.1 ft	Some grit felt	SM
6/20/13		5.8	0.5 ft	Mucky feel, debris visible in manhole and in Isolator Row PLUS, maintenance due	NV
7/7/13	6.3 ft		0	System jetted and vacuumed	DJM

adspipe.com
800-821-6710

PSI Pacific Southwest Industries

ENGINEERED - PUMPS/FLUID HANDLING & DISPOSAL SYSTEMS - PACKAGED LIFT STATIONS

LIFT STATION REQUIRED MAINTENANCE

The lift station should be inspected twice a year for proper operation, and should be checked for overabundance of solid matter such as grease and soap buildup.

Proper operation and inspection would include the following:

1) Automatic operation of the system by float activation. One pump starting at lead on levels, second pump starting at high level conditions; manual operation by use of the selector switches.

2) Inspect floats for proper elevation and for proper movement. Correct any obstructions.

3) Check incoming power for proper voltage. Check voltage at motor connections.

4) Check amperage of each motor.

5) Hose down lift station to clean the walls of the wet well, pumps and floats.

MECHANICAL SEAL INSPECTION OF PUMPS

Inspection of the mechanical seals should be done every two years.

The inspection will include the following:

Pull pump out of wet well. Remove oil seal plug and inspect the oil for clarity. Clear oil indicates no water intrusion and chamber is to be topped off with 30 weight turbine oil. If oil is cloudy the mechanical seal and oil needs to be replaced.

Note: Your lift station is designed to pump raw unscreened sewage. Refrain from putting the following into your sewage system: tampons, feminine napkins, condoms, handy wipes, baby wipes, paper towels, diapers, plastic bags, q-tips, etc., and food grease. Although grease will be pumped, grease will cause problems eventually and will not be covered under the manufacturer's warranty. Dispose of the above items in a trash can.

PSI recommends that preventive maintenance and service be performed by a qualified technician.

Any question regarding your lift station should be directed to Scott Richardson at 800-358-9095.

P O Box 520 Lake Elsinore, CA 92531 – 18541 Collier Ave., Lake Elsinore, CA 92530
(800) 358-9095 (909) 674-2144 fax (909) 674-9444 CSL #583052
www.psipumps.com Email: info@psipumps.com

Bio Clean

A Forterra Company

WetlandMod® Separator

A Stormwater Biofiltration Solution

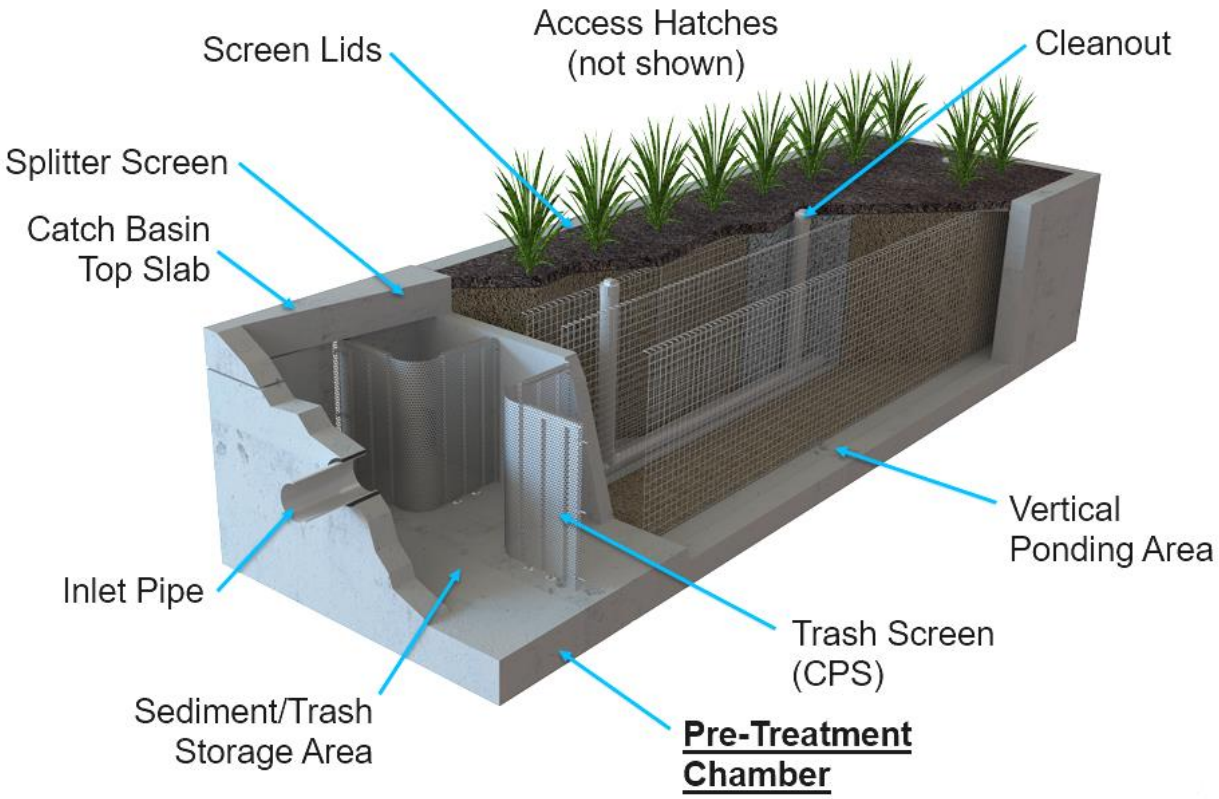
OPERATION & MAINTENANCE MANUAL

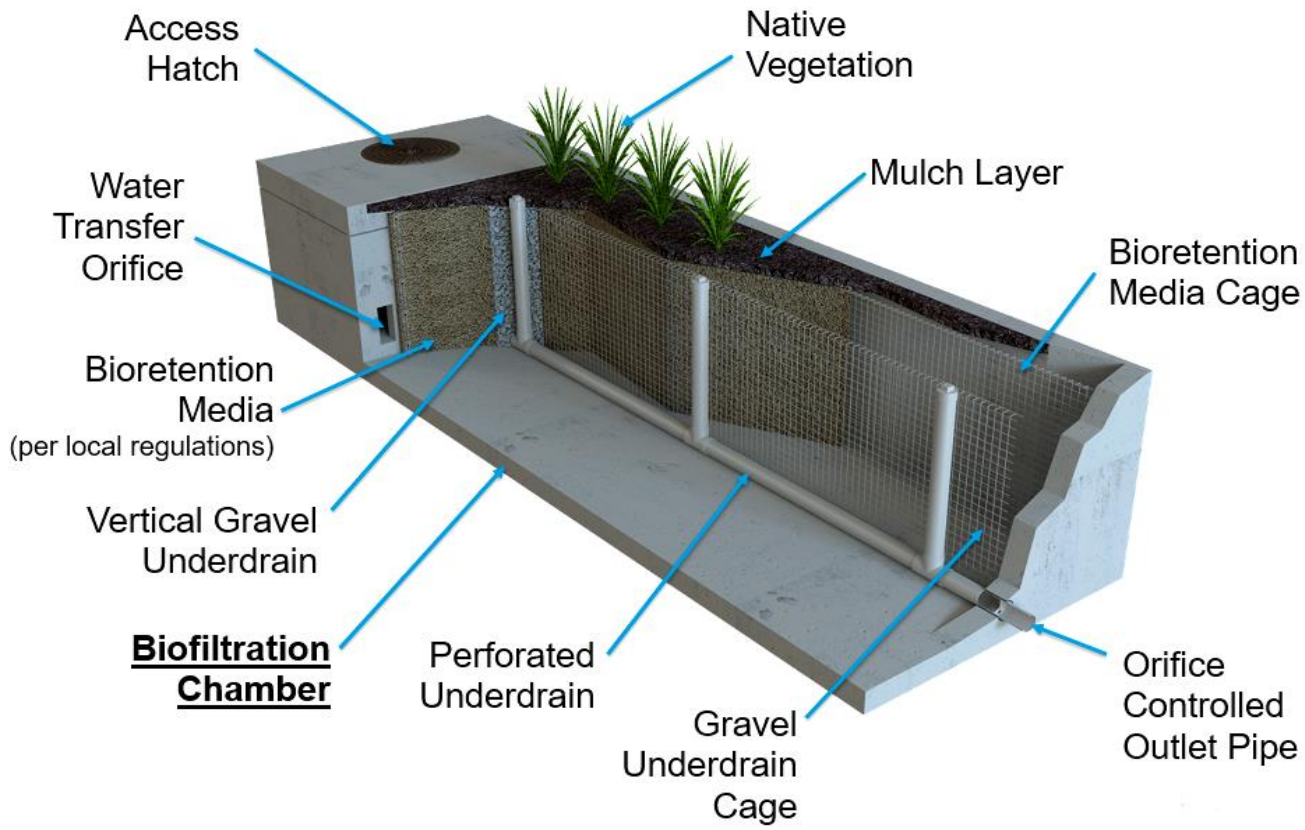
Inspection Guidelines for WetlandMod

Inspection Summary

- Inspect Pre-Treatment Chamber – average inspection interval is 6 to 12 months.
  - (5-*minute average inspection time*).
- Inspect Biofiltration Chamber – average inspection interval is 6 to 12 months.
  - (1*0-minute average inspection time*).
- NOTE: Pollutant loading varies greatly from site to site and no two sites are the same. Therefore, the first year requires inspection monthly during the wet season and every other month during the dry season in order to observe and record the amount of pollutant loading the system is receiving.

System Diagram





Inspection Overview

As with all stormwater BMPs inspection and maintenance on the WetlandMod is necessary. Stormwater regulations require that all BMPs be inspected and maintained to ensure they are operating as designed to allow for effective pollutant removal and provide protection to receiving water bodies. It is recommended that inspections be performed multiple times during the first year to assess the site specific loading conditions. This is recommended because pollutant loading and pollutant characteristics can vary greatly from site to site. Variables such as nearby soil erosion or construction sites, winter sanding on roads, amount of daily traffic and land use can increase pollutant loading on the system. The first year of inspections can be used to set inspection and maintenance intervals for subsequent years to ensure appropriate maintenance is provided. Without appropriate maintenance a BMP will exceed its storage capacity which can negatively affect its continued performance in removing and retaining captured pollutants.

Inspection Equipment:

Following is a list of equipment to allow for simple and effective inspection of the WetlandMod:

- WetlandMod Inspection Form
- Flashlight
- Manhole hook or appropriate tools to remove access hatches and covers (if applicable)
- Appropriate traffic control signage and procedures
- Measuring pole and/or tape measure.
- Protective clothing and eye protection.

- Note: entering a confined space requires appropriate safety and certification. It is generally not required for routine inspections of the system.

Inspection Steps

The core to any successful stormwater BMP maintenance program is routine inspections. The inspection steps required on the WetlandMod are quick and easy. As mentioned above the first year should be seen as the maintenance interval establishment phase. During the first year more frequent inspections should occur in order to gather loading data and maintenance requirements for that specific site. This information can be used to establish a base for long-term inspection and maintenance interval requirements.

The WetlandMod can be inspected though visual observation without entry into the system. All necessary pre-inspection steps must be carried out before inspection occurs, especially traffic control and other safety measures to protect the inspector and near-by pedestrians from any dangers associated with an open access. Once the top tray is removed the following apply:

- Prepare the inspection form by writing in the necessary information including project name, location, date & time, unit number and other info (see inspection form).
- Observe the inside of the pre-treatment chamber and biofiltration chamber once the access hatch is removed. If minimal light is available and vision into the unit is impaired utilize a flashlight to see inside the system and all of its chambers.
- Look for any out of the ordinary obstructions in the inflow pipe, around the trash screen (CPS), on the surface of the media, or in the drain down riser. Write down any observations on the inspection form.
- Through observation and/or digital photographs estimate the amount of trash, debris and sediment accumulated in the chamber. Utilizing a tape measure or measuring stick estimate the amount of trash, debris and sediment on the floor of each chamber. Record this depth on the inspection form.
- Finalize inspection report for analysis by the maintenance manager to determine if maintenance is required.

Maintenance Indicators

Based upon observations made during inspection, maintenance of the system may be required based on the following indicators:

- Missing or damaged internal components.
- Obstructions in the system or its inlet or outlet.

- Excessive accumulation of floatables more than 12” in depth in the pre-treatment chamber.
- Excessive accumulation of sediment of more than 6” in depth in the biofiltration chamber.
- Excessive build up on the vertical surface of the biofiltration media.
- Overgrown vegetation.
- Storage area around media cage has standing water 72 hours after a storm event.

Inspection Notes

1. Following maintenance and/or inspection, it is recommended the maintenance operator prepare a maintenance/inspection record. The record should include any maintenance activities performed, amount and description of debris collected, and condition of the system and its various filter mechanisms.

2. The owner should keep maintenance/inspection record(s) for a minimum of five years from the date of maintenance. These records should be made available to the governing municipality for inspection upon request at any time.

3. Transport all debris, trash, organics and sediments to approved facility for disposal in accordance with local and state requirements.

4. Entry into chambers may require confined space training based on state and local regulations.

5. No fertilizer shall be used in the Biofiltration Media.

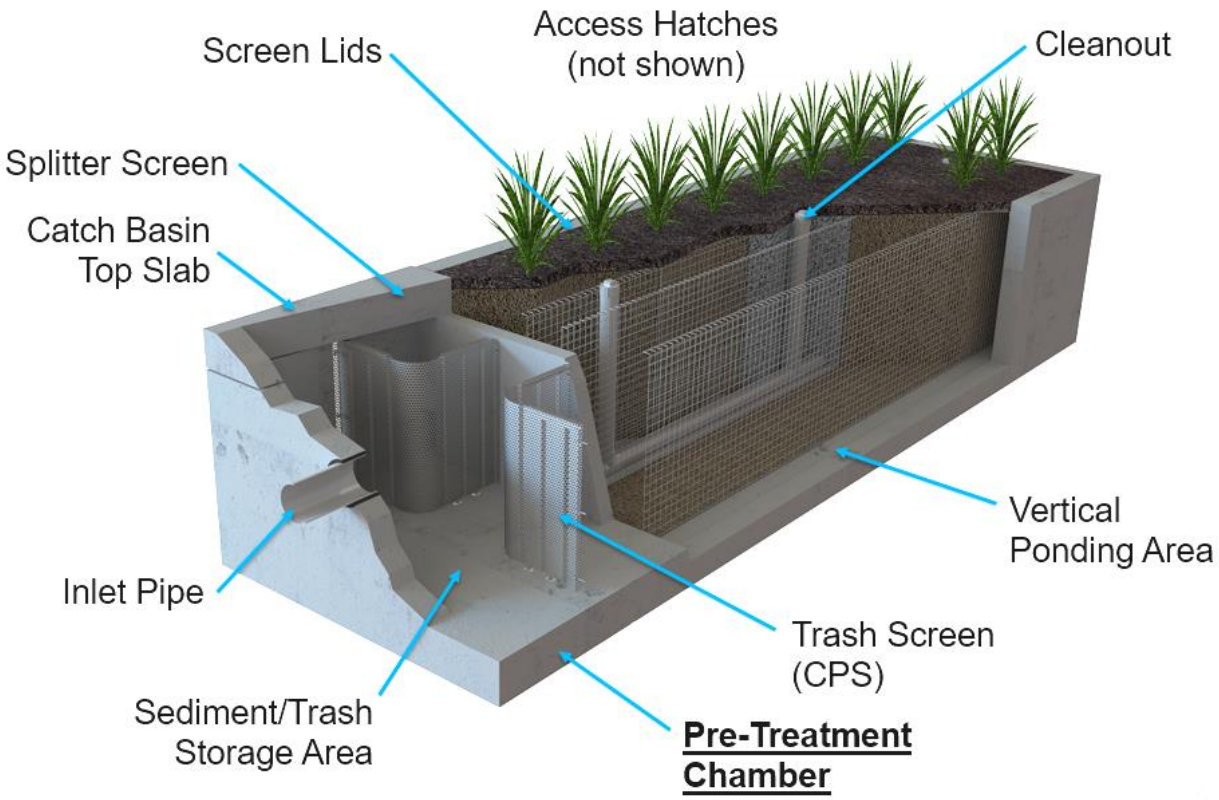
6. Irrigation should be provided as recommended by manufacturer and/or landscape architect. Amount of irrigation required is dependent on plant species. Some plants may not require irrigation after initial establishment.

Maintenance Guidelines for WetlandMod

Maintenance Summary

- Remove Sediment and Trash from Pre-Treatment Chamber – average maintenance interval is 6 to 12 months.
  - (*15 minute average service time*).
- Removed Sediment and Pressure Wash Biofiltration Media Surface – average maintenance interval 12 to 24 months.
  - (*15-60 minutes depending on size of system).*
- Trim Vegetation – average maintenance interval is 6 to 12 months.
  - (*Service time varies*).

System Diagram



Maintenance Overview

The time has come to maintain your WetlandMod. To ensure successful and efficient maintenance on the system we recommend the following. The WetlandMod can be maintained by removing the access hatches. The mulch over the top tray should be removed prior to removing the top hatch over the biofiltration chamber. All necessary pre-maintenance steps must be carried out before maintenance occurs, especially traffic control and other safety measures to protect the inspector and near-by pedestrians from any dangers associated with an open access hatch or manhole. Once traffic control has been set up per local and state regulations and access covers have been safely opened the maintenance process can begin. It should be noted that no maintenance activities require confined space entry but if entry is done all confined space requirements must be strictly followed before entry into the system. In addition the following is recommended:

- Prepare the maintenance form by writing in the necessary information including project name, location, date & time, unit number and other info (see maintenance form).
- Set up all appropriate safety and cleaning equipment.
- Ensure traffic control is set up and properly positioned.
- Prepare a pre-checks (OSHA, safety, confined space entry) are performed.

Maintenance Equipment

Following is a list of equipment required for maintenance of the WetlandMod:

- WetlandMod Maintenance Form
- Manhole hook or appropriate tools to access hatches and covers (if applicable)
- Protective clothing, flashlight and eye protection.
- Vacuum assisted truck with pressure washer.
- Replacement pre-filter wraps (order from manufacturer).

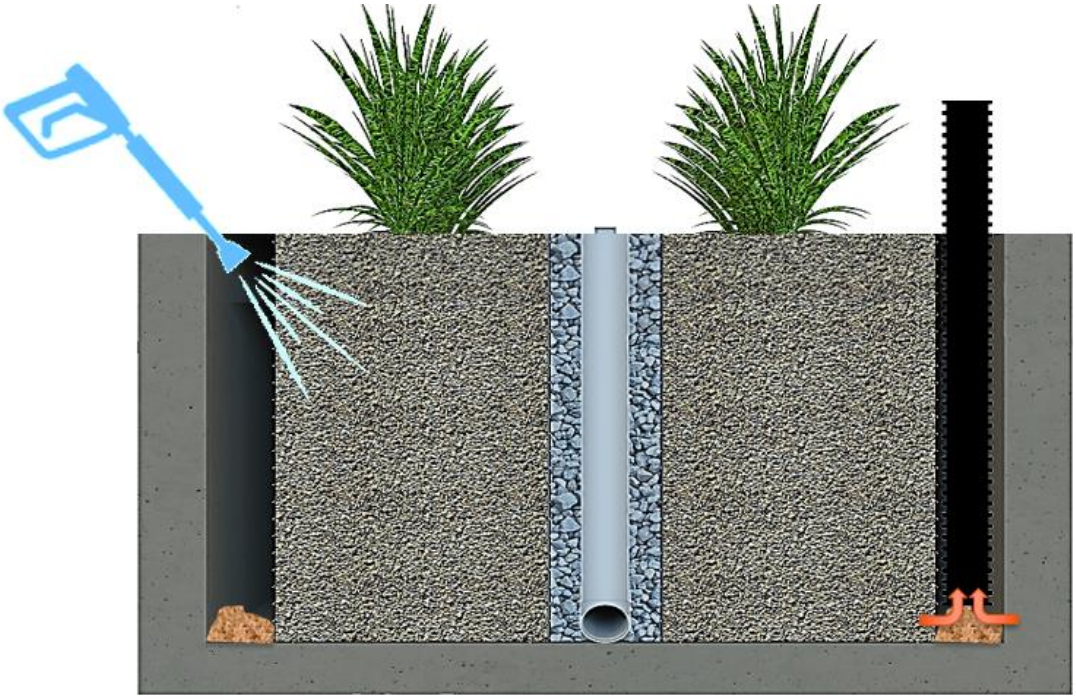
Maintenance Steps

1. Pre-Treatment Chamber (first chamber that contains trash screens)

   A. Remove access hatch and position vacuum truck accordingly.
   B. With a pressure washer spray down pollutants accumulated on trash screens.
   C. Vacuum out all accumulated pollutants including trash, debris and sediments. Be sure to vacuum the floor, screens, and walls along with outlet side of screens.

2. Biofiltration Chamber (vegetated chamber)

   A. Remove the mulch along each side of the unit. Rake away from side walls. Remove top covers to gain access to void areas.
   B. Pressure wash off the vertical surface of the media be using a pressure washer and a vacuum hose to collect and material on the floor around the cage. Pressure wash down into the media to allow accumulated sediments to flow back into the surrounding perimeter separation area for collection with the vac hose.
   C. Replace the top covers.
   D. Trim any vegetation that is overgrown.
   E. Replace the mulch to cover the top covers.



Maintenance Notes

1. Transport all debris, trash, organics and sediments to approved facility for disposal in accordance with local and state requirements.
2. Entry into chambers may require confined space training based on state and local regulations.
3. No fertilizer shall be used in the Biofiltration Chamber.
4. Irrigation should be provided as recommended by manufacturer and/or landscape architect. Amount of irrigation required is dependent on plant species. Some plants may not require irrigation after initial establishment

Inspection Form

Bio Clean, A Forterra Company
P. 760.433-7640
F. 760-433-3176
E. stormwater@forterrabp.com

www.biocleanenvironmental.com

Inspection Report
WetlandMod System

Project Name _____

Project Address _____
(city) (Zip Code)

Owner / Management Company _____

Contact _____ Phone ( ) –

Inspector Name _____ Date ____/____/____ Time _____ AM / PM

Type of Inspection ☐ Routine ☐ Follow Up ☐ Complaint ☐ Storm Storm Event in Last 72-hours? ☐ No ☐ Yes

Weather Condition _____ Additional Notes _____

For Office Use Only
(Reviewed By)
(Date)
Office personnel to complete section to the left.

Inspection Checklist

WetlandMod System: _____ Size (Model): _____

Structural Integrity:	**Yes**	**No**	**Comments**
Damage to pre-treatment access cover (manhole cover/grate) or cannot be opened using normal lifting pressure?			
Damage to discharge chamber access cover (manhole cover/grate) or cannot be opened using normal lifting pressure?			
Does the MWS unit show signs of structural deterioration (cracks in the wall, damage to frame)?			
Is the inlet/outlet pipe or drain down pipe damaged or otherwise not functioning properly?			
Working Condition:			
Is there evidence of illicit discharge or excessive oil, grease, or other automobile fluids entering and clogging the unit?			
Is there standing water in inappropriate areas after a dry period?			
Is the filter insert (if applicable) at capacity and/or is there an accumulation of debris/trash on the shelf system?			
Does the depth of sediment/trash/debris suggest a blockage of the inflow pipe, bypass or cartridge filter? If yes, specify which one in the comments section. Note depth of accumulation in in pre-treatment chamber.			Depth:
Does the cartridge filter media need replacement in pre-treatment chamber and/or discharge chamber?			Chamber:
Any signs of improper functioning in the discharge chamber? Note issues in comments section.			
Other Inspection Items:			
Is there an accumulation of sediment/trash/debris in the wetland media (if applicable)?			
Is it evident that the plants are alive and healthy (if applicable)? Please note Plant Information below.			
Is there a septic or foul odor coming from inside the system?			

Waste:	**Yes**	**No**
Sediment / Silt / Clay		
Trash / Bags / Bottles		
Green Waste / Leaves / Foliage		

Recommended Maintenance	
No Cleaning Needed	
Schedule Maintenance as Planned	
Needs Immediate Maintenance	

Plant Information	
Damage to Plants	
Plant Replacement	
Plant Trimming	

Additional Notes: _____

398 Via El Centro, Oceanside, CA 92058 P (760) 433-7640 F (760) 433-3176

Maintenance Report

Bio Clean, A Forterra Company
P. 760.433-7640
F. 760-433-3176
E. stormwater@forterrabp.com

www.biocleanenvironmental.com

Cleaning and Maintenance Report
WetlandMod System

Project Name _____

Project Address _____
(city) (Zip Code)

Owner / Management Company _____

Contact _____ Phone ( ) –

Inspector Name _____ Date ____/____/____ Time _____ AM / PM

Type of Inspection ☐ Routine ☐ Follow Up ☐ Complaint ☐ Storm Storm Event in Last 72-hours? ☐ No ☐ Yes

Weather Condition _____ Additional Notes _____

For Office Use Only
(Reviewed By)
(Date)
Office personnel to complete section to the left.

Site Map #	GPS Coordinates of Insert	Manufacturer / Description / Sizing	Trash Accumulation	Foliage Accumulation	Sediment Accumulation	Total Debris Accumulation	Condition of Media 25/50/75/100 (will be changed @ 75%)	Operational Per Manufactures' Specifications (If not, why?)
	Lat: Long:	WM Catch Basins						
		WM Sedimentation Basin						
		CPS Filter Condition						
		Plant Condition						
		Drain Down Media Condition						
		Discharge Chamber Condition						
		Drain Down Pipe Condition						
		Inlet and Outlet Pipe Condition						

Comments:

398 Via El Centro, Oceanside, CA 92058 P. 760.433.7640 F. 760.433.3176

ADS® Barracuda™ Max

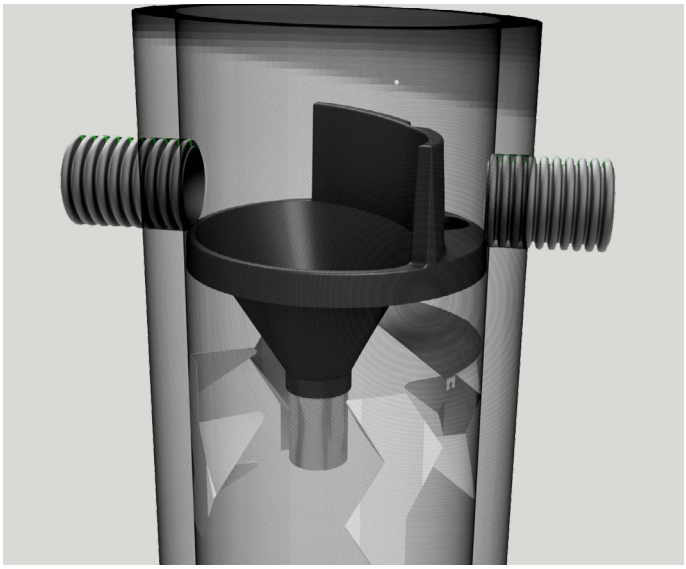
The Barracuda Max is market-changing stormwater quality technology. This high-performance vortex hydrodynamic separator is designed to remove total suspended solids in order to protect our precious receiving waters. The Barracuda Max is also an outstanding value that offers multiple pipe configurations, and quick installation. The “Max” version of the Barracuda is built on the base platform of the original ADS Barracuda with improved removal efficiencies and installation components.

Features

- Single manhole design
- No elevation loss between the inlet and outlet
- Variable inlet/outlet angle configurations (not just 180 degree orientation)
- Internal bypass for inline installation (where applicable)
- Revolutionary, patent-pending “teeth” mitigate turbulence in the sump area to prevent re-suspension of captured contaminants and an added deflector plate and bowl extension enhance the unit’s removal capabilities

Benefits

- Internal components are in stock for quick delivery
- The S3, S4, S6, and S8 can be installed in a standard 36” (900 mm), 48” (1200 m), 72” (1800 m), and 96” (2400 m) precast manhole, respectively
- The S3 & S4 can be provided factory installed within a 36” (900 mm) and 48” (1200 mm) ADS HP manhole and delivered to the jobsite
- The Barracuda Max “teeth” and deflector plate apparatus are fabricated and designed for quick and easy field assembly
- Designed for easy maintenance using a vacuum truck or similar equipment.
- Inspection and maintenance are performed from the surface with no confined space entry



ADS™

Barrucuda Specification

Materials and Design

- Concrete Structures: Designed for H-20 traffic loading and applicable soil loads or as otherwise determined by a Licensed Professional Engineer. The materials and structural design of the devices shall be per ASTM C857 and ASTM C858.
- 36” (900 mm) and 48” (1200 mm) HP Manhole Structures: Made from an impact modified copolymer polypropylene meeting the material requirements of ASTM F2764. The eccentric cone reducer shall be manufactured from polyethylene material meeting ASTM D3350 cell class 213320C. Gaskets shall be made of material meeting the requirements of ASTM F477.
- Separator internals shall be substantially constructed of stainless steel, polyethylene or other thermoplastic material approved by the manufacturer.

Performance

- The stormwater treatment unit shall be an inline unit capable of conveying 100% of the design peak flow. If peak flow rates exceed maximum hydraulic rate, the unit shall be installed offline.
- The Barracuda Max unit shall be designed to remove at least 80% of the suspended solids on an annual aggregate removal basis. Said removal shall be based on full-scale third party testing using OK-110 media gradation or equivalent and 300 mg/L influent concentration. Said full scale testing shall have included sediment capture based on actual total mass collected by the stormwater treatment unit.

  - OR -

  The Barracuda Max unit shall be designed to remove at least 50% of TSS using a media mix with d_{50}=75 micron and 200 mg/L influent concentration.

  - OR -

  The Barracuda Max unit shall be designed to remove at least 50% of TSS per current NJDEP/NJCAT HDS protocol.
- The stormwater treatment unit internals shall consist of (1) separator cone assembly, and (1) sump assembly, which includes the “teeth”.

Barracuda Max Model	Manhole Diameter	NJDEP (50% removal)	OK-110 (80% removal)
S3	36” (900 mm)	0.85 CFS (24.1 L/s)	0.86 CFS (24.1 L/s)
S4	48” (1200 mm)	1.52 CFS (43.0 L/s)	1.52 CFS (43.0 L/s)
S6	72” (1800 mm)	3.40 CFS (96.3 L/s)	3.42 CFS (96.8 L/s)
S8	96” (2400 mm)	6.08 CFS (172.2 L/s)	6.08 CFS (172.2 L/s)

* Peak bypass flows are dependent on final design

Installation

Installation of the stormwater treatment unit(s) shall be performed per manufacturer’s installation instructions. Such instructions can be obtained by calling Advanced Drainage Systems at 800-821-6710 or by logging on to www.adspipe.com.

adspipe.com
800-821-6710

Barracuda® Max & Barracuda Maintenance Guide

One of Barracuda's advantages is the ease of maintenance. Like any system that collects pollutants, the Barracuda must be maintained for continued effectiveness. Maintenance is a simple procedure performed using a vacuum truck or similar equipment. The systems were designed to minimize the volume of water removed during routine maintenance, reducing disposal costs.

Contractors can access the pollutants stored in the manhole through the manhole cover. This allows them to gain vacuum hose access to the bottom of the manhole to remove sediment and trash. There is no confined space entry necessary for inspection or maintenance.

The entire maintenance procedure typically takes 2 to 4 hours, depending on the system's size, the captured material, and the vacuum truck's capacity.

Local regulations may apply to the maintenance procedure. Safe and legal disposal of pollutants is the responsibility of the maintenance contractor. Maintenance should be performed only by a qualified contractor.

Inspection and Cleaning Cycle

Periodic inspection is needed to determine the need for and frequency of maintenance. You should begin inspecting as soon as construction is complete and then on an annual basis. Typically, the system needs to be cleaned every 1-3 years.

Excessive oils, fuels or sediments may reduce the maintenance cycle. Periodic inspection is important.

Determining When to Clean

To determine the sediment depth, the maintenance contractor should lower a stadia rod into the manhole until it contacts the top of the captured sediment and mark that spot on the rod. Then push the probe through to the bottom of the sump and mark that spot to determine sediment depth.

Maintenance should occur when the sediment has reached the levels indicated in the Storage Capacity Chart.

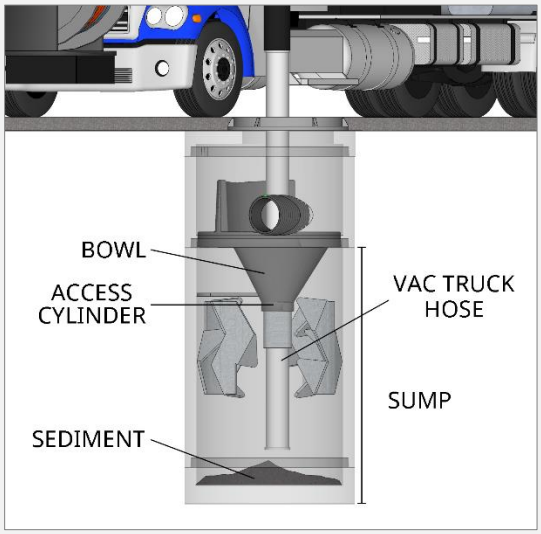
Barracuda Storage Capacities

Model	Manhole Diameter in. (mm)	Total System Volume Gallons (Liters)	Treatment Chamber Capacity Gallons (Liters)	Standard Sediment Capacity (20" depth) Yards^3 (meters^3)	NJDEP Sediment Capacity (50% of standard depth) Yards^3 (meters^3)
S3	36 (900)	264 (999)	212 (803)	0.44 (0.34)	0.22 (0.17)
S4	48 (1200)	665 (2517)	564 (2135)	0.78 (0.60)	0.39 (0.30)
S6	72 (1800)	1497 (5667)	1269 (4804)	1.75 (1.34)	0.88 (0.67)
S8	96 (2400)	4196 (15884)	3835 (14517)	3.10 (2.37)	1.55 (1.19)

Maintenance Instructions

1. Remove the manhole cover to provide access to the pollutant storage. Pollutants are stored in the sump, below the bowl assembly visible from the surface. Access this area through the 8" (200 mm), 10" (250 mm), 15" (375 mm) or 20" (500 mm) diameter access cylinder.
2. Use a vacuum truck or other similar equipment to remove all water, debris, oils and sediment. See figure 1.
3. Use a high pressure hose to clean the manhole of all the remaining sediment and debris. Then, use the vacuum truck to remove the water.
4. Fill the cleaned manhole with water until the level reaches the invert of the outlet pipe.
5. Replace the manhole cover.
6. Dispose of the polluted water, oils, sediment and trash at an approved facility.
    a. Local regulations prohibit the discharge of solid material into the sanitary system. Check with the local sewer authority for authority to discharge the liquid.
    b. Some localities treat the pollutants as leachate. Check with local regulators about disposal requirements.
    c. Additional local regulations may apply to the maintenance procedure.

Figure 1



APPENDIX E

Educational Materials

Non-Stormwater Discharges SC-10

Description

Non-stormwater discharges (NSWDs) are flows that do not consist entirely of stormwater. Some non-stormwater discharges do not include pollutants and may be discharged to the storm drain if local regulations allow. These include uncontaminated groundwater and natural springs. There are also some non-stormwater discharges that typically do not contain pollutants and may be discharged to the storm drain with conditions. These include: potable water sources, fire hydrant flushing, air conditioner condensate, landscape irrigation drainage and landscape watering, emergency firefighting, etc. as discussed in Section 2.

However there are certain non-stormwater discharges that pose an environmental concern. These discharges may originate from illegal dumping of industrial material or wastes and illegal connections such as internal floor drains, appliances, industrial processes, sinks, and toilets that are illegally connected to the nearby storm drainage system through on-site drainage and piping. These unauthorized discharges (examples of which may include: process waste waters, cooling waters, wash waters, and sanitary wastewater) can carry substances such as paint, oil, fuel and other automotive fluids, chemicals and other pollutants into storm drains.

Non-stormwater discharges will need to be addressed through a combination of detection and elimination. The ultimate goal is to effectively eliminate unauthorized non-stormwater discharges to the stormwater drainage system through implementation of measures to detect, correct, and enforce against illicit connections and illegal discharges of

Objectives
■ *Cover*
■ *Contain*
■ *Educate*
■ *Reduce/Minimize*
■ *Product Substitution*

Targeted Constituents	
Sediment	
Nutrients	✓
Trash	
Metals	✓
Bacteria	✓
Oil and Grease	✓
Organics	✓

Minimum BMPs Covered	
Good Housekeeping	✓
Preventative Maintenance	
Spill and Leak Prevention and Response	✓
Material Handling & Waste Management	
Erosion and Sediment Controls	
Employee Training Program	✓
Quality Assurance Record Keeping	✓

CASQA
CALIFORNIA STORMWATER QUALITY ASSOCIATION®

pollutants on streets and into the storm drain system and downstream water bodies.

Approach

Initially the Discharger must make an assessment of non-stormwater discharges to determine which types must be eliminated or addressed through BMPs. The focus of the following approach is the elimination of unauthorized non-stormwater discharges. See other BMP Fact Sheets for activity-specific pollution prevention procedures.

General Pollution Prevention Protocols

- Implement waste management controls described in SC-34 Waste Handling and Disposal.

- Develop clear protocols and lines of communication for effectively prohibiting non-stormwater discharges, especially those that are not classified as hazardous. These are often not responded to as effectively as they need to be.

- Stencil or demarcate storm drains, where applicable, to prevent illegal disposal of pollutants. Storm drain inlets should have messages such as "Dump No Waste Drains to Stream" or similar stenciled or demarcated next to them to warn against ignorant or unintentional dumping of pollutants into the storm drainage system.

- Manage and control sources of water such as hose bibs, faucets, wash racks, irrigation heads, etc. Identify hoses and faucets in the SWPPP, and post signage for appropriate use.

Non-Stormwater Discharge Investigation Protocols

Identifying the sources of non-stormwater discharges requires the Discharger to conduct an investigation of the facility at regular intervals. There are several categories of non-stormwater discharges:

- Visible, easily identifiable discharges, typically generated as surface runoff, such as uncontained surface runoff from vehicle or equipment washing; and

- Non-visible, (e.g., subsurface) discharges into the site drainage system through a variety of pathways that are not obvious.

The approach to detecting and eliminating non-stormwater discharges will vary considerably, as discussed below:

Visible and identifiable discharges

- Conduct routine inspections of the facilities and of each major activity area and identify visible evidence of unauthorized non-stormwater discharges. This may include:

  - ✓ Visual observations of actual discharges occurring;

- ✓ Evidence of surface staining, discoloring etc. that indicates that discharges have occurred;
- ✓ Pools of water in low lying areas when a rain event has not occurred; and
- ✓ Discussions with operations personnel to understand practices that may lead to unauthorized discharges.

- □ If evidence of non-stormwater discharges is discovered:
  - ✓ Document the location and circumstances using Worksheets 5 and 6 (Section 2 of the manual), including digital photos;
  - ✓ Identify and implement any quick remedy or corrective action (e.g., moving uncovered containers inside or to a proper location); and
  - ✓ Develop a plan to eliminate the discharge. Consult the appropriate activity-specific BMP Fact Sheet for alternative approaches to manage and eliminate the discharge.
- □ Consult the appropriate activity-specific BMP Fact Sheet for alternative approaches to manage and eliminate the discharge. Make sure the facility SWPPP is up-to-date and includes applicable BMPs to address the non-stormwater discharge.

Other Illegal Discharges (Non visible)

Illicit Connections

- □ Locate discharges from the industrial storm drainage system to the municipal storm drain system through review of "as-built" piping schematics.
- □ Isolate problem areas and plug illicit discharge points.
- □ Locate and evaluate discharges to the storm drain system.
- □ Visual Inspection and Inventory:
  - ✓ Inventory and inspect each discharge point during dry weather.
  - ✓ Keep in mind that drainage from a storm event can continue for a day or two following the end of a storm and groundwater may infiltrate the underground stormwater collection system.
  - ✓ Non-stormwater discharges are often intermittent and may require periodic inspections.

Review Infield Piping

- □ A review of the "as-built" piping schematic is a way to determine if there are any connections to the stormwater collection system.

- Inspect the path of loading/unloading area drain inlets and floor drains in older buildings.

- Never assume storm drains are connected to the sanitary sewer system.

Monitoring for investigation/detection of illegal discharges

- If a suspected illegal or unknown discharge is detected, monitoring of the discharge may help identify the content and/or suggest the source. This may be done with a field screening analysis, flow meter measurements, or by collecting a sample for laboratory analysis. Section 5 and Appendix D describe the necessary field equipment and procedures for field investigations.

- Investigative monitoring may be conducted over time. For example if, a discharge is intermittent, then monitoring might be conducted to determine the timing of the discharge to determine the source.

- Investigative monitoring may be conducted over a spatial area. For example, if a discharge is observed in a pipe, then monitoring might be conducted at accessible upstream locations in order to pinpoint the source of the discharge.

- Generally, investigative monitoring requiring collection of samples and submittal for lab analysis requires proper planning and specially trained staff.

Smoke Testing

Smoke testing of wastewater and stormwater collection systems is used to detect connections between the two piping systems. Smoke testing is generally performed at a downstream location and the smoke is forced upstream using blowers to create positive pressure. The advantage to smoke testing is that it can potentially identify multiple potential discharge sources at once.

- Smoke testing uses a harmless, non-toxic smoke cartridges developed specifically for this purpose.

- Smoke testing requires specialized equipment (e.g., cartridges, blowers) and is generally only appropriate for specially trained staff.

- A Standard Operating Procedure (SOP) for smoke testing is highly desirable. The SOP should address the following elements:

  - ✓ Proper planning and notification of nearby residents and emergency services is necessary since introducing smoke into the system may result in false alarms;

  - ✓ During dry weather, the stormwater collection system is filled with smoke and then traced back to sources;

- ✓ Temporary isolation of segments of pipe using sand bags is often needed to force the smoke into leaking pipes; and
- ✓ The appearance of smoke in a waste vent pipe, at a sewer manhole, or even the base of a toilet indicates that there may be a connection between the sanitary and storm water systems.

- Most municipal wastewater agencies will have necessary staff and equipment to conduct smoke testing and they should be contacted if cross connections with the sanitary sewer are suspected. See SC-44 Drainage System Maintenance for more information.

Dye Testing

- Dye testing is typically performed when there is a suspected specific pollutant source and location (i.e., leaking sanitary sewer) and there is evidence of dry weather flows in the stormwater collection system.
- Dye is released at a probable upstream source location, either the facility's sanitary or process wastewater system. The dye must be released with a sufficient volume of water to flush the system.
- Operators then visually examine the downstream discharge points from the stormwater collection system for the presence of the dye.
- Dye testing can be performed informally using commercially available products in order to conduct an initial investigation for fairly obvious cross-connections.
- More detailed dye testing should be performed by properly trained staff and follow SOPs. Specialized equipment such as fluorometers may be necessary to detect low concentrations of dye.
- Most municipal wastewater agencies will have necessary staff and equipment to conduct dye testing and they should be contacted if cross connections with the sanitary sewer are suspected.

TV Inspection of Drainage System

- Closed Circuit Television (CCTV) can be employed to visually identify illicit connections to the industrial storm drainage system. Two types of CCTV systems are available: (1) a small specially designed camera that can be manually pushed on a stiff cable through storm drains to observe the interior of the piping, or (2) a larger remote operated video camera on treads or wheels that can be guided through storm drains to view the interior of the pipe.
- CCTV systems often include a high-pressure water jet and camera on a flexible cable. The water jet cleans debris and biofilm off the inside of pipes so the camera can take video images of the pipe condition.

- CCTV units can detect large cracks and other defects such as offsets in pipe ends caused by root intrusions or shifting substrate.
- CCTV can also be used to detect dye introduced into the sanitary sewer.
- CCTV inspections require specialized equipment and properly trained staff and are generally best left to specialized contractors or municipal public works staff.

Illegal Dumping

- Substances illegally dumped on streets and into the storm drain systems and creeks may include paints, used oil and other automotive fluids, construction debris, chemicals, fresh concrete, leaves, grass clippings, and pet wastes. These wastes can cause stormwater and receiving water quality problems as well as clog the storm drain system itself.
- Establish a system for tracking incidents. The system should be designed to identify the following:
  - ✓ Illegal dumping hot spots;
  - ✓ Types and quantities (in some cases) of wastes;
  - ✓ Patterns in time of occurrence (time of day/night, month, or year);
  - ✓ Mode of dumping (abandoned containers, "midnight dumping" from moving vehicles, direct dumping of materials, accidents/spills);
  - ✓ An anonymous tip/reporting mechanism; and
  - ✓ Evidence of responsible parties (e.g., tagging, encampments, etc.).
- One of the keys to success of reducing or eliminating illegal dumping is increasing the number of people at the facility who are aware of the problem and who have the tools to at least identify the incident, if not correct it. Therefore, train field staff to recognize and report the incidents.

Once a site has been cleaned:

- Post "No Dumping" signs with a phone number for reporting dumping and disposal.
- Landscaping and beautification efforts of hot spots may also discourage future dumping, as well as provide open space and increase property values.
- Lighting or barriers may also be needed to discourage future dumping.
- See fact sheet SC-11 Spill Prevention, Control, and Cleanup.

Inspection

- Regularly inspect and clean up hot spots and other storm drainage areas where illegal dumping and disposal occurs.
- Conduct field investigations of the industrial storm drain system for potential sources of non-stormwater discharges.
- Pro-actively conduct investigations of high priority areas. Based on historical data, prioritize specific geographic areas and/or incident type for pro-active investigations.

Spill and Leak Prevention and Response

- On paved surfaces, clean up spills with as little water as possible. Use a rag for small spills, a damp mop for general cleanup, and absorbent material for larger spills. If the spilled material is hazardous, then the used cleanup materials are also hazardous and must be sent to a certified laundry (rags) or disposed of as hazardous waste.
- Never hose down or bury dry material spills. Sweep up the material and dispose of properly.
- Use adsorbent materials on small spills rather than hosing down the spill. Remove the adsorbent materials promptly and dispose of properly.
- For larger spills, a private spill cleanup company or Hazmat team may be necessary.
- See SC-11 Spill Prevention Control and Cleanup.

Employee Training Program

- Training of technical staff in identifying and documenting illegal dumping incidents is required. The frequency of training must be presented in the SWPPP, and depends on site-specific industrial materials and activities.
- Consider posting a quick reference table near storm drains to reinforce training.
- Train employees to identify non-stormwater discharges and report discharges to the appropriate departments.
- Educate employees about spill prevention and cleanup.
- Well-trained employees can reduce human errors that lead to accidental releases or spills. The employee should have the tools and knowledge to immediately begin cleaning up a spill should one occur. Employees should be familiar with the Spill Prevention Control and Countermeasure Plan. Employees should be able to identify work/jobs with high potential for spills and suggest methods to reduce possibility.
- Determine and implement appropriate outreach efforts to reduce non-permissible non-stormwater discharges.

- Conduct spill response drills annually (if no events occurred) in order to evaluate the effectiveness of the plan.
- When a responsible party is identified, educate the party on the impacts of his or her actions.

Quality Assurance and Record Keeping

Performance Evaluation

- Annually review internal investigation results; assess whether goals were met and what changes or improvements are necessary.
- Obtain feedback from personnel assigned to respond to, or inspect for, illicit connections and illegal dumping incidents.
- Develop document and data management procedures.
- A database is useful for defining and tracking the magnitude and location of the problem.
- Report prohibited non-stormwater discharges observed during the course of normal daily activities so they can be investigated, contained, and cleaned up or eliminated.
- Document that non-stormwater discharges have been eliminated by recording tests performed, methods used, dates of testing, and any on-site drainage points observed.
- Annually document and report the results of the program.
- Maintain documentation of illicit connection and illegal dumping incidents, including significant conditionally exempt discharges that are not properly managed.
- Document training activities.

Potential Limitations and Work-Arounds

Some facilities may have space constraints, limited staffing and time limitations that may preclude implementation of BMPs. Provided below are typical limitations and recommended "work-arounds."

- Many facilities do not have accurate, up-to-date 'as-built' plans or drawings which may be necessary in order to conduct non-stormwater discharge assessments.
  - ✓ Online tools such as Google Earth™ can provide an aerial view of the facility and may be useful in understanding drainage patterns and potential sources of non-stormwater discharges
  - ✓ Local municipal jurisdictions may have useful drainage systems maps.

- Video surveillance cameras are commonly used to secure the perimeter of industrial facilities against break-ins and theft. These surveillance systems may also be useful for capturing illegal dumping activities. Minor, temporary adjustments to the field of view of existing surveillance camera systems to target known or suspected problem areas may be a cost-effective way of capturing illegal dumping activities and identifying the perpetrators.

Potential Capital Facility Costs and Operation & Maintenance Requirements

Facilities

- Capital facility cost requirements may be minimal unless cross-connections to storm drains are detected.
- Indoor floor drains may require re-plumbing if cross-connections are detected.
- Leaky sanitary sewers will require repair or replacement which can have significant costs depending on the size and industrial activity at the facility.

Maintenance (including administrative and staffing)

- The primary effort is for staff time and depends on how aggressively a program is implemented.
- Costs for containment, and disposal of any leak or discharge is borne by the Discharger.
- Illicit connections can be difficult to locate especially if there is groundwater infiltration.
- Illegal dumping and illicit connection violations requires technical staff to detect and investigate them.

Supplemental Information

Permit Requirements

The IGP authorizes certain Non-Storm Water Discharges (NSWDs) provided BMPs are included in the SWPPP and implemented to:

- Reduce or prevent the contact of authorized NSWDs with materials or equipment that are potential sources of pollutants;
- Reduce, to the extent practicable, the flow or volume of authorized NSWDs;
- Ensure that authorized NSWDs do not contain quantities of pollutants that cause or contribute to an exceedance of a water quality standards (WQS); and,

- Reduce or prevent discharges of pollutants in authorized NSWDs in a manner that reflects best industry practice considering technological availability and economic practicability and achievability."

References and Resources

Center for Watershed Protection, 2004. *Illicit Discharge Detection and Elimination: A Guidance Manual for Program Development and Technical Assessments*, EPA Cooperative Agreement X-82907801-0.

Dublin San Ramon Sanitation District. http://www.dsrsd.com/wwrw/smoketest.html.

Orange County Stormwater Program, Best Management Practices for Industrial/Commercial Business Activities. Available online at: http://ocwatersheds.com/documents/bmp/industrialcommercialbusinessesactivities.

Sacramento Stormwater Management Program, *Best Management Practices for Industrial Storm Water Pollution Control*, Available online at: http://www.msa.saccounty.net/sactostormwater/documents/guides/industrial-BMP-manual.pdf.

Santa Clara Valley Urban Runoff Pollution Prevention Program. http://www.scvurppp.org.

Southern California Coastal Water Research Project, 2013. *The California Microbial Source Identification Manual: A Tiered Approach to Identifying Fecal Pollution Sources to Beaches,* Technical Report 804.

The Storm Water Managers Resource Center, http://www.stormwatercenter.net/.

US EPA. National Pollutant Discharge Elimination System. Available online at: http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=factsheet_results&view=specific&bmp=111.

WEF Press Alexandria, Virginia, 2009.Existing Sewer Evaluation and Rehabilitation: *WEF Manual of Practice No. FD-6 ASCE/EWRI Manuals and Reports on Engineering Practice No. 62, Third Edition.*

Spill Prevention, Control & Cleanup SC-11

Description

Many activities that occur at an industrial or commercial site have the potential to cause accidental spills. Preparation for accidental spills, with proper training and reporting systems implemented, can minimize the discharge of pollutants to the environment.

Spills and leaks are one of the largest contributors of stormwater pollutants. Spill prevention and control plans are applicable to any site at which hazardous materials are stored or used. An effective plan should have spill prevention and response procedures that identify hazardous material storage areas, specify material handling procedures, describe spill response procedures, and provide locations of spill clean-up equipment and materials. The plan should take steps to identify and characterize potential spills, eliminate and reduce spill potential, respond to spills when they occur in an effort to prevent pollutants from entering the stormwater drainage system, and train personnel to prevent and control future spills. An adequate supply of spill clean-up materials must be maintained onsite.

Objectives
■ *Cover*
■ *Contain*
■ *Educate*
■ *Reduce/Minimize*
■ *Product Substitution*

Targeted Constituents	
Sediment	
Nutrients	
Trash	
Metals	✓
Bacteria	
Oil and Grease	✓
Organics	✓

Minimum BMPs Covered	
Good Housekeeping	
Preventative Maintenance	
Spill and Leak Prevention and Response	✓
Material Handling & Waste Management	
Erosion and Sediment Controls	
Employee Training Program	✓
Quality Assurance Record Keeping	✓

Approach

General Pollution Prevention Protocols

- ☐ Develop procedures to prevent/mitigate spills to storm drain systems.
- ☐ Develop and standardize reporting procedures, containment, storage, and disposal activities, documentation, and follow-up procedures.
- ☐ Establish procedures and/or controls to minimize spills and leaks. The procedures should address:
  - ✓ Description of the facility, owner and address, activities, chemicals, and quantities present;

CASQA
CALIFORNIA STORMWATER QUALITY ASSOCIATION®

- ✓ Facility map of the locations of industrial materials;
- ✓ Notification and evacuation procedures;
- ✓ Cleanup instructions;
- ✓ Identification of responsible departments; and
- ✓ Identify key spill response personnel.

- ☐ Recycle, reclaim, or reuse materials whenever possible. This will reduce the amount of process materials that are brought into the facility.

Spill and Leak Prevention and Response

Spill Prevention

- ☐ Develop procedures to prevent/mitigate spills to storm drain systems. Develop and standardize reporting procedures, containment, storage, and disposal activities, documentation, and follow-up procedures.

- ☐ If illegal dumping is observed at the facility:

  - ✓ Post "No Dumping" signs with a phone number for reporting illegal dumping and disposal. Signs should also indicate fines and penalties applicable for illegal dumping.
  - ✓ Landscaping and beautification efforts may also discourage illegal dumping.
  - ✓ Bright lighting and/or entrance barriers may also be needed to discourage illegal dumping.

- ☐ Store and contain liquid materials in such a manner that if the container is ruptured, the contents will not discharge, flow, or be washed into the storm drainage system, surface waters, or groundwater.

- ☐ If the liquid is oil, gas, or other material that separates from and floats on water, install a spill control device (such as a tee section) in the catch basins that collects runoff from the storage tank area.

Preventative Maintenance

- ☐ Place drip pans or absorbent materials beneath all mounted taps, and at all potential drip and spill locations during filling and unloading of tanks. Any collected liquids or soiled absorbent materials must be reused/recycled or properly disposed.

- ☐ Store and maintain appropriate spill cleanup materials in a location known to all near the tank storage area; and ensure that employees are familiar with the site's spill control plan and/or proper spill cleanup procedures.

- ☐ Sweep and clean the storage area monthly if it is paved, *do not hose down the area to a storm drain.*

- ☐ Check tanks (and any containment sumps) daily for leaks and spills. Replace tanks that are leaking, corroded, or otherwise deteriorating with tanks in good condition. Collect all spilled liquids and properly dispose of them.

- ☐ Label all containers according to their contents (e.g., solvent, gasoline).

- ☐ Label hazardous substances regarding the potential hazard (corrosive, radioactive, flammable, explosive, poisonous).

- ☐ Prominently display required labels on transported hazardous and toxic materials (per US DOT regulations).

- ☐ Identify key spill response personnel.

Spill Response

- ☐ Clean up leaks and spills immediately.

- ☐ Place a stockpile of spill cleanup materials where it will be readily accessible (e.g., near storage and maintenance areas).

- ☐ On paved surfaces, clean up spills with as little water as possible.

  - ✓ Use a rag for small spills, a damp mop for general cleanup, and absorbent material for larger spills.

  - ✓ If the spilled material is hazardous, then the used cleanup materials are also hazardous and must be sent to a certified laundry (rags) or disposed of as hazardous waste.

  - ✓ If possible use physical methods for the cleanup of dry chemicals (e.g., brooms, shovels, sweepers, or vacuums).

- ☐ Never hose down or bury dry material spills. Sweep up the material and dispose of properly.

- ☐ Chemical cleanups of material can be achieved with the use of adsorbents, gels, and foams. Use adsorbent materials on small spills rather than hosing down the spill. Remove the adsorbent materials promptly and dispose of properly.

- ☐ For larger spills, a private spill cleanup company or Hazmat team may be necessary.

Reporting

- Report spills that pose an immediate threat to human health or the environment to the Regional Water Quality Control Board or local authority as location regulations dictate.
- Federal regulations require that any oil spill into a water body or onto an adjoining shoreline be reported to the National Response Center (NRC) at 800-424-8802 (24 hour).
- Report spills to 911 for dispatch and clean-up assistance when needed. Do not contact fire agencies directly.
- Establish a system for tracking incidents. The system should be designed to identify the following:
  - ✓ Types and quantities (in some cases) of wastes;
  - ✓ Patterns in time of occurrence (time of day/night, month, or year);
  - ✓ Mode of dumping (abandoned containers, "midnight dumping" from moving vehicles, direct dumping of materials, accidents/spills);
  - ✓ Clean-up procedures; and
  - ✓ Responsible parties.

Employee Training Program

- Educate employees about spill prevention and cleanup.
- Well-trained employees can reduce human errors that lead to accidental releases or spills:
  - ✓ The employee should have the tools and knowledge to immediately begin cleaning up a spill should one occur; and
  - ✓ Employees should be familiar with the Spill Prevention Control and Countermeasure Plan.
- Employees should be educated about aboveground storage tank requirements. Employees responsible for aboveground storage tanks and liquid transfers should be thoroughly familiar with the Spill Prevention Control and Countermeasure Plan and the plan should be readily available.
- Train employees to recognize and report illegal dumping incidents.

Other Considerations (Limitations and Regulations)

- State regulations exist for facilities with a storage capacity of 10,000 gallons or more of petroleum to prepare a Spill Prevention Control and Countermeasure (SPCC) Plan (Health & Safety Code Chapter 6.67).
- State regulations also exist for storage of hazardous materials (Health & Safety Code Chapter 6.95), including the preparation of area and business plans for emergency response to the releases or threatened releases.
- Consider requiring smaller secondary containment areas (less than 200 sq. ft.) to be connected to the sanitary sewer, prohibiting any hard connections to the storm drain.

Requirements

Costs (including capital and operation & maintenance)

- Will vary depending on the size of the facility and the necessary controls.
- Prevention of leaks and spills is inexpensive. Treatment and/or disposal of contaminated soil or water can be quite expensive.

Maintenance (including administrative and staffing)

- Develop spill prevention and control plan, provide and document training, conduct inspections of material storage areas, and supply spill kits.
- Extra time is needed to properly handle and dispose of spills, which results in increased labor costs.

Supplemental Information

Further Detail of the BMP

Reporting

Record keeping and internal reporting represent good operating practices because they can increase the efficiency of the facility and the effectiveness of BMPs. A good record keeping system helps the facility minimize incident recurrence, correctly respond with appropriate cleanup activities, and comply with legal requirements. A record keeping and reporting system should be set up for documenting spills, leaks, and other discharges, including discharges of hazardous substances in reportable quantities. Incident records describe the quality and quantity of non-stormwater discharges to the storm sewer. These records should contain the following information:

- Date and time of the incident;
- Weather conditions;
- Duration of the spill/leak/discharge;

- Cause of the spill/leak/discharge;
- Response procedures implemented;
- Persons notified; and
- Environmental problems associated with the spill/leak/discharge.

Separate record keeping systems should be established to document housekeeping and preventive maintenance inspections, and training activities. All housekeeping and preventive maintenance inspections should be documented. Inspection documentation should contain the following information:

- Date and time the inspection was performed;
- Name of the inspector;
- Items inspected;
- Problems noted;
- Corrective action required; and
- Date corrective action was taken.

Other means to document and record inspection results are field notes, timed and dated photographs, videotapes, and drawings and maps.

Aboveground Tank Leak and Spill Control

Accidental releases of materials from aboveground liquid storage tanks present the potential for contaminating stormwater with many different pollutants. Materials spilled, leaked, or lost from tanks may accumulate in soils or on impervious surfaces and be carried away by stormwater runoff.

The most common causes of unintentional releases are:

- Installation problems;
- Failure of piping systems (pipes, pumps, flanges, couplings, hoses, and valves);
- External corrosion and structural failure;
- Spills and overfills due to operator error; and
- Leaks during pumping of liquids or gases from truck or rail car to a storage tank or vice versa.

Storage of reactive, ignitable, or flammable liquids should comply with the Uniform Fire Code and the National Electric Code. Practices listed below should be employed to enhance the code requirements:

- Tanks should be placed in a designated area.
- Tanks located in areas where firearms are discharged should be encapsulated in concrete or the equivalent.
- Designated areas should be impervious and paved with Portland cement concrete, free of cracks and gaps, in order to contain leaks and spills.
- Liquid materials should be stored in UL approved double walled tanks or surrounded by a curb or dike to provide the volume to contain 10 percent of the volume of all of the containers or 110 percent of the volume of the largest container, whichever is greater. The area inside the curb should slope to a drain.
- For used oil or dangerous waste, a dead-end sump should be installed in the drain.
- All other liquids should be drained to the sanitary sewer if available. The drain must have a positive control such as a lock, valve, or plug to prevent release of contaminated liquids.
- Accumulated stormwater in petroleum storage areas should be passed through an oil/water separator.

Maintenance is critical to preventing leaks and spills. Conduct routine inspections and:

- Check for external corrosion and structural failure.
- Check for spills and overfills due to operator error.
- Check for failure of piping system (pipes, pumps, flanges, coupling, hoses, and valves).
- Check for leaks or spills during pumping of liquids or gases from truck or rail car to a storage facility or vice versa.
- Visually inspect new tank or container installation for loose fittings, poor welding, and improper or poorly fitted gaskets.
- Inspect tank foundations, connections, coatings, and tank walls and piping system. Look for corrosion, leaks, cracks, scratches, and other physical damage that may weaken the tank or container system.
- Frequently relocate accumulated stormwater during the wet season.

- Periodically conduct integrity testing by a qualified professional.

Vehicle Leak and Spill Control

Major spills on roadways and other public areas are generally handled by highly trained Hazmat teams from local fire departments or environmental health departments. The measures listed below pertain to leaks and smaller spills at vehicle maintenance shops.

In addition to implementing the spill prevention, control, and clean up practices above, use the following measures related to specific activities:

Vehicle and Equipment Maintenance

- Perform all vehicle fluid removal or changing inside or under cover to prevent the run-on of stormwater and the runoff of spills.
- Regularly inspect vehicles and equipment for leaks, and repair immediately.
- Check incoming vehicles and equipment (including delivery trucks, and employee and subcontractor vehicles) for leaking oil and fluids. Do not allow leaking vehicles or equipment onsite.
- Always use secondary containment, such as a drain pan or drop cloth, to catch spills or leaks when removing or changing fluids.
- Immediately drain all fluids from wrecked vehicles.
- Store wrecked vehicles or damaged equipment under cover.
- Place drip pans or absorbent materials under heavy equipment when not in use.
- Use absorbent materials on small spills rather than hosing down the spill.
- Remove the adsorbent materials promptly and dispose of properly.
- Promptly transfer used fluids to the proper waste or recycling drums. Don't leave full drip pans or other open containers lying around.
- Oil filters disposed of in trashcans or dumpsters can leak oil and contaminate stormwater. Place the oil filter in a funnel over a waste oil recycling drum to drain excess oil before disposal. Oil filters can also be recycled. Ask your oil supplier or recycler about recycling oil filters.
- Store cracked batteries in a non-leaking secondary container. Do this with all cracked batteries, even if you think all the acid has drained out. If you drop a battery, treat it as if it is cracked. Put it into the containment area until you are sure it is not leaking.

Vehicle and Equipment Fueling

- Design the fueling area to prevent the run-on of stormwater and the runoff of spills:

  Cover fueling area if possible.

  Use a perimeter drain or slope pavement inward with drainage to a sump.

  Pave fueling area with concrete rather than asphalt.

- If dead-end sump is not used to collect spills, install an oil/water separator.
- Install vapor recovery nozzles to help control drips as well as air pollution.
- Discourage "topping-off" of fuel tanks.
- Use secondary containment when transferring fuel from the tank truck to the fuel tank.
- Use absorbent materials on small spills and general cleaning rather than hosing down the area. Remove the absorbent materials promptly.
- Carry out all Federal and State requirements regarding underground storage tanks, or install above ground tanks.
- Do not use mobile fueling of mobile industrial equipment around the facility; rather, transport the equipment to designated fueling areas.
- Keep your Spill Prevention Control and Countermeasure (SPCC) Plan up-to-date.
- Train employees in proper fueling and cleanup procedures.

Industrial Spill Prevention Response

For the purposes of developing a spill prevention and response program to meet the stormwater regulations, facility managers should use information provided in this fact sheet and the spill prevention/response portions of the fact sheets in this handbook, for specific activities.

The program should:

- Integrate with existing emergency response/hazardous materials programs (e.g., Fire Department).
- Develop procedures to prevent/mitigate spills to storm drain systems.
- Identify responsible departments.

- Develop and standardize reporting procedures, containment, storage, and disposal activities, documentation, and follow-up procedures.
- Address spills at municipal facilities, as well as public areas.
- Provide training concerning spill prevention, response and cleanup to all appropriate personnel.

References and Resources

California's Nonpoint Source Program Plan. http://www.swrcb.ca.gov/nps/index.html.

Clark County Storm Water Pollution Control Manual. Available online at: http://www.co.clark.wa.us/pubworks/bmpman.pdf.

King County Storm Water Pollution Control Manual. Available online at: http://dnr.metrokc.gov/wlr/dss/spcm.htm.

Orange County Stormwater Program, Best Management Practices for Industrial/Commercial Business Activities. Available online at: http://ocwatersheds.com/documents/bmp/industrialcommercialbusinessesactivities

Santa Clara Valley Urban Runoff Pollution Prevention Program. http://www.scvurppp.org.

The Stormwater Managers Resource Center. http://www.stormwatercenter.net/.

Outdoor Loading/Unloading SC-30

Description

The loading/unloading of materials usually takes place outside on docks or terminals; therefore, materials spilled, leaked, or lost during loading/unloading may collect in the soil or on other surfaces and have the potential to be carried away by wind, stormwater runoff or when the area is cleaned. Additionally, rainfall may wash pollutants from machinery used to unload or move materials. Implementation of the following protocols will prevent or reduce the discharge of pollutants to stormwater from outdoor loading/unloading of materials.

Approach

Reduce potential for pollutant discharge through source control pollution prevention and BMP implementation. Successful implementation depends on effective training of employees on applicable BMPs and general pollution prevention strategies and objectives.

General Pollution Prevention Protocols

- Park tank trucks or delivery vehicles in designated areas so that spills or leaks can be contained.
- Limit exposure of material to rainfall whenever possible.
- Prevent stormwater run-on.
- Check equipment regularly for leaks.

Good Housekeeping

- Develop an operations plan that describes procedures for loading and/or unloading.
- Conduct loading and unloading in dry weather if possible.

Objectives
■ *Cover*
■ *Contain*
■ *Educate*
■ *Reduce/Minimize*
■ *Product Substitution*

Targeted Constituents	
Sediment	✓
Nutrients	✓
Trash	
Metals	✓
Bacteria	
Oil and Grease	✓
Organics	✓

Minimum BMPs Covered	
Good Housekeeping	✓
Preventative Maintenance	
Spill and Leak Prevention and Response	✓
Material Handling & Waste Management	✓
Erosion and Sediment Controls	
Employee Training Program	✓
Quality Assurance Record Keeping	✓

CASQA
CALIFORNIA STORMWATER QUALITY ASSOCIATION®

- Cover designated loading/unloading areas to reduce exposure of materials to rain.
- Consider placing a seal or door skirt between delivery vehicles and building to prevent exposure to rain.
- Design loading/unloading area to prevent stormwater run-on, which would include grading or berming the area, and position roof downspouts so they direct stormwater away from the loading/unloading areas.
- Have employees load and unload all materials and equipment in covered areas such as building overhangs at loading docks if feasible.
- Load/unload only at designated loading areas.
- Use drip pans underneath hose and pipe connections and other leak-prone spots during liquid transfer operations, and when making and breaking connections. Several drip pans should be stored in a covered location near the liquid transfer area so that they are always available, yet protected from precipitation when not in use. Drip pans can be made specifically for railroad tracks. Drip pans must be cleaned periodically, and drip collected materials must be disposed of properly.
- Pave loading areas with concrete instead of asphalt.
- Avoid placing storm drains inlets in the area.
- Grade and/or berm the loading/unloading area with drainage to sump; regularly remove materials accumulated in sump.

Spill Response and Prevention Procedures

- Keep your spill prevention and control plan up-to-date or have an emergency spill cleanup plan readily available, as applicable.
- Contain leaks during transfer.
- Store and maintain appropriate spill cleanup materials in a location that is readily accessible and known to all employees.
- Ensure that employees are familiar with the site's spill control plan and proper spill cleanup procedures.
- Use drip pans or comparable devices when transferring oils, solvents, and paints.

Material Handling and Waste Management

- Spot clean leaks and drips routinely to prevent runoff of spillage.
- Do not pour liquid wastes into floor drains, sinks, outdoor storm drain inlets, or other storm drains or sewer connections.

- Do not put used or leftover cleaning solutions, solvents, and automotive fluids in the storm drain or sanitary sewer.
- Collect leaking or dripping fluids in drip pans or containers. Fluids are easier to recycle if kept separate.
- Promptly transfer used fluids to the proper waste or recycling drums. Do not leave drip pans or other open containers lying around.
- Minimize the possibility of stormwater pollution from outside waste receptacles by doing at least one of the following:
  - ✓ Use only watertight waste receptacle(s) and keep the lid(s) closed.
  - ✓ Grade and pave the waste receptacle area to prevent run-on of stormwater.
  - ✓ Install a roof over the waste receptacle area.
  - ✓ Install a low containment berm around the waste receptacle area.
  - ✓ Use and maintain drip pans under waste receptacles.
- Post "no littering" signs.
- Perform work area clean-up and dry sweep after daily operations.

Employee Training Program

- Train employees (e.g., fork lift operators) and contractors on proper spill containment and cleanup.
- Have employees trained in spill containment and cleanup present during loading/unloading.
- Train employees in proper handling techniques during liquid transfers to avoid spills.
- Make sure forklift operators are properly trained on loading and unloading procedures.

Quality Assurance and Record Keeping

- Keep accurate maintenance logs that document activities performed, quantities of materials removed, and improvement actions.
- Keep accurate logs of spill response actions that document what was spilled, how it was cleaned up, and how the waste was disposed.
- Establish procedures to complete logs and file them in the central office.
- Keep accurate logs of daily clean-up operations.

Potential Limitations and Work-Arounds

Some facilities may have space constraints, limited staffing and time limitations that may preclude implementation of BMPs. Provided below are typical limitations and recommended "work-arounds."

- Space and time limitations may preclude all transfers from being performed indoors or under cover.
  - ✓ Designate specific areas for outdoor loading and unloading.
  - ✓ Require employees to understand and follow spill and leak prevention BMPs.
- It may not be possible to conduct transfers only during dry weather.
  - ✓ Limit materials and equipment rainfall exposure to all extents practicable.
  - ✓ Require employees to understand and follow spill and leak prevention BMPs.

Potential Capital Facility Costs and Operation & Maintenance Requirements

Facilities

Many facilities will already have indoor or covered areas where loading/unloading takes place and will require no additional capital expenditures.

If outdoor activities are required, construction of berms or other means to retain spills and leaks may require appropriate constructed systems for containment. These containment areas may require significant new capital investment.

Capital investments will likely be required at some sites if adequate cover and containment facilities do not exist and can vary significantly depending upon site conditions.

Maintenance

Most of the operations and maintenance activities associated with implementing this BMP are integrally linked to routine operations as previously described. Therefore additional O&M is not required.

- Conduct regular inspections and make repairs and improvements as necessary.
- Check loading and unloading equipment regularly for leaks.
- Conduct regular broom dry-sweeping of area. Do not wash with water.

Supplemental Information

Loading and Unloading of Liquids

- Loading or unloading of liquids should occur in the manufacturing building so that any spills that are not completely retained can be discharged to the sanitary sewer,

treatment plant, or treated in a manner consistent with local sewer authorities and permit requirements.

- For loading and unloading tank trucks to above and below ground storage tanks, the following procedures should be used:
  - ✓ The area where the transfer takes place should be paved. If the liquid is reactive with the asphalt, Portland cement should be used to pave the area.
  - ✓ The transfer area should be designed to prevent run-on of stormwater from adjacent areas. Sloping the pad and using a curb, like a speed bump, around the uphill side of the transfer area should reduce run-on.
  - ✓ The transfer area should be designed to prevent runoff of spilled liquids from the area. Sloping the area to a drain should prevent runoff. The drain should be connected to a dead-end sump or to the sanitary sewer. A positive control valve should be installed on the drain.
- For transfer from rail cars to storage tanks that must occur outside, use the following procedures:
  - ✓ Drip pans should be placed at locations where spillage may occur, such as hose connections, hose reels, and filler nozzles. Use drip pans when making and breaking connections.
  - ✓ Drip pan systems should be installed between the rails to collect spillage from tank cars.

References and Resources

Minnesota Pollution Control Agency, *Industrial Stormwater Best Management Practices Guidebook BMP 26 Fueling and Liquid Loading/Unloading Operations*. Available online at: http://www.pca.state.mn.us/index.php/view-document.html?gid=10557.

New Jersey Department of Environmental Protection, 2013. *Basic Industrial Stormwater General Permit Guidance Document NJPDES General Permit No NJ0088315*. Available online at: http://www.nj.gov/dep/dwq/pdf/5G2_guidance_color.pdf.

Orange County Stormwater Program, Best Management Practices for Industrial/Commercial Business Activities. Available online at: http://ocwatersheds.com/documents/bmp/industrialcommercialbusinessesactivities.

Oregon Department of Environmental Quality, 2013. *Industrial Stormwater Best Management Practices Manual- BMP 26 Fueling and Liquid Loading/Unloading Operations*. Available online at: http://www.deq.state.or.us/wq/wqpermit/docs/IndBMP021413.pdf.

Sacramento Stormwater Management Program, *Best Management Practices for Industrial Storm Water Pollution Control*. Available online at: http://www.msa.saccounty.net/sactostormwater/documents/guides/industrial-BMP-manual.pdf.

Sacramento County Environmental Management Stormwater Program: *Best Management Practices*. Available online at: http://www.emd.saccounty.net/EnvHealth/Stormwater/Stormwater-BMPs.html.

Santa Clara Valley Urban Runoff Pollution Prevention Program. http://www.scvurppp-w2k.com/.

US EPA. National Pollutant Discharge Elimination System – Industrial Fact Sheet Series for Activities Covered by EPA's Multi Sector General Permit. Available online at: http://cfpub.epa.gov/npdes/stormwater/swsectors.cfm.

Outdoor Equipment Operations SC-32

Description

Outside process equipment operations and maintenance can contaminate stormwater runoff. Activities, such as grinding, painting, coating, sanding, degreasing or parts cleaning, landfills and waste piles, and solid waste treatment and disposal are examples of process operations that can lead to contamination of stormwater runoff. The targeted constituents will vary for each site depending on the operation being performed.

Approach

Implement source control BMPs to limit exposure of outdoor equipment to direct precipitation and stormwater run-on. Refer to SC-22 Vehicle and Equipment Repair for additional information.

General Pollution Prevention Protocols

- ☐ Perform the activity during dry periods whenever possible.
- ☐ Install secondary containment measures where leaks and spills may occur.
- ☐ Use non-toxic chemicals for maintenance and minimize or eliminate the use of solvents.
- ☐ Connect process equipment area to public sanitary sewer or facility wastewater treatment system when possible. Some jurisdictions require that secondary containment areas be connected to the sanitary sewer, prohibiting any hard connections to the storm drain.

Good Housekeeping

- ☐ Manage materials and waste properly (see Material Handling and Waste Management) to reduce adverse impacts on stormwater quality.

Objectives
■ Cover
■ *Contain*
■ *Educate*
■ *Reduce/Minimize*

Targeted Constituents	
Sediment	✓
Nutrients	✓
Trash	✓
Metals	✓
Bacteria	✓
Oil and Grease	✓
Organics	✓

Minimum BMPs Covered	
Good Housekeeping	✓
Preventative Maintenance	✓
Spill and Leak Prevention and Response	✓
Material Handling & Waste Management	✓
Erosion and Sediment Controls	
Employee Training Program	✓
Quality Assurance Record Keeping	✓

CASQA
CALIFORNIA STORMWATER QUALITY ASSOCIATION®

- Cover the work area with a permanent roof if possible.
- Use drop cloths for sanding and painting operations.
- Use a vacuum for fine particle clean-up in pavement cracks and crevices.
- Minimize contact of stormwater with outside process equipment operations through berming and drainage routing (run-on prevention).
- "Spot clean" leaks and drips routinely. Leaks are not cleaned up until the absorbent is picked up and disposed of properly.
- Paint signs on storm drain inlets to indicate that they are not to receive liquid or solid wastes.
- Use roll down or permanent walls when windy/breezy to prevent wind transport of particulates/pollutants.

Preventative Maintenance

- Design outdoor equipment areas to prevent stormwater runoff and spills. Use a perimeter drain or slope pavement inward with drainage to sump.
- Dry clean the work area regularly. Do not wash outdoor equipment with water if there is a direct connection to the storm drain.
- Pave area with concrete rather than asphalt.
- Inspect outdoor equipment regularly for leaks or spills. Also check for structural failure, spills and overfills due to operator error, and/or failure of piping system.
- Inspect and clean, if necessary, storm drain inlets and catch basins within the outdoor equipment area before October 1 each year.

Spill Response and Prevention Procedures

- Keep your Spill Prevention Control and Countermeasure (SPCC) Plan up-to-date.
- Have employees trained in emergency spill cleanup procedures present when dangerous waste, liquid chemicals, or other wastes are delivered.
- Place a stockpile of spill cleanup materials where it will be readily accessible.
- Prevent operator errors by using engineering safe guards and thus reducing accidental releases of pollutant.

Material Handling and Waste Management

- Do not pour liquid wastes into floor drains, sinks, outdoor storm drain inlets, or other storm drain or sewer connections.
- Collect leaking or dripping fluids in drip pans or containers. Fluids are easier to recycle if kept separate.
- Promptly transfer used fluids to the proper waste or recycling drums. Do not leave drip pans or other open containers lying around.
- Minimize the possibility of stormwater pollution from outside waste receptacles by doing at least one of the following:
  - ✓ Use only watertight waste receptacle(s) and keep the lid(s) closed.
  - ✓ Grade and pave the waste receptacle area to prevent run-on of stormwater.
  - ✓ Install a roof over the waste receptacle area.

Employee Training Program

- Educate employees about pollution prevention measures and goals.
- Train employees on proper equipment operation and maintenance procedures.
- Train all employees upon hiring and annually thereafter on proper methods for handling and disposing of waste. Ensure that all employees understand stormwater discharge prohibitions, wastewater discharge requirements, and these best management practices.
- Use a training log or similar method to document training.
- Ensure that employees are familiar with the site's spill control plan and/or proper spill cleanup procedures.

Quality Assurance and Record Keeping

- Keep accurate maintenance logs that document minimum BMP activities performed for outdoor equipment, types and quantities of materials removed and disposed of, and any improvement actions.
- Keep accurate logs of spill response actions that document what was spilled, how it was cleaned up, and how the waste was disposed.
- Establish procedures to complete logs and file them in the central office.

Potential Limitations and Work-Arounds

Some facilities may have space constraints, limited staffing and time limitations that may preclude implementation of BMPs. Provided below are typical limitations and recommended "work-arounds."

- Providing cover over outdoor equipment may be impractical or cost-prohibitive.
  - ✓ Operate outdoor equipment only during periods of dry weather.
- Regular operations and time limitations may require outdoor activities during wet weather.
  - ✓ Designate specific areas for outdoor activities.
  - ✓ Allow time for work area clean-up after each shift.
  - ✓ Require employees to understand and follow preventive maintenance and spill and leak prevention BMPs.
  - ✓ Design and install secondary containment and good housekeeping BMPs for outdoor equipment area.
- Storage sheds often must meet building and fire code requirements.

Potential Capital Facility Costs and Operation & Maintenance Requirements

Facilities

- Many facilities will already have indoor covered areas where vehicle and equipment repairs take place and will require no additional capital expenditures.
- If outdoor activities are required, construction of berms or other means to retain spills and leaks may require appropriate constructed systems for containment. These containment areas may require significant new capital investment.
- Capital investments will likely be required at some sites if adequate cover and containment facilities do not exist and can vary significantly depending upon site conditions.

Maintenance

- Most of the operations and maintenance activities associated with implementing this BMP are integrally linked to routine operations as previously described. Therefore additional O&M is not required.
- For facilities responsible for pre-treating their wastewater prior to discharging, the proper functioning of structural treatment system is an important maintenance consideration.
- Routine cleanout of oil and grease is required for the devices to maintain their effectiveness, usually at least once a month. During periods of heavy rainfall, cleanout is required more often to ensure pollutants are not washed through the trap. Sediment removal is also required on a regular basis to keep the device working efficiently.

References and Resources

Minnesota Pollution Control Agency. *Industrial Stormwater Best Management Practices Guidebook BMP 26 Fueling and Liquid Loading/Unloading Operations*. Available online at: http://www.pca.state.mn.us/index.php/view-document.html?gid=10557.

New Jersey Department of Environmental Protection, 2013. *Basic Industrial Stormwater General Permit Guidance Document NJPDES General Permit No NJ0088315*. Available online at: http://www.nj.gov/dep/dwq/pdf/5G2_guidance_color.pdf.

Orange County Stormwater Program, Best Management Practices for Industrial/Commercial Business Activities. Available online at: http://ocwatersheds.com/documents/bmp/industrialcommercialbusinessesactivities.

Oregon Department of Environmental Quality, *Industrial Stormwater Best Management Practices Manual- BMP 26 Fueling and Liquid Loading/Unloading Operations*, February 2013. Available online at: http://www.deq.state.or.us/wq/wqpermit/docs/IndBMP021413.pdf.

Sacramento Stormwater Management Program. *Best Management Practices for Industrial Storm Water Pollution Control*. Available online at: http://www.msa.saccounty.net/sactostormwater/documents/guides/industrial-BMP-manual.pdf.

Sacramento County Environmental Management Stormwater Program: Best Management Practices. Available online at: http://www.emd.saccounty.net/EnvHealth/Stormwater/Stormwater-BMPs.html.

Santa Clara Valley Urban Runoff Pollution Prevention Program. http://www.scvurppp-w2k.com/

US EPA. National Pollutant Discharge Elimination System – Industrial Fact Sheet Series for Activities Covered by EPA's Multi Sector General Permit. Available online at: http://cfpub.epa.gov/npdes/stormwater/swsectors.cfm.

Waste Handling & Disposal SC-34

Description

Improper storage and handling of solid wastes can allow toxic compounds, oils and greases, heavy metals, nutrients, suspended solids, and other pollutants to enter stormwater runoff. The discharge of pollutants to stormwater from waste handling and disposal can be prevented and reduced by tracking waste generation, storage, and disposal; reducing waste generation and disposal through source reduction, reuse, and recycling; and preventing run-on and runoff.

Approach

Reduce potential for pollutant discharge through source control pollution prevention and BMP implementation. Successful implementation depends on effective training of employees on applicable BMPs and general pollution prevention strategies and objectives.

General Pollution Prevention Protocols

- ☐ Accomplish reduction in the amount of waste generated using the following source controls:
  - ✓ Production planning and sequencing;
  - ✓ Process or equipment modification;
  - ✓ Raw material substitution or elimination;
  - ✓ Loss prevention and housekeeping;
  - ✓ Waste segregation and separation; and
  - ✓ Close loop recycling.
- ☐ Establish a material tracking system to increase awareness about material usage. This may reduce spills and minimize contamination, thus reducing the amount of waste produced.
- ☐ Recycle materials whenever possible.

Objectives
■ *Cover*
■ *Contain*
■ *Educate*
■ *Reduce/Minimize*
■ *Product Substitution*

Targeted Constituents	
Sediment	
Nutrients	
Trash	
Metals	✓
Bacteria	✓
Oil and Grease	✓
Organics	✓

Minimum BMPs Covered	
Good Housekeeping	✓
Preventative Maintenance	✓
Spill and Leak Prevention and Response	✓
Material Handling & Waste Management	✓
Erosion and Sediment Controls	
Employee Training Program	✓
Quality Assurance Record Keeping	✓

CASQA
CALIFORNIA STORMWATER QUALITY ASSOCIATION®

- Use the entire product before disposing of the container.
- To the extent possible, store wastes under cover or indoors after ensuring all safety concerns such as fire hazard and ventilation are addressed.
- Provide containers for each waste stream at each work station. Allow time after shift to clean area.

Good Housekeeping

- Cover storage containers with leak proof lids or some other means. If waste is not in containers, cover all waste piles (plastic tarps are acceptable coverage) and prevent stormwater run-on and runoff with a berm. The waste containers or piles must be covered except when in use.
- Use drip pans or absorbent materials whenever grease containers are emptied by vacuum trucks or other means. Grease cannot be left on the ground. Collected grease must be properly disposed of as garbage.
- Dispose of rinse and wash water from cleaning waste containers into a sanitary sewer if allowed by the local sewer authority. Do not discharge wash water to the street or storm drain. Clean in a designated wash area that drains to a clarifier.
- Transfer waste from damaged containers into safe containers.
- Take special care when loading or unloading wastes to minimize losses. Loading systems can be used to minimize spills and fugitive emission losses such as dust or mist. Vacuum transfer systems can minimize waste loss.
- Keep the waste management area clean at all times by sweeping and cleaning up spills immediately.
- Use dry methods when possible (e.g., sweeping, use of absorbents) when cleaning around restaurant/food handling dumpster areas. If water must be used after sweeping/using absorbents, collect water and discharge through grease interceptor to the sewer.
- Stencil or demarcate storm drains on the facility's property with prohibitive message regarding waste disposal.
- Cover waste piles with temporary covering material such as reinforced tarpaulin, polyethylene, polyurethane, polypropylene or hypalon.
- If possible, move the activity indoor after ensuring all safety concerns such as fire hazard and ventilation are addressed.

Preventative Maintenance

- Prevent stormwater run-on from entering the waste management area by enclosing the area or building a berm around the area.
- Prevent waste materials from directly contacting rain.

- Cover waste piles with temporary covering material such as reinforced tarpaulin, polyethylene, polyurethane, polypropylene or hypalon.
- Cover the area with a permanent roof if feasible.
- Cover dumpsters to prevent rain from washing waste out of holes or cracks in the bottom of the dumpster.
- Check waste containers weekly for leaks and to ensure that lids are on tightly. Replace any that are leaking, corroded, or otherwise deteriorating.
- Sweep and clean the waste management area regularly. Use dry methods when possible (e.g., sweeping, vacuuming, use of absorbents) when cleaning around restaurant/food handling dumpster areas. If water must be used after sweeping/using absorbents, collect water and discharge through grease interceptor to the sewer.
- Inspect and replace faulty pumps or hoses regularly to minimize the potential of releases and spills.
- Repair leaking equipment including valves, lines, seals, or pumps promptly.

Spill Response and Prevention Procedures

- Keep your spill prevention and plan up-to-date.
- Have an emergency plan, equipment and trained personnel ready at all times to deal immediately with major spills.
- Collect all spilled liquids and properly dispose of them.
- Store and maintain appropriate spill cleanup materials in a location known to all near the designated wash area.
- Ensure that vehicles transporting waste have spill prevention equipment that can prevent spills during transport. Spill prevention equipment includes:
  - ✓ Vehicles equipped with baffles for liquid waste; and
  - ✓ Trucks with sealed gates and spill guards for solid waste.

Material Handling and Waste Management

Litter Control

- Post "No Littering" signs and enforce anti-litter laws.
- Provide a sufficient number of litter receptacles for the facility.
- Clean out and cover litter receptacles frequently to prevent spillage.

Waste Collection

- Keep waste collection areas clean.

- Inspect solid waste containers for structural damage regularly. Repair or replace damaged containers as necessary.
- Secure solid waste containers; containers must be closed tightly when not in use.
- Do not fill waste containers with washout water or any other liquid.
- Ensure that only appropriate solid wastes are added to the solid waste container. Certain wastes such as hazardous wastes, appliances, fluorescent lamps, pesticides, etc., may not be disposed of in solid waste containers (see chemical/ hazardous waste collection section below).
- Do not mix wastes; this can cause chemical reactions, make recycling impossible, and complicate disposal. Affix labels to all waste containers.

Chemical/Hazardous Wastes

- Select designated hazardous waste collection areas on-site.
- Store hazardous materials and wastes in covered containers and protect them from vandalism.
- Place hazardous waste containers in secondary containment.
- Make sure that hazardous waste is collected, removed, and disposed of only at authorized disposal areas.
- Hazardous waste cannot be reused or recycled; it must be disposed of by a licensed hazardous waste hauler.

Employee Training Program

- Educate employees about pollution prevention measures and goals.
- Train employees how to properly handle and dispose of waste using the source control BMPs described above.
- Train employees and subcontractors in proper hazardous waste management.
- Use a training log or similar method to document training.
- Ensure that employees are familiar with the site's spill control plan and/or proper spill cleanup procedures.

Quality Assurance and Record Keeping

- Keep accurate maintenance logs that document minimum BMP activities performed for waste handling and disposal, types and quantities of waste disposed of, and any improvement actions.
- Keep accurate logs of spill response actions that document what was spilled, how it was cleaned up, and how the waste was disposed.

- Establish procedures to complete logs and file them in the central office.

Potential Capital Facility Costs and Operation & Maintenance Requirements

Facilities

- Capital costs will vary substantially depending on the size of the facility and the types of waste handled. Significant capital costs may be associated with reducing wastes by modifying processes or implementing closed-loop recycling.
- Many facilities will already have indoor covered areas where waste materials will be stored and will require no additional capital expenditures for providing cover.
- If outdoor storage of wastes is required, construction of berms or other means to prevent stormwater run-on and runoff may require appropriate constructed systems for containment.
- Capital investments will likely be required at some sites if adequate cover and containment facilities do not exist and can vary significantly depending upon site conditions.

Maintenance

- Check waste containers weekly for leaks and to ensure that lids are on tightly. Replace any that are leaking, corroded, or otherwise deteriorating.
- Sweep and clean the waste management area regularly. Use dry methods when possible (e.g., sweeping, use of absorbents) when cleaning around restaurant/food handling dumpster areas. If water must be used after sweeping/using absorbents, collect water and discharge through grease interceptor to the sewer.
- Inspect and replace faulty pumps or hoses regularly to minimize the potential of releases and spills.
- Repair leaking equipment including valves, lines, seals, or pumps promptly.

References and Resources

Minnesota Pollution Control Agency, *Industrial Stormwater Best Management Practices Guidebook*. Available online at: http://www.pca.state.mn.us/index.php/view-document.html?gid=10557.

New Jersey Department of Environmental Protection, 2013. *Basic Industrial Stormwater General Permit Guidance Document NJPDES General Permit No NJ0088315,* Revised. Available online at: http://www.nj.gov/dep/dwq/pdf/5G2_guidance_color.pdf.

Orange County Stormwater Program, Best Management Practices for Industrial/Commercial Business Activities. Available online at: http://ocwatersheds.com/documents/bmp/industrialcommercialbusinessesactivities

Oregon Department of Environmental Quality, 2013. *Industrial Stormwater Best Management Practices Manual- BMP 26 Fueling and Liquid Loading/Unloading Operations*. Available online at: http://www.deq.state.or.us/wq/wqpermit/docs/IndBMP021413.pdf.

Sacramento Stormwater Management Program. *Best Management Practices for Industrial Storm Water Pollution Control*. Available online at: http://www.msa.saccounty.net/sactostormwater/documents/guides/industrial-BMP-manual.pdf.

Sacramento County Environmental Management Stormwater Program: Best Management Practices. Available online at: http://www.emd.saccounty.net/EnvHealth/Stormwater/Stormwater-BMPs.html.

Santa Clara Valley Urban Runoff Pollution Prevention Program. http://www.scvurppp-w2k.com/

US EPA. National Pollutant Discharge Elimination System – Industrial Fact Sheet Series for Activities Covered by EPA's Multi Sector General Permit. Available online at: http://cfpub.epa.gov/npdes/stormwater/swsectors.cfm.

Safer Alternative Products SC-35

Description

Promote the use of less harmful products and products that contain little or no TMDL and 303(d) list pollutants. Alternatives exist for most product classes including chemical fertilizers, pesticides, cleaning solutions, janitorial chemicals, automotive and paint products, and consumables (batteries, fluorescent lamps).

Approach

Pattern a new program after the many established programs around the state and country. Integrate this best management practice as much as possible with existing programs at your facility.

Develop a comprehensive program based on:

- The "Precautionary Principle," which is an alternative to the "Risk Assessment" model that says it's acceptable to use a potentially harmful product until physical evidence of its harmful effects are established and deemed too costly from an environmental or public health perspective. For instance, a risk assessment approach might say it's acceptable to use a pesticide until there is direct proof of an environmental impact. The Precautionary Principle approach is used to evaluate whether a given product is safe, whether it is really necessary, and whether alternative products would perform just as well.
- Environmentally Preferable Purchasing Program to minimize the purchase of products containing hazardous ingredients used in the facility's custodial services, fleet maintenance, and facility maintenance in favor of using alternate products that pose less risk to employees and to the environment.
- Integrated Pest Management (IPM) or Less-Toxic Pesticide Program, which uses a pest management approach that minimizes the use of toxic chemicals and gets rid of pests

Objectives
■ *Educate*
■ *Reduce/Minimize*
■ *Product Substitution*

Targeted Constituents	
Sediment	
Nutrients	✓
Trash	
Metals	✓
Bacteria	
Oil and Grease	✓
Organics	✓

Minimum BMPs Covered	
Good Housekeeping	
Preventative Maintenance	
Spill and Leak Prevention and Response	
Material Handling & Waste Management	
Erosion and Sediment Controls	
Employee Training Program	✓
Quality Assurance Record Keeping	

CASQA
CALIFORNIA STORMWATER QUALITY ASSOCIATION®

by methods that pose a lower risk to employees, the public, and the environment.

- Energy Efficiency Program including no-cost and low-cost energy conservation and efficiency actions that can reduce both energy consumption and electricity bills, along with long-term energy efficiency investments.

Consider the following mechanisms for developing and implementing a comprehensive program:

- Policies
- Procedures
  - ✓ Standard operating procedures (SOPs);
  - ✓ Purchasing guidelines and procedures; and
  - ✓ Bid packages (services and supplies).
- Materials
  - ✓ Preferred or approved product and supplier lists;
  - ✓ Product and supplier evaluation criteria;
  - ✓ Training sessions and manuals; and
  - ✓ Fact sheets for employees.

Implement this BMP in conjunction with the Vehicle and Equipment Management fact sheets (SC-20 – SC-22) and SC-41 Building and Grounds Maintenance.

Employee Training Program

- Employees who handle potentially harmful materials should be trained in the use of safer alternatives.
- Purchasing departments should be trained on safer alternative products and encouraged to procure less hazardous materials and products that contain little or no harmful substances or TMDL pollutants.
- Employees and contractors / service providers can both be educated about safer alternatives by using information developed by a number of organizations including the references and resources provided in this fact sheet.

Potential Limitations and Work-Arounds

Some facilities may have space constraints, limited staffing and time limitations that may preclude implementation of BMPs. Provided below are typical limitations and recommended "work-arounds"

- Alternative products may not be available, suitable, or effective in every case.

- ✓ Minimize use of hazardous/harmful products if no alternative product is available.

Regulatory Considerations

This BMP has no regulatory requirements unless local/municipal ordinance applies. Existing regulations already encourage facilities to reduce the use of hazardous materials through incentives such as reduced:

- Specialized equipment storage and handling requirements;
- Storm water runoff sampling requirements;
- Training and licensing requirements; and
- Record keeping and reporting requirements.

Cost Considerations

- The primary cost is for staff time to: 1) develop new policies and procedures and 2) educate purchasing departments and employees who handle potentially harmful materials about the availability, procurement, and use of safer alternatives.
- Some alternative products may be slightly more expensive than conventional products.

Supplemental Information

The following discussion provides some general information on safer alternatives. More specific information on particular hazardous materials and the available alternatives may be found in the references and resources listed below.

- Automotive products – Less toxic alternatives are not available for many automotive products, especially engine fluids. But there are alternatives to grease lubricants, car polishes, degreasers, and windshield washer solution. Refined motor oil is also available.
- Vehicle/Trailer lubrication – Fifth wheel bearings on trucks require routine lubrication. Adhesive lubricants are available to replace typical chassis grease.
- Cleaners – Vegetables-based or citrus-based soaps are available to replace petroleum-based soaps/detergents.
- Paint products – Water-based paints, wood preservatives, stains, and finishes with low VOC content are available.
- Pesticides – Specific alternative products or methods exist to control most insects, fungi, and weeds.
- Chemical Fertilizers – Compost and soil amendments are natural alternatives.
- Consumables – Manufacturers have either reduced or are in the process of reducing the amount of heavy metals in consumables such as batteries and fluorescent lamps.

All fluorescent lamps contain mercury, however low-mercury containing lamps are now available from most hardware and lighting stores. Fluorescent lamps are also more energy efficient than the average incandescent lamp.

- Janitorial chemicals – Even biodegradable soap can harm fish and wildlife before it biodegrades. Biodegradable does not mean non-toxic. Safer products and procedures are available for floor stripping and cleaning, as well as carpet, glass, metal, and restroom cleaning and disinfecting. Use paper products with post-consumer recycled content and implement electric had dryers.

Examples

There are a number of business and trade associations, and communities with effective programs. Some of the more prominent are listed below in the references and resources section.

References and Resources

Note: Many of these references provide alternative products for materials that typically are used inside and disposed to the sanitary sewer as well as alternatives to products that usually end up in the storm drain.

General Sustainable Practices and Pollution Prevention Including Pollutant-Specific Information

California Department of Toxic Substances Control, http://www.dtsc.ca.gov/PollutionPrevention/GreenTechnology/Index.cfm.

CalRecycle, http://www.calrecycle.ca.gov/Business/Regulated.htm.

City of Santa Monica Office of Sustainability and Environment, http://www.smgov.net/departments/ose/.

City of Palo Alto, http:// www.city.palo-alto.ca.us/cleanbay.

City and County of San Francisco, Department of the Environment, http://www.sfenvironment.org/toxics-health/greener-business-practices.

Green Business Program, http://www.greenbiz.ca.gov/GRlocal.html .

Product Stewardship Institute, http://www.productstewardship.us/index.cfm.

Sacramento Clean Water Business Partners. http://www.sacstormwater.org/CleanWaterBusinessPartners/CleanWaterBusinessPartners.html.

USEPA. National Pollutant Discharge Elimination System (NPDES) Stormwater Discharges From Industrial Facilities, http://cfpub.epa.gov/npdes/stormwater/indust.cfm.

USEPA Region IX Pollution Prevention Program, http://www.epa.gov/region9/waste/p2/business.html.

Western Sustainability and Pollution Prevention Network, http://wsppn.org/.

Metals (mercury, copper)

National Electrical Manufacturers Association – Environmental Stewardship, http://www.nema.org/Policy/Environmental-Stewardship/pages/default.aspx.

Sustainable Conservation, http://www.suscon.org.

Auto Recycling Project

Brake Pad Partnership

Pesticides and Chemical Fertilizers

Bio-Integral Resource Center, http://www.birc.org.

California Department of Pesticide Regulation, http://www.cdpr.ca.gov/dprprograms.htm.

University of California Statewide IPM Program, http://www.ipm.ucdavis.edu/default.html.

Dioxins

Bay Area Dioxins Project, http://www.abag.ca.gov/bayarea/dioxin/project_materials.htm.

Building & Grounds Maintenance SC-41

Description

Stormwater runoff from building and grounds maintenance activities can be contaminated with toxic hydrocarbons in solvents, fertilizers and pesticides, suspended solids, heavy metals, abnormal pH, and oils and greases. Utilizing the protocols in this fact sheet will prevent or reduce the discharge of pollutants to stormwater from building and grounds maintenance activities by washing and cleaning up with as little water as possible, following good landscape management practices, preventing and cleaning up spills immediately, keeping debris from entering the storm drains, and maintaining the stormwater collection system.

Approach

Reduce potential for pollutant discharge through source control pollution prevention and BMP implementation. Successful implementation depends on effective training of employees on applicable BMPs and general pollution prevention strategies and objectives.

General Pollution Prevention Protocols

- ☐ Switch to non-toxic chemicals for maintenance to the maximum extent possible.
- ☐ Choose cleaning agents that can be recycled.
- ☐ Encourage proper lawn management and landscaping, including use of native vegetation.
- ☐ Encourage use of Integrated Pest Management techniques for pest control.
- ☐ Encourage proper onsite recycling of yard trimmings.
- ☐ Recycle residual paints, solvents, lumber, and other material as much as possible.

Objectives
■ *Cover*
■ *Contain*
■ *Educate*
■ *Reduce/Minimize*
■ *Product Substitution*

Targeted Constituents	
Sediment	✓
Nutrients	✓
Trash	
Metals	✓
Bacteria	✓
Oil and Grease	
Organics	

Minimum BMPs Covered	
Good Housekeeping	✓
Preventative Maintenance	
Spill and Leak Prevention and Response	✓
Material Handling & Waste Management	✓
Erosion and Sediment Controls	
Employee Training Program	✓
Quality Assurance Record Keeping	✓

CASQA
CALIFORNIA STORMWATER QUALITY ASSOCIATION®

- Clean work areas at the end of each work shift using dry cleaning methods such as sweeping and vacuuming.

Good Housekeeping

Pressure Washing of Buildings, Rooftops, and Other Large Objects

- In situations where soaps or detergents are used and the surrounding area is paved, pressure washers must use a water collection device that enables collection of wash water and associated solids. A sump pump, wet vacuum or similarly effective device must be used to collect the runoff and loose materials. The collected runoff and solids must be disposed of properly.

- If soaps or detergents are not used, and the surrounding area is paved, wash runoff does not have to be collected but must be screened. Pressure washers must use filter fabric or some other type of screen on the ground and/or in the catch basin to trap the particles in wash water runoff.

- If you are pressure washing on a grassed area (with or without soap), runoff must be dispersed as sheet flow as much as possible, rather than as a concentrated stream. The wash runoff must remain on the grass and not drain to pavement.

Landscaping Activities

- Dispose of grass clippings, leaves, sticks, or other collected vegetation as garbage, or by composting. Do not dispose of collected vegetation into waterways or storm drainage systems.

- Use mulch or other erosion control measures on exposed soils. See also SC-40, Contaminated and Erodible Areas, for more information.

Building Repair, Remodeling, and Construction

- Do not dump any toxic substance or liquid waste on the pavement, the ground, or toward a storm drain.

- Use ground or drop cloths underneath outdoor painting, scraping, and sandblasting work, and properly dispose of collected material daily.

- Use a ground cloth or oversized tub for activities such as paint mixing and tool cleaning.

- Clean paintbrushes and tools covered with water-based paints in sinks connected to sanitary sewers or in portable containers that can be dumped into a sanitary sewer drain. Brushes and tools covered with non-water-based paints, finishes, or other materials must be cleaned in a manner that enables collection of used solvents (e.g., paint thinner, turpentine, etc.) for recycling or proper disposal.

- Use a storm drain cover, filter fabric, or similarly effective runoff control mechanism if dust, grit, wash water, or other pollutants may escape the work area and enter a catch basin. This is particularly necessary on rainy days. The containment device(s) must be in place at the beginning of the work day, and accumulated dirty runoff and

solids must be collected and disposed of before removing the containment device(s) at the end of the work day.

- If you need to de-water an excavation site, you may need to filter the water before discharging to a catch basin or off-site. If directed off-site, you should direct the water through hay bales and filter fabric or use other sediment filters or traps.
- Store toxic material under cover during precipitation events and when not in use. A cover would include tarps or other temporary cover material.

Mowing, Trimming, and Planting

- Dispose of leaves, sticks, or other collected vegetation as garbage, by composting or at a permitted landfill. Do not dispose of collected vegetation into waterways or storm drainage systems.
- Use mulch or other erosion control measures when soils are exposed.
- Place temporarily stockpiled material away from watercourses and drain inlets, and berm or cover stockpiles to prevent material releases to the storm drain system.
- Consider an alternative approach when bailing out muddy water: do not put it in the storm drain; pour over landscaped areas.
- Use hand weeding where practical.

Fertilizer and Pesticide Management

- Do not use pesticides if rain is expected.
- Do not mix or prepare pesticides for application near storm drains.
- Use the minimum amount needed for the job.
- Calibrate fertilizer distributors to avoid excessive application.
- Employ techniques to minimize off-target application (e.g., spray drift) of pesticides, including consideration of alternative application techniques.
- Apply pesticides only when wind speeds are low.
- Fertilizers should be worked into the soil rather than dumped or broadcast onto the surface.
- Irrigate slowly to prevent runoff and then only as much as is needed.
- Clean pavement and sidewalk if fertilizer is spilled on these surfaces before applying irrigation water.

Inspection

- Inspect irrigation system periodically to ensure that the right amount of water is being applied and that excessive runoff is not occurring. Minimize excess watering and repair leaks in the irrigation system as soon as they are observed.

Building & Grounds Maintenance SC-41

Spill Response and Prevention Procedures

- Keep your Spill Prevention Control and Countermeasure (SPCC) Plan up-to-date.
- Place a stockpile of spill cleanup materials, such as brooms, dustpans, and vacuum sweepers (if desired) near the storage area where it will be readily accessible.
- Have employees trained in spill containment and cleanup present during the loading/unloading of dangerous wastes, liquid chemicals, or other materials.
- Familiarize employees with the Spill Prevention Control and Countermeasure Plan.
- Clean up spills immediately.

Material Handling and Waste Management

- Follow all federal, state, and local laws and regulations governing the use, storage, and disposal of fertilizers and pesticides and training of applicators and pest control advisors.
- Use less toxic pesticides that will do the job when applicable. Avoid use of copper-based pesticides if possible.
- Dispose of empty pesticide containers according to the instructions on the container label.
- Use up the pesticides. Rinse containers, and use rinse water as product. Dispose of unused pesticide as hazardous waste.
- Implement storage requirements for pesticide products with guidance from the local fire department and County Agricultural Commissioner. Provide secondary containment for pesticides.

Employee Training Program

- Educate and train employees on pesticide use and in pesticide application techniques to prevent pollution.
- Train employees and contractors in proper techniques for spill containment and cleanup.
- Be sure the frequency of training takes into account the complexity of the operations and the needs of individual staff.

Quality Assurance and Record Keeping

- Keep accurate logs that document maintenance activities performed and minimum BMP measures implemented.
- Keep accurate logs of spill response actions that document what was spilled, how it was cleaned up, and how the waste was disposed.
- Establish procedures to complete logs and file them in the central office.

Potential Capital Facility Costs and Operation & Maintenance Requirements

Facilities

- Additional capital costs are not anticipated for building and grounds maintenance. Implementation of the minimum BMPs described above should be conducted as part of regular site operations.

Maintenance

- Maintenance activities for the BMPs described above will be minimal, and no additional cost is anticipated.

Supplemental Information

Fire Sprinkler Line Flushing

Site fire sprinkler line flushing may be a source of non-stormwater runoff pollution. The water entering the system is usually potable water, though in some areas it may be non-potable reclaimed wastewater. There are subsequent factors that may drastically reduce the quality of the water in such systems. Black iron pipe is usually used since it is cheaper than potable piping, but it is subject to rusting and results in lower quality water. Initially, the black iron pipe has an oil coating to protect it from rusting between manufacture and installation; this will contaminate the water from the first flush but not from subsequent flushes. Nitrates, poly-phosphates and other corrosion inhibitors, as well as fire suppressants and antifreeze may be added to the sprinkler water system. Water generally remains in the sprinkler system a long time (typically a year) and between flushes may accumulate iron, manganese, lead, copper, nickel, and zinc. The water generally becomes anoxic and contains living and dead bacteria and breakdown products from chlorination. This may result in a significant BOD problem and the water often smells. Consequently dispose fire sprinkler line flush water into the sanitary sewer. Do not allow discharge to storm drain or infiltration due to potential high levels of pollutants in fire sprinkler line water.

References and Resources

City of Seattle, Seattle Public Utilities Department of Planning and Development, 2009. *Stormwater Manual Vol. 1 Source Control Technical Requirements Manual.*

Kennedy/Jenks Consultants, 2007. *The Truckee Meadows Industrial and Commercial Storm Water Best Management Practices Handbook*. Available online at: http://www.cityofsparks.us/sites/default/files/assets/documents/env-control/construction/TM-I-C_BMP_Handbook_2-07-final.pdf.

Orange County Stormwater Program, Best Management Practices for Industrial/Commercial Business Activities. Available online at: http://ocwatersheds.com/documents/bmp/industrialcommercialbusinessesactivities.

Sacramento Stormwater Management Program. *Best Management Practices for Industrial Storm Water Pollution Control*. Available online at:

http://www.msa.saccounty.net/sactostormwater/documents/guides/industrial-BMP-manual.pdf.

US EPA, 1997. *Best Management Practices Handbook for Hazardous Waste Containers*. Available online at: http://www.epa.gov/region6/6en/h/handbk4.pdf.

Ventura Countywide Stormwater Management Program Clean Business Fact Sheets. Available online at: http://www.vcstormwater.org/documents/programs_business/building.pdf.

Building Repair and Construction SC-42

Description

Site modifications are common, particularly at large industrial sites. The activity may vary from minor and normal building repair to major remodeling, or the construction of new facilities. These activities can generate pollutants including solvents, paints, paint and varnish removers, finishing residues, spent thinners, soap cleaners, kerosene, asphalt and concrete materials, adhesive residues, and old asbestos installation. Protocols in this fact sheet are intended to prevent or reduce the discharge of pollutants to stormwater from building repair, remodeling, and minor construction by using soil erosion controls, enclosing or covering building material storage areas, using good housekeeping practices, using safer alternative products, and training employees.

This fact sheet is intended to be used for minor repairs and construction. If major construction is required, the guidelines in the Construction BMP Handbook should be followed.

Approach

The BMP approach is to reduce potential for pollutant discharges through source control pollution prevention and BMP implementation. Successful implementation depends on effective training of employees on applicable BMPs and general pollution prevention strategies and objectives.

General Pollution Prevention Protocols

- ☐ Recycle residual paints, solvents, lumber, and other materials to the maximum extent practicable.
- ☐ Avoid outdoor repairs and construction during periods of wet weather.
- ☐ Use safer alternative products to the maximum extent practicable. See also SC-35 Safer Alternative Products for more information.

Objectives
■ *Cover*
■ *Contain*
■ *Educate*
■ *Reduce/Minimize*
■ *Product Substitution*

Targeted Constituents	
Sediment	✓
Nutrients	
Trash	✓
Metals	✓
Bacteria	
Oil and Grease	✓
Organics	✓

Minimum BMPs Covered	
Good Housekeeping	✓
Preventative Maintenance	
Spill and Leak Prevention and Response	✓
Material Handling & Waste Management	✓
Erosion and Sediment Controls	✓
Employee Training Program	✓
Quality Assurance Record Keeping	✓

CASQA
CALIFORNIA STORMWATER QUALITY ASSOCIATION®

- Buy recycled products to the maximum extent practicable.
- Inform on-site contractors of company policy on these matters and include appropriate provisions in their contract to ensure certain proper housekeeping and disposal practices are implemented.
- Make sure that nearby storm drains are well marked to minimize the chance of inadvertent disposal of residual paints and other liquids.

Good Housekeeping

Repair & Remodeling

- Keep the work site clean and orderly. Remove debris in a timely fashion. Sweep and vacuum the area regularly to remove sediments and small debris.
- Cover raw materials of particular concern that must be left outside, particularly during the rainy season. See also SC-33 Outdoor Storage of Raw Materials for more information.
- Use equipment and tools such as bag sanders to reduce accumulation of debris.
- Limit/prohibit work on windy days; implement roll-down walls or other measures to reduce wind transport of pollutants.
- Do not dump waste liquids down the storm drain.
- Dispose of wash water, sweepings, and sediments properly.
- Store liquid materials properly that are normally used in repair and remodeling such as paints and solvents. See also SC-31 Outdoor Liquid Container Storage for more information.
- Sweep out rain gutters or wash the gutter and trap the particles at the outlet of the downspout. A sock or geofabric placed over the outlet may effectively trap the materials. If the downspout is tight lined, place a temporary plug at the first convenient point in the storm drain and pump out the water with a vactor truck, and clean the catch basin sump where you placed the plug.
- Clean the storm drain system in the immediate vicinity of the construction activity after it is completed. See also SC-44 Drainage System Maintenance for more information.

Painting

- Enclose painting operations consistent with local air quality regulations and OSHA.
- Local air pollution regulations may, in many areas of the state, specify painting procedures which if properly carried out are usually sufficient to protect water quality.
- Develop paint handling procedures for proper use, storage, and disposal of paints.

- Transport paint and materials to and from job sites in containers with secure lids and tied down to the transport vehicle.
- Test and inspect spray equipment prior to starting to paint. Tighten all hoses and connections and do not overfill paint containers.
- Mix paint indoors before using so that any spill will not be exposed to rain. Do so even during dry weather because cleanup of a spill will never be 100 percent effective.
- Transfer and load paint and hot thermoplastic away from storm drain inlets.
- Do not transfer or load paint near storm drain inlets.
- Plug nearby storm drain inlets prior to starting painting and remove plugs when job is complete when there is risk of a spill reaching storm drains.
- Cover nearby storm drain inlets prior to starting work if sand blasting is used to remove paint.
- Use a ground cloth to collect the chips if painting requires scraping or sand blasting of the existing surface. Dispose of the residue properly.
- Cover or enclose painting operations properly to avoid drift.
- Clean the application equipment in a sink that is connected to the sanitary sewer if using water based paints.
- Capture all cleanup-water and dispose of properly.
- Dispose of paints containing lead or tributyl tin and considered a hazardous waste properly.
- Store leftover paints if they are to be kept for the next job properly, or dispose properly.
- Recycle paint when possible. Dispose of paint at an appropriate household hazardous waste facility.

Spill Response and Prevention Procedures

- Keep your spill prevention and control plan up-to-date.
- Place a stockpile of spill cleanup materials where it will be readily accessible.
- Clean up spills immediately.
- Excavate and remove the contaminated (stained) soil if a spill occurs on dirt.

Material Handling and Waste Management

- Post “No Littering” signs and enforce anti-litter laws.

- Provide a sufficient number of litter receptacles for the facility.
- Clean out and cover litter receptacles frequently to prevent spillage.
- Keep waste collection areas clean.
- Inspect solid waste containers for structural damage regularly. Repair or replace damaged containers as necessary.
- Secure solid waste containers; containers must be closed tightly when not in use.
- Do not fill waste containers with washout water or any other liquid.
- Ensure that only appropriate solid wastes are added to the solid waste container. Certain wastes such as hazardous wastes, appliances, fluorescent lamps, pesticides, etc., may not be disposed of in solid waste containers (see chemical/ hazardous waste collection section below).
- Do not mix wastes; this can cause chemical reactions, make recycling impossible, and complicate disposal. Affix labels to all waste containers.
- Make sure that hazardous waste is collected, removed, and disposed of properly. See also SC-34, Waste Handling and Disposal for more information.

Sediment and Erosion Controls

- Limit disturbance to bare soils and preserve natural vegetation whenever possible. See also EC-2, Preservation of Existing Vegetation, in the Construction BMP Handbook.
- Stabilize loose soils by re-vegetating whenever possible. See also EC-4 Hydroseeding, in the Construction BMP Handbook.
- Utilize non-vegetative stabilization methods for areas prone to erosion where vegetative options are not feasible. Examples include:
  - ✓ Areas of vehicular or pedestrian traffic such as roads or paths;
  - ✓ Arid environments where vegetation would not provide timely ground coverage, or would require excessive irrigation;
  - ✓ Rocky substrate, infertile or droughty soils where vegetation would be difficult to establish; and
  - ✓ Areas where vegetation will not grow adequately within the construction time frame.

  There are several non-vegetative stabilization methods and selection should be based on site-specific conditions. See also EC-16 Non-Vegetative Stabilization, in the Construction BMP Handbook.

- Utilize chemical stabilization when needed. See also EC-5 Soil Binders, in the Construction BMP Handbook.
- Use geosynthetic membranes to control erosion if feasible. See also EC-7 Geotextiles and Mats, in the Construction BMP Handbook.
- Stabilize all roadways, entrances, and exits to sufficiently control discharges of erodible materials from discharging or being tracked off the site. See also TC 1-3 Tracking Control, in the Construction BMP Handbook.
- Refer to the supplemental information provided below for projects that involve more extensive soil disturbance activities.

Employee Training Program

- Educate employees about pollution prevention measures and goals.
- Train employees how to properly implement the source control BMPs described above. Detailed information for Sediment and Erosion Control BMPs is provided in the Construction BMP Handbook.
- Proper education of off-site contractors is often overlooked. The conscientious efforts of well trained employees can be lost by unknowing off-site contractors, so make sure they are well informed about pollutant source control responsibilities.
- Use a training log or similar method to document training.

Quality Assurance and Record Keeping

- Keep accurate maintenance logs that document minimum BMP activities performed for building repair and construction, types and quantities of waste disposed of, and any improvement actions.
- Keep accurate logs of spill response actions that document what was spilled, how it was cleaned up, and how the waste was disposed.
- Establish procedures to complete logs and file them in the central office.

Potential Limitations and Work-Arounds

Some facilities may have space constraints, limited staffing and time limitations that may preclude implementation of BMPs. Provided below are typical limitations and recommended "work-arounds."

- This BMP is for minor construction only. The State's General Construction Activity Stormwater Permit has more extensive requirements for larger projects that would disturb one or more acres of surface.
  - ✓ Refer to the companion "Construction Best Management Practice Handbook" which contains specific guidance and best management practices for larger-scale projects.

- Time constraints may require some outdoor repairs and construction during wet weather.
  - ✓ Require employees to understand and follow good housekeeping and spill and leak prevention BMPs.
  - ✓ Inspect sediment and erosion control BMPs daily during periods of wet weather and repair or improve BMP implementation as necessary.
- Hazardous waste that cannot be reused or recycled must be disposed of by a licensed hazardous waste hauler.
  - ✓ Minimize use of hazardous materials to the maximum extent practicable.
- Be certain that actions to help stormwater quality are consistent with Cal- and Fed-OSHA and air quality regulations.
- Prices for recycled/safer alternative materials and fluids may be higher than those of conventional materials.

Potential Capital Facility Costs and Operation & Maintenance Requirements

Facilities

- Limited capital investments may be required at some sites if adequate cover and containment facilities do not exist for construction materials and wastes.
- Purchase and installation of erosion and sediment controls, if needed will require additional capital investments, and this amount will vary depending on site characteristics and the types of BMPs being implemented.
- Minimize costs by maintaining existing vegetation and limiting construction operations on bare soils.

Maintenance

- The erosion and sediment control BMPs described above require periodic inspection and maintenance to remain effective. The cost of these actions will vary depending on site characteristics and the types of BMPs being implemented.
- Irrigation costs may be required to establish and maintain vegetation.

Supplemental Information

Soil/Erosion Control

If the work involves exposing large areas of soil, employ the appropriate soil erosion and control techniques. See the Construction Best Management Practice Handbook. If old buildings are being torn down and not replaced in the near future, stabilize the site using measures described in SC-40 Contaminated or Erodible Areas.

Building Repair and Construction SC-42

If a building is to be placed over an open area with a storm drainage system, make sure the storm inlets within the building are covered or removed, or the storm line is connected to the sanitary sewer. If because of the remodeling a new drainage system is to be installed or the existing system is to be modified, consider installing catch basins as they serve as effective "in-line" treatment devices. Include in the catch basin a "turn-down" elbow or similar device to trap floatables.

References and Resources

City of Seattle, Seattle Public Utilities Department of Planning and Development, 2009. *Stormwater Manual Vol. 1 Source Control Technical Requirements Manual*.

California Stormwater Quality Association, 2012. *Construction Stormwater Best Management Practice Handbook*. Available at http://www.casqa.org.

Kennedy/Jenks Consultants, 2007. *The Truckee Meadows Industrial and Commercial Storm Water Best Management Practices Handbook*. Available online at: http://www.cityofsparks.us/sites/default/files/assets/documents/env-control/construction/TM-I-C_BMP_Handbook_2-07-final.pdf.

Sacramento Stormwater Management Program. *Best Management Practices for Industrial Storm Water Pollution Control*. Available online at: http://www.msa.saccounty.net/sactostormwater/documents/guides/industrial-BMP-manual.pdf.

US EPA. *Construction Site Stormwater Runoff Control*. Available online at: http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=min_measure&min_measure_id=4.

Parking Area Maintenance SC-43

Description

Parking lots can contribute a number of substances, such as trash, suspended solids, hydrocarbons, oil and grease, and heavy metals that can enter receiving waters through stormwater runoff or non-stormwater discharges. The protocols in this fact sheet are intended to prevent or reduce the discharge of pollutants from parking areas and include using good housekeeping practices, following appropriate cleaning BMPs, and training employees.

BMPs for other outdoor areas on site (loading/unloading, material storage, and equipment operations) are described in SC-30 through SC-33.

Approach

The goal of this program is to ensure stormwater pollution prevention practices are considered when conducting activities on or around parking areas to reduce potential for pollutant discharge to receiving waters. Successful implementation depends on effective training of employees on applicable BMPs and general pollution prevention strategies and objectives.

General Pollution Prevention Protocols

- Encourage advanced designs and maintenance strategies for impervious parking lots. Refer to the treatment control BMP fact sheets in this manual for additional information.
- Keep accurate maintenance logs to evaluate BMP implementation.

Good Housekeeping

- Keep all parking areas clean and orderly. Remove debris, litter, and sediments in a timely fashion.
- Post "No Littering" signs and enforce anti-litter laws.

Objectives
Cover
Contain
Educate
Reduce/Minimize
Product Substitution

Targeted Constituents	
Sediment	✓
Nutrients	
Trash	✓
Metals	✓
Bacteria	
Oil and Grease	✓
Organics	✓

Minimum BMPs Covered	
Good Housekeeping	✓
Preventative Maintenance	✓
Spill and Leak Prevention and Response	✓
Material Handling & Waste Management	
Erosion and Sediment Controls	
Employee Training Program	✓
Quality Assurance Record Keeping	✓

CASQA
CALIFORNIA STORMWATER QUALITY ASSOCIATION®

- ☐ Provide an adequate number of litter receptacles.
- ☐ Clean out and cover litter receptacles frequently to prevent spillage.

Preventative Maintenance

Inspection

Have designated personnel conduct inspections of parking facilities and stormwater conveyance systems associated with parking facilities on a regular basis.

- ☐ Inspect cleaning equipment/sweepers for leaks on a regular basis.

Surface Cleaning

- ☐ Use dry cleaning methods (e.g., sweeping, vacuuming) to prevent the discharge of pollutants into the stormwater conveyance system if possible.
- ☐ Establish frequency of public parking lot sweeping based on usage and field observations of waste accumulation.
- ☐ Sweep all parking lots at least once before the onset of the wet season.
- ☐ Dispose of parking lot sweeping debris and dirt at a landfill.
- ☐ Follow the procedures below if water is used to clean surfaces:
  - ✓ Block the storm drain or contain runoff.
  - ✓ Collect and pump wash water to the sanitary sewer or discharge to a pervious surface. Do not allow wash water to enter storm drains.
- ☐ Follow the procedures below when cleaning heavy oily deposits:
  - ✓ Clean oily spots with absorbent materials.
  - ✓ Use a screen or filter fabric over inlet, then wash surfaces.
  - ✓ Do not allow discharges to the storm drain.
  - ✓ Vacuum/pump discharges to a tank or discharge to sanitary sewer.
  - ✓ Dispose of spilled materials and absorbents appropriately.

Surface Repair

- ☐ Check local ordinance for SUSMP/LID ordinance.
- ☐ Preheat, transfer or load hot bituminous material away from storm drain inlets.
- ☐ Apply concrete, asphalt, and seal coat during dry weather to prevent contamination from contacting stormwater runoff.
- ☐ Cover and seal nearby storm drain inlets where applicable (with waterproof material or mesh) and manholes before applying seal coat, slurry seal, etc. Leave covers in

place until job is complete and all water from emulsified oil sealants has drained or evaporated. Clean any debris from these covered manholes and drains for proper disposal.

- Use only as much water as necessary for dust control during sweeping to avoid runoff.
- Catch drips from paving equipment that is not in use with pans or absorbent material placed under the machines. Dispose of collected material and absorbents properly.

Spill Response and Prevention Procedures

- Keep your Spill Prevention Control and Countermeasure (SPCC) Plan up-to-date.
- Place a stockpile of spill cleanup materials where it will be readily accessible or at a central location.
- Clean up fluid spills immediately with absorbent rags or material.
- Dispose of spilled material and absorbents properly.

Employee Training Program

- Provide regular training to field employees and/or contractors regarding cleaning of paved areas and proper operation of equipment.
- Train employees and contractors in proper techniques for spill containment and cleanup.
- Use a training log or similar method to document training.

Quality Assurance and Record Keeping

- Keep accurate maintenance logs that document minimum BMP activities performed for parking area maintenance, types and quantities of waste disposed of, and any improvement actions.
- Keep accurate logs of spill response actions that document what was spilled, how it was cleaned up, and how the waste was disposed.
- Establish procedures to complete logs and file them in the central office.

Potential Capital Facility Costs and Operation & Maintenance Requirements

Facilities

- Capital investments may be required at some sites to purchase sweeping equipment, train sweeper operators, install oil/water/sand separators, or implement advanced BMPs. These costs can vary significantly depending upon site conditions and the amount of BMPs required.

Maintenance

- Sweep and clean parking lots regularly to minimize pollutant transport into storm drains from stormwater runoff.
- Clean out oil/water/sand separators regularly, especially after heavy storms.
- Maintain advanced BMPs such as vegetated swales, infiltration trenches, or detention basins as appropriate. Refer to the treatment control fact sheets for more information.

Supplemental Information

Advanced BMPs

Some parking areas may require advanced BMPs to further reduce pollutants in stormwater runoff, and a few examples are listed below. Refer to the Treatment Control Fact Sheets and the New Development and Redevelopment Manual for more information.

- When possible, direct sheet runoff to flow into biofilters (vegetated strip and swale) and/or infiltration devices.
- Utilize sand filters or oleophilic collectors for oily waste in low quantities.
- Arrange rooftop drains to prevent drainage directly onto paved surfaces.
- Design lot to include semi-permeable hardscape.

References and Resources

City of Seattle, Seattle Public Utilities Department of Planning and Development, 2009. *Stormwater Manual Vol. 1 Source Control Technical Requirements Manual.*

California Stormwater Quality Association, 2003. *New Development and Redevelopment Stormwater Best Management Practice Handbook*. Available online at: https://www.casqa.org/resources/bmp-handbooks/new-development-redevelopment-bmp-handbook.

Kennedy/Jenks Consultants, 2007. *The Truckee Meadows Industrial and Commercial Storm Water Best Management Practices Handbook*. Available online at: http://www.cityofsparks.us/sites/default/files/assets/documents/env-control/construction/TM-I-C_BMP_Handbook_2-07-final.pdf.

Orange County Stormwater Program, Best Management Practices for Industrial/Commercial Business Activities. Available online at: http://ocwatersheds.com/documents/bmp/industrialcommercialbusinessesactivities.

Pollution from Surface Cleaning Folder, 1996, 2003. Bay Area Stormwater Management Agencies Association. Available online at: http://basmaa.org/Portals/0/documents/pdf/Pollution%20from%20Surface%20Cleaning.pdf.

Sacramento Stormwater Management Program. *Best Management Practices for Industrial Storm Water Pollution Control*. Available online at: http://www.msa.saccounty.net/sactostormwater/documents/guides/industrial-BMP-manual.pdf.

The Storm Water Managers Resource Center, http://www.stormwatercenter.net.

US EPA. *Post-Construction Stormwater Management in New Development and Redevelopment*. BMP Fact Sheets. Available online at: http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=min_measure&min_measure_id=5.

Parking Area Maintenance SC-43

Description

Parking lots can contribute a number of substances, such as trash, suspended solids, hydrocarbons, oil and grease, and heavy metals that can enter receiving waters through stormwater runoff or non-stormwater discharges. The protocols in this fact sheet are intended to prevent or reduce the discharge of pollutants from parking areas and include using good housekeeping practices, following appropriate cleaning BMPs, and training employees.

BMPs for other outdoor areas on site (loading/unloading, material storage, and equipment operations) are described in SC-30 through SC-33.

Approach

The goal of this program is to ensure stormwater pollution prevention practices are considered when conducting activities on or around parking areas to reduce potential for pollutant discharge to receiving waters. Successful implementation depends on effective training of employees on applicable BMPs and general pollution prevention strategies and objectives.

General Pollution Prevention Protocols

- Encourage advanced designs and maintenance strategies for impervious parking lots. Refer to the treatment control BMP fact sheets in this manual for additional information.
- Keep accurate maintenance logs to evaluate BMP implementation.

Good Housekeeping

- Keep all parking areas clean and orderly. Remove debris, litter, and sediments in a timely fashion.
- Post "No Littering" signs and enforce anti-litter laws.

Objectives
Cover
Contain
Educate
Reduce/Minimize
Product Substitution

Targeted Constituents	
Sediment	✓
Nutrients	
Trash	✓
Metals	✓
Bacteria	
Oil and Grease	✓
Organics	✓

Minimum BMPs Covered	
Good Housekeeping	✓
Preventative Maintenance	✓
Spill and Leak Prevention and Response	✓
Material Handling & Waste Management	
Erosion and Sediment Controls	
Employee Training Program	✓
Quality Assurance Record Keeping	✓

CASQA
CALIFORNIA STORMWATER QUALITY ASSOCIATION®

- ☐ Provide an adequate number of litter receptacles.
- ☐ Clean out and cover litter receptacles frequently to prevent spillage.

Preventative Maintenance

Inspection

Have designated personnel conduct inspections of parking facilities and stormwater conveyance systems associated with parking facilities on a regular basis.

- ☐ Inspect cleaning equipment/sweepers for leaks on a regular basis.

Surface Cleaning

- ☐ Use dry cleaning methods (e.g., sweeping, vacuuming) to prevent the discharge of pollutants into the stormwater conveyance system if possible.
- ☐ Establish frequency of public parking lot sweeping based on usage and field observations of waste accumulation.
- ☐ Sweep all parking lots at least once before the onset of the wet season.
- ☐ Dispose of parking lot sweeping debris and dirt at a landfill.
- ☐ Follow the procedures below if water is used to clean surfaces:
  - ✓ Block the storm drain or contain runoff.
  - ✓ Collect and pump wash water to the sanitary sewer or discharge to a pervious surface. Do not allow wash water to enter storm drains.
- ☐ Follow the procedures below when cleaning heavy oily deposits:
  - ✓ Clean oily spots with absorbent materials.
  - ✓ Use a screen or filter fabric over inlet, then wash surfaces.
  - ✓ Do not allow discharges to the storm drain.
  - ✓ Vacuum/pump discharges to a tank or discharge to sanitary sewer.
  - ✓ Dispose of spilled materials and absorbents appropriately.

Surface Repair

- ☐ Check local ordinance for SUSMP/LID ordinance.
- ☐ Preheat, transfer or load hot bituminous material away from storm drain inlets.
- ☐ Apply concrete, asphalt, and seal coat during dry weather to prevent contamination from contacting stormwater runoff.
- ☐ Cover and seal nearby storm drain inlets where applicable (with waterproof material or mesh) and manholes before applying seal coat, slurry seal, etc. Leave covers in

place until job is complete and all water from emulsified oil sealants has drained or evaporated. Clean any debris from these covered manholes and drains for proper disposal.

- Use only as much water as necessary for dust control during sweeping to avoid runoff.
- Catch drips from paving equipment that is not in use with pans or absorbent material placed under the machines. Dispose of collected material and absorbents properly.

Spill Response and Prevention Procedures

- Keep your Spill Prevention Control and Countermeasure (SPCC) Plan up-to-date.
- Place a stockpile of spill cleanup materials where it will be readily accessible or at a central location.
- Clean up fluid spills immediately with absorbent rags or material.
- Dispose of spilled material and absorbents properly.

Employee Training Program

- Provide regular training to field employees and/or contractors regarding cleaning of paved areas and proper operation of equipment.
- Train employees and contractors in proper techniques for spill containment and cleanup.
- Use a training log or similar method to document training.

Quality Assurance and Record Keeping

- Keep accurate maintenance logs that document minimum BMP activities performed for parking area maintenance, types and quantities of waste disposed of, and any improvement actions.
- Keep accurate logs of spill response actions that document what was spilled, how it was cleaned up, and how the waste was disposed.
- Establish procedures to complete logs and file them in the central office.

Potential Capital Facility Costs and Operation & Maintenance Requirements

Facilities

- Capital investments may be required at some sites to purchase sweeping equipment, train sweeper operators, install oil/water/sand separators, or implement advanced BMPs. These costs can vary significantly depending upon site conditions and the amount of BMPs required.

Maintenance

- Sweep and clean parking lots regularly to minimize pollutant transport into storm drains from stormwater runoff.
- Clean out oil/water/sand separators regularly, especially after heavy storms.
- Maintain advanced BMPs such as vegetated swales, infiltration trenches, or detention basins as appropriate. Refer to the treatment control fact sheets for more information.

Supplemental Information

Advanced BMPs

Some parking areas may require advanced BMPs to further reduce pollutants in stormwater runoff, and a few examples are listed below. Refer to the Treatment Control Fact Sheets and the New Development and Redevelopment Manual for more information.

- When possible, direct sheet runoff to flow into biofilters (vegetated strip and swale) and/or infiltration devices.
- Utilize sand filters or oleophilic collectors for oily waste in low quantities.
- Arrange rooftop drains to prevent drainage directly onto paved surfaces.
- Design lot to include semi-permeable hardscape.

References and Resources

City of Seattle, Seattle Public Utilities Department of Planning and Development, 2009. *Stormwater Manual Vol. 1 Source Control Technical Requirements Manual.*

California Stormwater Quality Association, 2003. *New Development and Redevelopment Stormwater Best Management Practice Handbook*. Available online at: https://www.casqa.org/resources/bmp-handbooks/new-development-redevelopment-bmp-handbook.

Kennedy/Jenks Consultants, 2007. *The Truckee Meadows Industrial and Commercial Storm Water Best Management Practices Handbook*. Available online at: http://www.cityofsparks.us/sites/default/files/assets/documents/env-control/construction/TM-I-C_BMP_Handbook_2-07-final.pdf.

Orange County Stormwater Program, Best Management Practices for Industrial/Commercial Business Activities. Available online at: http://ocwatersheds.com/documents/bmp/industrialcommercialbusinessesactivities.

Pollution from Surface Cleaning Folder, 1996, 2003. Bay Area Stormwater Management Agencies Association. Available online at: http://basmaa.org/Portals/0/documents/pdf/Pollution%20from%20Surface%20Cleaning.pdf.

Sacramento Stormwater Management Program. *Best Management Practices for Industrial Storm Water Pollution Control*. Available online at: http://www.msa.saccounty.net/sactostormwater/documents/guides/industrial-BMP-manual.pdf.

The Storm Water Managers Resource Center, http://www.stormwatercenter.net.

US EPA. *Post-Construction Stormwater Management in New Development and Redevelopment*. BMP Fact Sheets. Available online at: http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=min_measure&min_measure_id=5.

Drainage System Maintenance SC-44

Description

As a consequence of its function, the stormwater drainage facilities on site convey stormwater that may contain certain pollutants either to the offsite conveyance system that collects and transports urban runoff and stormwater, or directly to receiving waters. The protocols in this fact sheet are intended to reduce pollutants leaving the site to the offsite drainage infrastructure or to receiving waters through proper on-site conveyance system operation and maintenance. The targeted constituents will vary depending on site characteristics and operations.

Approach

Successful implementation depends on effective training of employees on applicable BMPs and general pollution prevention strategies and objectives.

General Pollution Prevention Protocols

- ☐ Maintain catch basins, stormwater inlets, and other stormwater conveyance structures on a regular basis to remove pollutants, reduce high pollutant concentrations during the first flush of storms, prevent clogging of the downstream conveyance system, restore catch basins' sediment trapping capacity, and ensure the system functions properly hydraulically to avoid flooding.
- ☐ Develop and follow a site specific drainage system maintenance plan that describes maintenance locations, methods, required equipment, water sources, sediment collection areas, disposal requirements, and any other pertinent information.

Good Housekeeping

Illicit Connections and Discharges

- ☐ Look for evidence of illegal discharges or illicit connections during routine maintenance of conveyance system and drainage structures:

Objectives
■ *Cover*
■ *Contain*
■ *Educate*
■ *Reduce/Minimize*

Targeted Constituents	
Sediment	✓
Nutrients	✓
Trash	✓
Metals	✓
Bacteria	✓
Oil and Grease	✓
Organics	✓

Minimum BMPs Covered	
Good Housekeeping	✓
Preventative Maintenance	✓
Spill and Leak Prevention and Response	✓
Material Handling & Waste Management	
Erosion and Sediment Controls	
Employee Training Program	✓
Quality Assurance Record Keeping	✓

CASQA
CALIFORNIA STORMWATER QUALITY ASSOCIATION®

- ✓ Identify evidence of spills such as paints, discoloring, odors, etc.
- ✓ Record locations of apparent illegal discharges/illicit connections.
- ✓ Track flows back to potential discharges and conduct aboveground inspections. This can be done through visual inspection of upgradient manholes or alternate techniques including zinc chloride smoke testing, fluorometric dye testing, physical inspection testing, or television camera inspection.
- ✓ Eliminate the discharge once the origin of flow is established.

- ☐ Stencil or demarcate storm drains, where applicable, to prevent illegal disposal of pollutants. Storm drain inlets should have messages such as "Dump No Waste Drains to Stream" or similar stenciled next to them to warn against ignorant or intentional dumping of pollutants into the storm drainage system.
- ☐ Refer to fact sheet SC-10 Non-Stormwater Discharges for additional information.

Illegal Dumping

- ☐ Inspect and clean up hot spots and other storm drainage areas regularly where illegal dumping and disposal occurs.
- ☐ Establish a system for tracking incidents. The system should be designed to identify the following:
  - ✓ Illegal dumping hot spots;
  - ✓ Types and quantities (in some cases) of wastes;
  - ✓ Patterns in time of occurrence (time of day/night, month, or year);
  - ✓ Mode of dumping (abandoned containers, "midnight dumping" from moving vehicles, direct dumping of materials, accidents/spills); and
  - ✓ Responsible parties.
- ☐ Post "No Dumping" signs in problem areas with a phone number for reporting dumping and disposal. Signs should also indicate fines and penalties for illegal dumping.
- ☐ Refer to fact sheet SC-10 Non-Stormwater Discharges for additional information.

Preventative Maintenance

Catch Basins/Inlet Structures

- ☐ Staff should regularly inspect facilities to ensure compliance with the following:
  - ✓ Immediate repair of any deterioration threatening structural integrity.
  - ✓ Cleaning before the sump is 40% full. Catch basins should be cleaned as frequently as needed to meet this standard.

- Clean catch basins, storm drain inlets, and other conveyance structures before the wet season to remove sediments and debris accumulated during the summer.
- Conduct inspections more frequently during the wet season for problem areas where sediment or trash accumulates more often. Prioritize storm drain inlets; clean and repair as needed.
- Keep accurate logs of the number of catch basins cleaned.
- Store wastes collected from cleaning activities of the drainage system in appropriate containers or temporary storage sites in a manner that prevents discharge to the storm drain.
- Dewater the wastes if necessary with outflow into the sanitary sewer if permitted. Water should be treated with an appropriate filtering device prior to discharge to the sanitary sewer. If discharge to the sanitary sewer is not allowed, water should be pumped or vacuumed to a tank and properly disposed. Do not dewater near a storm drain or stream.

Storm Drain Conveyance System

- Locate reaches of storm drain with deposit problems and develop a flushing schedule that keeps the pipe clear of excessive buildup.
- Collect and pump flushed effluent to the sanitary sewer for treatment whenever possible.

Pump Stations

- Clean all storm drain pump stations prior to the wet season to remove silt and trash.
- Do not allow discharge to reach the storm drain system when cleaning a storm drain pump station or other facility.
- Conduct routine maintenance at each pump station.
- Inspect, clean, and repair as necessary all outlet structures prior to the wet season.

Open Channel

- Modify storm channel characteristics to improve channel hydraulics, increase pollutant removals, and enhance channel/creek aesthetic and habitat value.
- Conduct channel modification/improvement in accordance with existing laws. Any person, government agency, or public utility proposing an activity that will change the natural state of any river, stream, or lake in California, must enter into a Steam or Lake Alteration Agreement with the Department of Fish and Wildlife. The developer-applicant should also contact local governments (city, county, special districts), other state agencies (SWRCB, RWQCB, Department of Forestry, Department of Water Resources), and Army Corps of Engineers and USFWS.

Spill Response and Prevention Procedures

- Keep your spill prevention control plan up-to-date.

- Investigate all reports of spills, leaks, and/or illegal dumping promptly.
- Place a stockpile of spill cleanup materials where it will be readily accessible or at a central location.
- Clean up all spills and leaks using "dry" methods (with absorbent materials and/or rags) or dig up, remove, and properly dispose of contaminated soil.

Employee Training Program

- Educate employees about pollution prevention measures and goals.
- Train employees how to properly handle and dispose of waste using the source control BMPs described above.
- Train employees and subcontractors in proper hazardous waste management.
- Use a training log or similar method to document training.
- Ensure that employees are familiar with the site's spill control plan and/or proper spill cleanup procedures.
- Have staff involved in detection and removal of illicit connections trained in the following:
  - ✓ OSHA-required Health and Safety Training (29 CFR 1910.120) plus annual refresher training (as needed).
  - ✓ OSHA Confined Space Entry training (Cal-OSHA Confined Space, Title 8 and Federal OSHA 29 CFR 1910.146).
  - ✓ Procedural training (field screening, sampling, smoke/dye testing, TV inspection).

Quality Assurance and Record Keeping

- Keep accurate maintenance logs that document minimum BMP activities performed for drainage system maintenance, types and quantities of waste disposed of, and any improvement actions.
- Keep accurate logs of spill response actions that document what was spilled, how it was cleaned up, and how the waste was disposed.
- Keep accurate logs of illicit connections, illicit discharges, and illegal dumping into the storm drain system including how wastes were cleaned up and disposed.
- Establish procedures to complete logs and file them in the central office.

Potential Limitations and Work-Arounds

Provided below are typical limitations and recommended "work-arounds" for drainage system maintenance:

- Clean-up activities may create a slight disturbance for local aquatic species. Access to items and material on private property may be limited. Trade-offs may exist between channel hydraulics and water quality/riparian habitat. If storm channels or basins are recognized as wetlands, many activities, including maintenance, may be subject to regulation and permitting.

  - ✓ Perform all maintenance onsite and do not flush accumulated material downstream to private property or riparian habitats.

- Storm drain flushing is most effective in small diameter pipes (36-inch diameter pipe or less, depending on water supply and sediment collection capacity). Other considerations associated with storm drain flushing may include the availability of a water source, finding a downstream area to collect sediments, and liquid/sediment disposal.

  - ✓ Develop and follow a site specific drainage system maintenance plan that describes maintenance locations, methods, required equipment, water sources, sediment collection areas, disposal requirements, and any other pertinent information.

- Regulations may include adoption of substantial penalties for illegal dumping and disposal.

  - ✓ Do not dump illegal materials anywhere onsite.

  - ✓ Identify illicit connections, illicit discharge, and illegal dumping.

  - ✓ Cleanup spills immediately and properly dispose of wastes.

- Local municipal codes may include sections prohibiting discharge of soil, debris, refuse, hazardous wastes, and other pollutants into the sanitary sewer system.

  - ✓ Collect all materials and pollutants accumulated in drainage system and dispose of according to local regulations.

  - ✓ Install debris excluders in areas with a trash TMDL.

Potential Capital Facility Costs and Operation & Maintenance Requirements

Facilities

- Capital costs will vary substantially depending on the size of the facility and characteristics of the drainage system. Significant capital costs may be associated with purchasing water trucks, vacuum trucks, and any other necessary cleaning equipment or improving the drainage infrastructure to reduce the potential .

- Developing and implementing a site specific drainage system maintenance plan will require additional capital if a similar program is not already in place.

Maintenance

- Two-person teams may be required to clean catch basins with vactor trucks.
- Teams of at least two people plus administrative personnel are required to identify illicit discharges, depending on the complexity of the storm sewer system.
- Arrangements must be made for proper disposal of collected wastes.
- Technical staff are required to detect and investigate illegal dumping violations.
- Methods used for illicit connection detection (smoke testing, dye testing, visual inspection, and flow monitoring) can be costly and time-consuming. Site-specific factors, such as the level of impervious area, the density and ages of buildings, and type of land use will determine the level of investigation necessary.

Supplemental Information

Storm Drain Flushing

Flushing is a common maintenance activity used to improve pipe hydraulics and to remove pollutants in storm drainage systems. Flushing may be designed to hydraulically convey accumulated material to strategic locations, such as an open channel, another point where flushing will be initiated, or the sanitary sewer and the treatment facilities, thus preventing re-suspension and overflow of a portion of the solids during storm events. Flushing prevents "plug flow" discharges of concentrated pollutant loadings and sediments. Deposits can hinder the designed conveyance capacity of the storm drain system and potentially cause backwater conditions in severe cases of clogging.

Storm drain flushing usually takes place along segments of pipe with grades that are too flat to maintain adequate velocity to keep particles in suspension. An upstream manhole is selected to place an inflatable device that temporarily plugs the pipe. Further upstream, water is pumped into the line to create a flushing wave. When the upstream reach of pipe is sufficiently full to cause a flushing wave, the inflated device is rapidly deflated with the assistance of a vacuum pump, thereby releasing the backed up water and resulting in the cleaning of the storm drain segment.

To further reduce impacts of stormwater pollution, a second inflatable device placed well downstream may be used to recollect the water after the force of the flushing wave has dissipated. A pump may then be used to transfer the water and accumulated material to the sanitary sewer for treatment. In some cases, an interceptor structure may be more practical or required to recollect the flushed waters.

It has been found that cleansing efficiency of periodic flush waves is dependent upon flush volume, flush discharge rate, sewer slope, sewer length, sewer flow rate, sewer diameter, and population density. As a rule of thumb, the length of line to be flushed should not exceed 700 feet. At this maximum recommended length, the percent removal efficiency ranges between 65-75% for organics and 55-65% for dry weather grit/inorganic material. The percent removal efficiency drops rapidly beyond that. Water is commonly supplied by a water truck, but fire hydrants can also supply water. To make the best use of water, it is recommended that reclaimed water be used if allowed or that fire hydrant line flushing coincide with storm sewer flushing.

References and Resources

City of Seattle, Seattle Public Utilities Department of Planning and Development, 2009. *Stormwater Manual Vol. 1 Source Control Technical Requirements Manual*.

Knox County Tennessee *Stormwater Management Manual* Chapter 5 Drainage System Maintenance, 2008. Available online at: http://www.knoxcounty.org/stormwater/manual/Volume%201/knoxco_swmm_v1_chap5_jan2008.pdf.

US EPA. Storm Drain System Cleaning, 2012. Available online at: http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=browse&Rbutton=detail&bmp=102.

Efficient Irrigation SD-12

Design Objectives

- ☑ Maximize Infiltration
- ☑ Provide Retention
- ☑ Slow Runoff
- Minimize Impervious Land Coverage
- Prohibit Dumping of Improper Materials
- Contain Pollutants
- Collect and Convey

Description

Irrigation water provided to landscaped areas may result in excess irrigation water being conveyed into stormwater drainage systems.

Approach

Project plan designs for development and redevelopment should include application methods of irrigation water that minimize runoff of excess irrigation water into the stormwater conveyance system.

Suitable Applications

Appropriate applications include residential, commercial and industrial areas planned for development or redevelopment. (Detached residential single-family homes are typically excluded from this requirement.)

Design Considerations

Designing New Installations

The following methods to reduce excessive irrigation runoff should be considered, and incorporated and implemented where determined applicable and feasible by the Permittee:

- Employ rain-triggered shutoff devices to prevent irrigation after precipitation.
- Design irrigation systems to each landscape area's specific water requirements.
- Include design featuring flow reducers or shutoff valves triggered by a pressure drop to control water loss in the event of broken sprinkler heads or lines.
- Implement landscape plans consistent with County or City water conservation resolutions, which may include provision of water sensors, programmable irrigation times (for short cycles), etc.

CASQA
CALIFORNIA STORMWATER QUALITY ASSOCIATION

- Design timing and application methods of irrigation water to minimize the runoff of excess irrigation water into the storm water drainage system.
- Group plants with similar water requirements in order to reduce excess irrigation runoff and promote surface filtration. Choose plants with low irrigation requirements (for example, native or drought tolerant species). Consider design features such as:
  - Using mulches (such as wood chips or bar) in planter areas without ground cover to minimize sediment in runoff
  - Installing appropriate plant materials for the location, in accordance with amount of sunlight and climate, and use native plant materials where possible and/or as recommended by the landscape architect
  - Leaving a vegetative barrier along the property boundary and interior watercourses, to act as a pollutant filter, where appropriate and feasible
  - Choosing plants that minimize or eliminate the use of fertilizer or pesticides to sustain growth
- Employ other comparable, equally effective methods to reduce irrigation water runoff.

Redeveloping Existing Installations

Various jurisdictional stormwater management and mitigation plans (SUSMP, WQMP, etc.) define "redevelopment" in terms of amounts of additional impervious area, increases in gross floor area and/or exterior construction, and land disturbing activities with structural or impervious surfaces. The definition of " redevelopment" must be consulted to determine whether or not the requirements for new development apply to areas intended for redevelopment. If the definition applies, the steps outlined under "designing new installations" above should be followed.

Other Resources

A Manual for the Standard Urban Stormwater Mitigation Plan (SUSMP), Los Angeles County Department of Public Works, May 2002.

Model Standard Urban Storm Water Mitigation Plan (SUSMP) for San Diego County, Port of San Diego, and Cities in San Diego County, February 14, 2002.

Model Water Quality Management Plan (WQMP) for County of Orange, Orange County Flood Control District, and the Incorporated Cities of Orange County, Draft February 2003.

Ventura Countywide Technical Guidance Manual for Stormwater Quality Control Measures, July 2002.

Storm Drain Signage SD-13

Design Objectives

- Maximize Infiltration
- Provide Retention
- Slow Runoff
- Minimize Impervious Land Coverage
- ☑ Prohibit Dumping of Improper Materials
- Contain Pollutants
- Collect and Convey

Description

Waste materials dumped into storm drain inlets can have severe impacts on receiving and ground waters. Posting notices regarding discharge prohibitions at storm drain inlets can prevent waste dumping. Storm drain signs and stencils are highly visible source controls that are typically placed directly adjacent to storm drain inlets.

Approach

The stencil or affixed sign contains a brief statement that prohibits dumping of improper materials into the urban runoff conveyance system. Storm drain messages have become a popular method of alerting the public about the effects of and the prohibitions against waste disposal.

Suitable Applications

Stencils and signs alert the public to the destination of pollutants discharged to the storm drain. Signs are appropriate in residential, commercial, and industrial areas, as well as any other area where contributions or dumping to storm drains is likely.

Design Considerations

Storm drain message markers or placards are recommended at all storm drain inlets within the boundary of a development project. The marker should be placed in clear sight facing toward anyone approaching the inlet from either side. All storm drain inlet locations should be identified on the development site map.

Designing New Installations

The following methods should be considered for inclusion in the project design and show on project plans:

- Provide stenciling or labeling of all storm drain inlets and catch basins, constructed or modified, within the project area with prohibitive language. Examples include “NO DUMPING

CASQA
CALIFORNIA STORMWATER QUALITY ASSOCIATION

– DRAINS TO OCEAN" and/or other graphical icons to discourage illegal dumping.

- Post signs with prohibitive language and/or graphical icons, which prohibit illegal dumping at public access points along channels and creeks within the project area.

Note - Some local agencies have approved specific signage and/or storm drain message placards for use. Consult local agency stormwater staff to determine specific requirements for placard types and methods of application.

Redeveloping Existing Installations

Various jurisdictional stormwater management and mitigation plans (SUSMP, WQMP, etc.) define "redevelopment" in terms of amounts of additional impervious area, increases in gross floor area and/or exterior construction, and land disturbing activities with structural or impervious surfaces. If the project meets the definition of "redevelopment", then the requirements stated under " designing new installations" above should be included in all project design plans.

Additional Information

Maintenance Considerations

- Legibility of markers and signs should be maintained. If required by the agency with jurisdiction over the project, the owner/operator or homeowner's association should enter into a maintenance agreement with the agency or record a deed restriction upon the property title to maintain the legibility of placards or signs.

Placement

- Signage on top of curbs tends to weather and fade.

- Signage on face of curbs tends to be worn by contact with vehicle tires and sweeper brooms.

Supplemental Information

Examples

- Most MS4 programs have storm drain signage programs. Some MS4 programs will provide stencils, or arrange for volunteers to stencil storm drains as part of their outreach program.

Other Resources

A Manual for the Standard Urban Stormwater Mitigation Plan (SUSMP), Los Angeles County Department of Public Works, May 2002.

Model Standard Urban Storm Water Mitigation Plan (SUSMP) for San Diego County, Port of San Diego, and Cities in San Diego County, February 14, 2002.

Model Water Quality Management Plan (WQMP) for County of Orange, Orange County Flood Control District, and the Incorporated Cities of Orange County, Draft February 2003.

Ventura Countywide Technical Guidance Manual for Stormwater Quality Control Measures, July 2002.

Maintenance Bays & Docks SD-31

Design Objectives

- Maximize Infiltration
- Provide Retention
- Slow Runoff
- Minimize Impervious Land Coverage
- ☑ Prohibit Dumping of Improper Materials
- ☑ Contain Pollutants
- Collect and Convey

Description

Several measures can be taken to prevent operations at maintenance bays and loading docks from contributing a variety of toxic compounds, oil and grease, heavy metals, nutrients, suspended solids, and other pollutants to the stormwater conveyance system.

Approach

In designs for maintenance bays and loading docks, containment is encouraged. Preventative measures include overflow containment structures and dead-end sumps. However, in the case of loading docks from grocery stores and warehouse/distribution centers, engineered infiltration systems may be considered.

Suitable Applications

Appropriate applications include commercial and industrial areas planned for development or redevelopment.

Design Considerations

Design requirements for vehicle maintenance and repair are governed by Building and Fire Codes, and by current local agency ordinances, and zoning requirements. The design criteria described in this fact sheet are meant to enhance and be consistent with these code requirements.

Designing New Installations

Designs of maintenance bays should consider the following:

- Repair/maintenance bays and vehicle parts with fluids should be indoors; or designed to preclude urban run-on and runoff.
- Repair/maintenance floor areas should be paved with Portland cement concrete (or equivalent smooth impervious surface).

CASQA
CALIFORNIA STORMWATER QUALITY ASSOCIATION

- Repair/maintenance bays should be designed to capture all wash water leaks and spills. Provide impermeable berms, drop inlets, trench catch basins, or overflow containment structures around repair bays to prevent spilled materials and wash-down waters form entering the storm drain system. Connect drains to a sump for collection and disposal. Direct connection of the repair/maintenance bays to the storm drain system is prohibited. If required by local jurisdiction, obtain an Industrial Waste Discharge Permit.

- Other features may be comparable and equally effective.

The following designs of loading/unloading dock areas should be considered:

- Loading dock areas should be covered, or drainage should be designed to preclude urban run-on and runoff.

- Direct connections into storm drains from depressed loading docks (truck wells) are prohibited.

- Below-grade loading docks from grocery stores and warehouse/distribution centers of fresh food items should drain through water quality inlets, or to an engineered infiltration system, or an equally effective alternative. Pre-treatment may also be required.

- Other features may be comparable and equally effective.

Redeveloping Existing Installations

Various jurisdictional stormwater management and mitigation plans (SUSMP, WQMP, etc.) define "redevelopment" in terms of amounts of additional impervious area, increases in gross floor area and/or exterior construction, and land disturbing activities with structural or impervious surfaces. The definition of " redevelopment" must be consulted to determine whether or not the requirements for new development apply to areas intended for redevelopment. If the definition applies, the steps outlined under "designing new installations" above should be followed.

Additional Information

Stormwater and non-stormwater will accumulate in containment areas and sumps with impervious surfaces. Contaminated accumulated water must be disposed of in accordance with applicable laws and cannot be discharged directly to the storm drain or sanitary sewer system without the appropriate permit.

Other Resources

A Manual for the Standard Urban Stormwater Mitigation Plan (SUSMP), Los Angeles County Department of Public Works, May 2002.

Model Standard Urban Storm Water Mitigation Plan (SUSMP) for San Diego County, Port of San Diego, and Cities in San Diego County, February 14, 2002.

Model Water Quality Management Plan (WQMP) for County of Orange, Orange County Flood Control District, and the Incorporated Cities of Orange County, Draft February 2003.

Ventura Countywide Technical Guidance Manual for Stormwater Quality Control Measures, July 2002.

Trash Storage Areas SD-32

Description

Trash storage areas are areas where a trash receptacle (s) are located for use as a repository for solid wastes. Stormwater runoff from areas where trash is stored or disposed of can be polluted. In addition, loose trash and debris can be easily transported by water or wind into nearby storm drain inlets, channels, and/or creeks. Waste handling operations that may be sources of stormwater pollution include dumpsters, litter control, and waste piles.

Approach

This fact sheet contains details on the specific measures required to prevent or reduce pollutants in stormwater runoff associated with trash storage and handling. Preventative measures including enclosures, containment structures, and impervious pavements to mitigate spills, should be used to reduce the likelihood of contamination.

Design Objectives

- Maximize Infiltration
- Provide Retention
- Slow Runoff
- Minimize Impervious Land Coverage
- Prohibit Dumping of Improper Materials
- ☑ Contain Pollutants
- Collect and Convey

Suitable Applications

Appropriate applications include residential, commercial and industrial areas planned for development or redevelopment. (Detached residential single-family homes are typically excluded from this requirement.)

Design Considerations

Design requirements for waste handling areas are governed by Building and Fire Codes, and by current local agency ordinances and zoning requirements. The design criteria described in this fact sheet are meant to enhance and be consistent with these code and ordinance requirements. Hazardous waste should be handled in accordance with legal requirements established in Title 22, California Code of Regulation.

Wastes from commercial and industrial sites are typically hauled by either public or commercial carriers that may have design or access requirements for waste storage areas. The design criteria in this fact sheet are recommendations and are not intended to be in conflict with requirements established by the waste hauler. The waste hauler should be contacted prior to the design of your site trash collection areas. Conflicts or issues should be discussed with the local agency.

Designing New Installations

Trash storage areas should be designed to consider the following structural or treatment control BMPs:

- Design trash container areas so that drainage from adjoining roofs and pavement is diverted around the area(s) to avoid run-on. This might include berming or grading the waste handling area to prevent run-on of stormwater.
- Make sure trash container areas are screened or walled to prevent off-site transport of trash.

CASQA
CALIFORNIA STORMWATER QUALITY ASSOCIATION

- Use lined bins or dumpsters to reduce leaking of liquid waste.
- Provide roofs, awnings, or attached lids on all trash containers to minimize direct precipitation and prevent rainfall from entering containers.
- Pave trash storage areas with an impervious surface to mitigate spills.
- Do not locate storm drains in immediate vicinity of the trash storage area.
- Post signs on all dumpsters informing users that hazardous materials are not to be disposed of therein.

Redeveloping Existing Installations

Various jurisdictional stormwater management and mitigation plans (SUSMP, WQMP, etc.) define "redevelopment" in terms of amounts of additional impervious area, increases in gross floor area and/or exterior construction, and land disturbing activities with structural or impervious surfaces. The definition of " redevelopment" must be consulted to determine whether or not the requirements for new development apply to areas intended for redevelopment. If the definition applies, the steps outlined under "designing new installations" above should be followed.

Additional Information

Maintenance Considerations

The integrity of structural elements that are subject to damage (i.e., screens, covers, and signs) must be maintained by the owner/operator. Maintenance agreements between the local agency and the owner/operator may be required. Some agencies will require maintenance deed restrictions to be recorded of the property title. If required by the local agency, maintenance agreements or deed restrictions must be executed by the owner/operator before improvement plans are approved.

Other Resources

A Manual for the Standard Urban Stormwater Mitigation Plan (SUSMP), Los Angeles County Department of Public Works, May 2002.

Model Standard Urban Storm Water Mitigation Plan (SUSMP) for San Diego County, Port of San Diego, and Cities in San Diego County, February 14, 2002.

Model Water Quality Management Plan (WQMP) for County of Orange, Orange County Flood Control District, and the Incorporated Cities of Orange County, Draft February 2003.

Ventura Countywide Technical Guidance Manual for Stormwater Quality Control Measures, July 2002.

APPENDIX F

Infiltration Feasibility

June 12, 2023

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

Pacific Industrial
6272 East Pacific Coast Highway, Suite E
Long Beach, California 90803

Attention: Mr. Bo Prock
Acquisitions Manager

Project No.: **23G157-2**

Subject: **Storm Water Infiltration**
Proposed Industrial Building
17969 Railroad Street
Industry, California

Reference: Geotechnical Investigation, Proposed Industrial Building, 17969 Railroad Street, City of Industry, California, prepared for Pacific Industrial, by Southern California Geotechnical, Inc. (SCG), SCG Project No. 23G157-1.

Mr. Prock:

In accordance with your request, we are providing this letter to document the geotechnical conditions related to potential storm water infiltration at the subject site.

We recently conducted a geotechnical investigation at the subject site, referenced above. The soil conditions encountered at the boring locations generally consist of fill soils comprised of silty clays and clayey silts expending to depths of up to 6½± feet. The underlying native alluvium consists of clayey silts and silty sands. The encountered soils, particularly the fill materials, are expected to possess very poor infiltration characteristics. In addition, the fill soils have been heavily disturbed, further reducing their potential infiltration rates. Finally, the site is located within a liquefaction hazard zone, and some of the on-site soils have been determined to be susceptible to liquefaction during a large seismic event. The use of storm water infiltration could increase the potential for, and magnitude of, liquefaction-induced settlements.

For the reasons stated above, storm water infiltration is not considered feasible and is not recommended for this project.

We appreciate the opportunity to be of continued service on this project. If we may be of further assistance in any manner, please contact our office at your convenience.

Respectfully Submitted,

SOUTHERN CALIFORNIA GEOTECHNICAL, INC.

Daryl Kas, CEG 2467
Senior Geologist

Gregory K. Mitchell, GE 2364
Principal Engineer

Distribution: (1) Addressee

September 30, 2020

Bill Huff
Reuland Electric
17969 Railroad Street
City of Industry, CA 91748-1192

SUBJECT: RESPONSE TO EXTENSION REQUEST TO SUBMIT A WORKPLAN PURSUANT TO CALIFORNIA WATER CODE SECTION 13267 ORDER WQ-2019-0045-DWQ

SITE: REULAND ELECTRIC COMPANY 17969 EAST RAILRAOD STREET, CITY OF INDUSTRY, CALIFORNIA (FILE NUMBER: 105.0238; SITE ID NUMBER: 2040157)

Dear Mr. Huff:

The Regional Water Quality Control Board, Los Angeles Region (Regional Board) is the public agency with primary responsibility for the protection of ground and surface water quality within Los Angeles and Ventura counties, including the property located at 17969 Railroad Street, in the City of Industry, California (the Site).

The Regional Board has received and reviewed the *Extension Request for the per- and polyfluoroalkyl (PFAS) Investigation Workplan,* dated August 28, 2020 (Extension Request) for the Site. The Extension Request in response to a State Board 13267 Order Number WQ-2019-0045-DWQ for PFAS Investigation (Order), issued on October 25, 2019.

REQUEST FOR EXTENSION

The Order requires you to assess the lateral and vertical extent of possible PFAS contamination beneath the Site and submit a Workplan to the Regional Board by August 31, 2020.

In the Extension Request, you request that the deadline to submit the Workplan to the Regional Board be extended to September 30, 2020 to allow for additional research to prepare an adequate workplan to address the potential PFAS impacts at the Site.

After reviewing your request, the additional information, and file documents for the Site, the Regional Board approves the extension from August 31, 2020 to **September 30, 2020** to submit the required Workplan.

If you have any questions regarding this matter, please contact me via telephone at (213) 576-6783 or via email at errick.llamas@waterboards.ca.gov or Jeffrey Hu (Unit Chief) via telephone at (213) 576-6803 or via email at jeffrey.hu@waterboards.ca.gov.

Sincerely,

Errick Llamas

Enclosures: *Extension Request for the per- and polyfluoroalkyl (PFAS) Investigation Workplan,* dated August 28, 2020

cc: Steve Dickey, Dudek

April 10, 2016

Robert Toms
Gibson, Rivera & Toms, LLC
527 South Lake Ave #105
Pasadena, CA 91101

Subject: 2016 Groundwater Monitoring and Sampling Report, Reuland Electric Company, 17969 Railroad Street, City of Industry

Dear Mr. Toms:

This report presents data gathered in the follow-up groundwater monitoring event requested by the Los Angeles Regional Water Quality Control Board. The last monitoring event was conducted by Vapor Extraction Technologies on August 22, 2011 (Vapor Extraction Technology report dated September 23, 2011). The monitoring work reported here consisted of the following:

1. Conduct assessment of present condition of monitoring wells. This task included locating the wells, taking depth to groundwater measurements, and sounding depth to bottom of the wells. The assessment was completed on December 10, 2015.
2. Conduct a groundwater sampling event for volatile compounds with lab analysis by 8260B.
3. Update the 2011 report and compare current to previous data.

To the extent possible, site figures and tables from the previous report were scanned, modified, and updated to complete this report.

Monitor Well Assessment

Figure 1 shows the Reuland Electric facitilies; The map summarizes previous environmental assessment and remedial work related to solvent impacted soil and groundwater. Some details of the map are poorly legible, and additional maps are utilized to better show locations of the twelve Reuland groundwater monitoring wells, of which eleven remain.

On December 10 2015, field work was conducted at the site by Stephen Dickey and Christian Hunter of Dudek to evaluate the wells. All wells were located except MW-10, which was destroyed in 2009 when its portion of the facility was disked with a tractor to clear weeds. All remaining wells were found to be viable for monitoring water table elevation and also for water sampling. Table 1 summarizes the results of the well condition assessment. The only obstruction found in the assessment was a thick ball of tree roots located at the water table in Well MW-9; this was fished out with a weighted hook and the well was bailed clean of debris on December 10.

As a precaution, the wells were investigated in an order determined by previous Reuland sampling data from "cleanest" to most impacted by groundwater VOCs. The well sounder and tag weight assembly were decontaminated in an Alconox wash and triple rinsed with deionized water between wells to prevent cross contamination.

Figure 2 shows the groundwater elevation measurements taken by VET on August 22, 2011 and by Dudek on December 10, 2015. The 2015 groundwater levels are almost uniformly two feet deeper than 2011 levels reflecting the effect of prolonged Southern California drought conditions. Groundwater flow direction and gradient remain relatively unchanged, with flow direction in the shallow zone approximately northwest, as shown on Figure 2 (note that north is to the right of the figure, and not "up" due to the shape of the facility).

Groundwater Sampling

Condition of the monitoring wells was reported to the Water Board which responded with a list of Reuland Electric wells to sample. The list consists of Wells MW-1, MW-3, MW-8, MW-9, MW-11, and MW-12. These wells had VOC detections in the August 2011 sampling event, and the remaining wells were reported "ND" for VOCs by Sierra Analytical and Test America labs in 2011.

The six selected water wells were purged and sampled on January 13, 2016 by Christian Hunter and Steve Dickey. Purging was accomplished with a stainless steel bailer equipped with a Teflon check valve. The bailer and water level sounding equipment were decontaminated between wells with an Alconox wash and triple rinse with dionized water. Water samples were taken with disposable bailers, each well requiring a dedicated unused clean disposable bailer. The wells were sampled in the order of "cleanest" to most impacted based on previous data.

Split water samples drawn from the disposable bailers were taken and submitted for Method 8260B analysis in lab supplied 40 ml VOA containers to Sierra Analytical Labs, and Test America Laboratories under chain of custody procedures. Both labs are located in Irvine, CA.

Additional samples were submitted to each laboratory consisting of a lab-supplied trip blank, and also a duplicate sample taken from well MW-8.

Groundwater Sampling Results

The complete lab analytical reports generated by Test America Laboratories and Sierra Analytical Labs are provided in Appendix A of this document.

The 2016 analyses are summarized in the following table:

Summary of Lab Reports, 8260B, January 13, 2016 Sampling Event
Reuland Electric, 17969 Railroad Street, City of Industry

Well No.	Test America, PCE	Test America, TCE	Sierra Analytical, PCE	Sierra Analytical, TCE
	ug/L	ug/L	ug/L	ug/L
MW-1	4.4	ND	3.2	ND
MW-3	8.5	ND	7.3	ND
MW-8	11.0	ND	9**	22**
MW-8 Dupe	11.0	ND	10.0	ND
MW-9	11.0	ND	8.5	ND
MW-11	33.0	0.95	26.0	ND
MW-12	8.0	ND	6.3	ND
Trip Blank	ND	ND	ND	ND

**NOTE: The Sierra Analytical MW-8 analysis had detections for ethylbenzene; trichloroethene; m,p-xylene, and o-xylene, which were not detected in the Sierra Analytical MW-8 Dupe or in the Test America MW-8 and MW-8 Dupe samples. Therefore the anomalous detections may have been instrument carry-over from another project's samples; in addition instrument analysis times for this entire batch of samples are 13:36, and should be sequential times logged by the GC autoloader, suggesting a lab QA issue

Figure 3 provides the PCE lab results for 2011 and 2016 on the site facility map for comparison. In four years PCE concentrations have significantly reduced in wells MW-1, MW-3, MW-8, MW-9, and MW-12. PCE concentration has increased at MW-11 from 19 to 33 ug/L.

Agreement as regards VOC concentration is reasonably consistent between the Sierra Analytical and the Test America reports. However, Sierra Analytical's report for sample MW-8 contains additional detections for compounds not previously detected at the Reuland site; in addition this sample report lists a significant concentration for TCE at 22 ug/L, which is anomalous compared

to previous sample events and also anomalous compared to the reports for three other samples of MW-8 water taken January 13 and analyzed in this event.

In all, four VOA samples were analyzed from the January 13 event for well MW-8; two samples for each lab including an MW-8 and an MW-8 Duplicate 40ml container were submitted and analyzed. Because only one of the four MW-8 sample analyses reported detections for ethylbenzene, mp-xylene, o-xylene, and elevated trichloroethene it is concluded that these detections are anomalous and related to a Sierra Analytical lab QA issue that occurred during their analysis of this batch of samples.

Table 2 provides an updated spreadsheet of the entire historical groundwater elevation and VOC groundwater sampling record for the Reuland Electric monitor wells.

Conclusions

This monitoring event at Reuland Electric measured shallow groundwater levels that are generally two feet lower in 2015 than measured in 2011 due to drought conditions. 2016 VOC sampling of wells selected by the Los Angeles Regional Water Quality Control Board indicates a gradual reduction in PCE concentrations, except at monitor well MW-11, which has increased.

As discussed in previous reports by Vapor Extraction Technology, the PCE detection at well MW-8 is substantially outside and east of the groundwater flow pathline passing through the Reulands manufacturing area (Figure 2).

Please call me at 760 450-6870 if you have questions regarding this report.

Sincerely,

_____

Stephen K. Dickey, CEG, CHG
Senior Hydrogeologist
Dudek
3544 University Ave.
Riverside, CA 92501

Attachments:
Table1, Monitor Well Reconnaissance, Reuland Electric December 10, 2015
Table 2, Historical Groundwater Monitoring Data, Reuland Electric
Figure 1, Rueland Electric Facility
Figure 2, Groundwater Elevations
Figure 3, PCE in Groundwater
Appendix A, Sierra Analytical Labs and Test America Laboratories Reports, January 13, 2016 Water Samples

TABLE 1

Monitor Well Reconnaissance, Reuland Electric , December 10, 2015

Well	TOC Depth Below Pavement, Feet, 12/10/15	Depth to Bottom of Well, Feet Below TOC, 12/10/15	Depth to Water, Feet Below TOC, 8/22/11	Depth to Water, Feet Below TOC, 12/10/15	Feet of Water Above Bottom of Well, 12/10/15	Casing Top Elev, Ft; Surveyed Oct 1999 by OKO Engineering, NAVD88	Groundwater Elevation, 8/22/11	Groundwater Elevation, 12/10/15	Groundwater Elevation Change, 2011 to 2015
MW-1		35.2	17.37	19.37	15.8	423.61	406.24	404.24	-2.00
MW-2	0.28		15.03	17.22		422.33	407.30	405.11	-2.19
MW-3	0.68	32.4	17.55	19.56	12.8	423.04	405.49	403.48	-2.01
MW-4	0.56	30.6	16.81	18.8	11.8	423.08	406.27	404.28	-1.99
MW-5	0.53	34.5	19.58	21.63	12.9	425.98	406.40	404.35	-2.05
MW-6	0.23	35.1	15.83	18.07	17.0	423.71	407.88	405.64	-2.24
MW-7	0.40	34.0	17.61	19.68	14.3	424.36	406.75	404.68	-2.07
MW-8	0.46	33.2	14.6	16.66	16.5	421.01	406.41	404.35	-2.06
MW-9	0.47	35.9	16.9	18.89	17.0	423.01	406.11	404.12	-1.99
MW-10	Well destroyed 2009								
MW-11	0.42	32.2	17.72	19.76	12.4	423.54	405.82	403.78	-2.04
MW-12	0.48	31.95	18.19	20.23	11.7	424.17	405.98	403.94	-2.04

NOTE: TOC abbreviation for "Top of Casing"

TABLE 2
HISTORICAL GROUNDWATER MONITORING DATA

Reuland Electric
17969 East Railroad Street, City of Industry, CA
Updated with 12/10/15 Groundwater Level Measurements by S. K. Dickey, Dudek
Updated With 1/13/16 Groundwater Sampling Event Data by S. K. Dickey, Dudek

WELL ID	SAMPLE DATE	DATUM ELEVATION	DEPTH TO GW	GW ELEVATION	1,1-DCE	1,2-DCA	1,1,1-TCA	c-1,2-DCE	t-1,2-DCE	PCE	TCE	FREON	REFERENCE
		(feet MSL)	(feet TOC)	(feet MSL)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	
MW-1	02/13/89	421.50	19.46	402.04	ND	ND	ND	ND	ND	12000	200	ND	Block/QI, 10/25/96
MW-1	03/15/89	421.50	na	na	ND	ND	ND	ND	13	540	12	ND	Block/QI, 10/25/96
MW-1	10/06/89	421.50	20.14	401.36	ND	ND	ND	ND	ND	280	7.4	ND	Block/QI, 10/25/96
MW-1	11/22/89	421.50	20.34	401.16	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-1	12/12/89	421.50	20.25	401.25	ND	ND	ND	ND	ND	140	ND	ND	Block/QI, 10/25/96
MW-1	01/26/90	421.50	19.95	401.55	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-1	02/09/90	421.50	20.04	401.46	ND	ND	ND	ND	ND	180	ND	ND	Block/QI, 10/25/96
MW-1	03/16/90	421.50	19.54	401.96	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-1	04/30/90	421.50	19.70	401.80	ND	ND	ND	ND	ND	36	ND	ND	Block/QI, 10/25/96
MW-1	06/04/90	421.50	19.68	401.82	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-1	07/13/90	421.50	19.86	401.64	ND	ND	ND	ND	ND	88	ND	ND	Block/QI, 10/25/96
MW-1	08/24/90	421.50	19.98	401.52	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-1	09/21/90	421.50	19.99	401.51	ND	ND	ND	ND	ND	320	ND	ND	Block/QI, 10/25/96
MW-1	11/08/90	421.50	20.27	401.23	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-1	11/27/90	421.50	20.34	401.16	ND	ND	ND	ND	ND	80	ND	ND	Block/QI, 10/25/96
MW-1	01/09/91	421.50	19.99	401.51	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-1	01/22/91	421.50	20.02	401.48	ND	ND	ND	ND	ND	740	ND	ND	Block/QI, 10/25/96
MW-1	02/19/91	421.50	20.37	401.13	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-1	04/01/91	421.50	18.73	402.77	ND	ND	ND	ND	ND	5700	ND	ND	Block/QI, 10/25/96
MW-1	04/24/91	421.50	19.20	402.30	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-1	06/05/91	421.50	19.48	402.02	ND	ND	ND	ND	ND	140	ND	ND	Block/QI, 10/25/96
MW-1	08/21/91	421.50	19.66	401.84	ND	ND	ND	6	ND	170	ND	ND	Block/QI, 10/25/96
MW-1	09/24/91	421.50	19.68	401.82	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-1	10/03/91	421.50	19.65	401.85	ND	ND	ND	2	ND	52	1	ND	Block/QI, 10/25/96
MW-1	11/05/91	421.50	19.98	401.52	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-1	12/11/91	421.50	19.82	401.68	ND	ND	ND	4.3	ND	240	3.7	ND	Block/QI, 10/25/96
MW-1	01/07/92	421.50	17.78	403.72	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-1	02/05/92	421.50	18.51	402.99	ND	ND	ND	ND	ND	340	ND	ND	Block/QI, 10/25/96
MW-1	03/06/92	421.50	17.80	403.70	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-1	04/02/92	421.50	17.43	404.07	ND	ND	ND	ND	ND	58	0.5	ND	QI, 10/25/96
MW-1	05/07/92	421.50	18.02	403.48	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-1	06/02/92	421.50	18.31	403.19	ND	ND	ND	ND	ND	54	ND	ND	Block/QI, 10/25/96
MW-1	07/13/92	421.50	18.57	402.93	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-1	08/04/92	421.50	18.64	402.86	ND	ND	ND	ND	ND	230	ND	ND	Block/QI, 10/25/96
MW-1	09/03/92	421.50	18.88	402.62	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-1	10/08/92	421.50	18.94	402.56	ND	ND	ND	ND	ND	100	ND	ND	Block/QI, 10/25/96
MW-1	11/16/92	421.50	18.92	402.58	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-1	12/03/92	421.50	19.08	402.42	ND	ND	ND	ND	ND	88	ND	ND	Block/QI, 10/25/96
MW-1	01/05/93	421.50	18.39	403.11	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-1	02/01/93	421.50	16.41	405.09	ND	ND	ND	ND	ND	31	ND	ND	Block/QI, 10/25/96

TABLE 2
HISTORICAL GROUNDWATER MONITORING DATA

Reuland Electric
17969 East Railroad Street, City of Industry, CA
Updated with 12/10/15 Groundwater Level Measurements by S. K. Dickey, Dudek
Updated With 1/13/16 Groundwater Sampling Event Data by S. K. Dickey, Dudek

WELL ID	SAMPLE DATE	DATUM ELEVATION	DEPTH TO GW	GW ELEVATION	1,1-DCE	1,2-DCA	1,1,1-TCA	c-1,2-DCE	t-1,2-DCE	PCE	TCE	FREON	REFERENCE
		(feet MSL)	(feet TOC)	(feet MSL)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	
MW-1	03/03/93	421.50	15.71	405.79	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-1	04/01/93	421.50	15.89	405.61	ND	ND	ND	1.6	ND	22	ND	ND	Block/QI, 10/25/96
MW-1	05/05/93	421.50	16.53	404.97	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-1	06/04/93	421.50	16.92	404.58	ND	ND	ND	2.4	ND	66	1.3	ND	Block/QI, 10/25/96
MW-1	07/02/93	421.50	17.13	404.37	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-1	08/04/93	421.50	17.50	404.00	ND	ND	ND	7.4	ND	69	2.7	ND	Block/QI, 10/25/96
MW-1	09/07/93	421.50	17.83	403.67	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-1	10/06/93	421.50	17.98	403.52	ND	ND	ND	1.2	ND	20	0.58	ND	Block/QI, 10/25/96
MW-1	11/01/93	421.50	18.10	403.40	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-1	12/13/93	421.50	18.26	403.24	ND	ND	ND	1.7	ND	26	0.87	ND	Block/QI, 10/25/96
MW-1	01/03/94	421.50	18.29	403.21	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-1	02/02/94	421.50	18.40	403.10	ND	ND	ND	4.0	ND	83	3.2	ND	Block/QI, 10/25/96
MW-1	03/01/94	421.50	18.15	403.35	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-1	04/08/94	421.50	18.18	403.32	ND	ND	ND	9.3	ND	98	5.3	ND	Block/QI, 10/25/96
MW-1	05/05/94	421.50	18.34	403.16	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-1	06/08/94	421.50	18.60	402.90	ND	ND	ND	5.7	ND	80	2.8	ND	Block/QI, 10/25/96
MW-1	07/05/94	421.50	18.73	402.77	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-1	08/04/94	421.50	18.84	402.66	ND	ND	ND	4.8	ND	300	3.9	ND	Block/QI, 10/25/96
MW-1	09/09/94	421.50	19.01	402.49	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-1	10/03/94	421.50	18.98	402.52	ND	ND	ND	8.8	ND	76	3.7	ND	Block/QI, 10/25/96
MW-1	11/01/94	421.50	19.12	402.38	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-1	12/07/94	421.50	19.22	402.28	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-1	01/04/95	421.50	19.04	402.46	ND	ND	ND	4.6	ND	39	1.6	ND	Block/QI, 10/25/96
MW-1	02/01/95	421.50	17.59	403.91	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-1	03/15/95	421.50	16.77	404.73	ND	ND	ND	15	ND	110	4.5	ND	Block/QI, 10/25/96
MW-1	07/21/95	421.50	17.55	403.95	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-1	07/17/96	421.50	18.50	403.00	ND	ND	ND	ND	ND	26	ND	ND	Block/QI, 10/25/96
MW-1	10/14/96	421.50	18.85	402.65	ND	ND	ND	11	ND	98	4.0	ND	Block/QI, 10/25/96
MW-1	04/16/97	421.50	18.05	403.45	ND	ND	ND	ND	ND	33.1	ND	ND	Block, 3/3/99
MW-1	12/23/97	421.50	18.65	402.85	ND	ND	ND	ND	ND	54.5	ND	ND	Block, 3/3/99
MW-1	07/10/98	421.50	16.80	404.70	ND	ND	ND	ND	2.3	74.7	ND	ND	Block, 3/3/99
MW-1	01/22/99	421.50	17.95	403.55	ND	ND	ND	ND	0.7	31.2	ND	ND	Block, 3/3/99
MW-1	10/08/99	423.61	18.70	404.91	ND<0.5	ND<0.5	ND<0.5	NA	ND<0.5	21	2.7	ND<0.5	VET
MW-1	11/02/99	423.61	18.71	404.90	na	na	na	na	na	na	na	na	VET
MW-1	05/10/00	423.61	18.05	405.56	ND<0.5	ND<0.5	ND<0.5	na	ND<0.5	16	ND<0.5	ND<0.5	VET
MW-1	06/28/00	423.61	na	na	ND<0.5	ND<0.5	ND<0.5	na	ND<0.5	19	ND<0.5	na	VET
MW-1	08/01/00	423.61	na	na	ND<0.5	ND<0.5	ND<0.5	na	ND<0.5	14	ND<0.5	na	VET
MW-1	10/30/00	423.61	18.81	404.80	ND<0.5	ND<0.5	ND<0.5	na	ND<0.5	26	ND<0.5	na	VET
MW-1	12/07/00	423.61	18.82	404.79	ND<0.5	ND<0.5	ND<0.5	na	ND<0.5	15	ND<0.5	na	VET
MW-1	12/29/00	423.61	na	na	ND<0.5	ND<0.5	ND<0.5	na	ND<0.5	15	ND<0.5	na	VET
MW-1	03/24/03	423.61	na	na	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	66	ND<0.5	na	VET

TABLE 2
HISTORICAL GROUNDWATER MONITORING DATA

Reuland Electric
17969 East Railroad Street, City of Industry, CA
Updated with 12/10/15 Groundwater Level Measurements by S. K. Dickey, Dudek
Updated With 1/13/16 Groundwater Sampling Event Data by S. K. Dickey, Dudek

WELL ID	SAMPLE DATE	DATUM ELEVATION	DEPTH TO GW	GW ELEVATION	1,1-DCE	1,2-DCA	1,1,1-TCA	c-1,2-DCE	t-1,2-DCE	PCE	TCE	FREON	REFERENCE
		(feet MSL)	(feet TOC)	(feet MSL)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	
MW-1	04/04/03	423.61	na	na	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	5.6	ND<0.5	na	VET
MW-1	04/14/03	423.61	na	na	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	30	ND<0.5	na	VET
MW-1	07/11/03	423.61	na	na	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	0.87	ND<0.5	ND<0.5	VET
MW-1	02/02/01	423.61	18.74	404.87	ND<0.5	ND<0.5	ND<0.5	na	ND<0.5	15	ND<0.5	ND<0.5	VET
MW-1	11/20/05	423.61	17.35	406.26	ND<0.5	ND<0.5	ND<0.5	na	ND<0.5	260	ND<0.5	ND<0.5	VET
MW-1	08/29/06	423.61	18.00	405.61	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	42	ND<1.0	ND<1.0	VET
MW-1	08/18/07	423.61	18.85	404.76	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	53	ND<1.0	ND<1.0	VET
MW-1	07/30/08	423.61	18.75	404.86	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	17	ND<1.0	ND<1.0	VET
MW-1	10/16/09	423.61	19.05	404.56	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	26	ND<1.0	ND<1.0	VET
MW-1	08/19/10	423.61	18.18	405.43	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	11	ND<1.0	ND<1.0	VET
MW-1	08/22/11	423.61	17.37	406.24	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	6.6	ND<1.0	ND<1.0	VET
MW-1	12/10/15	423.61	19.37	404.24									Dudek
MW-1	01/13/16				ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	4.4	ND<1.0	ND<1.0	Dudek
MW-2	02/13/89	420.15	17.31	402.84	ND	ND	0.1	ND	ND	4.9	ND	1.2	Block/QI, 10/25/96
MW-2	03/15/89	420.15	na	na	ND	ND	1.2	ND	ND	6.8	ND	ND	Block/QI, 10/25/96
MW-2	10/06/89	420.15	17.93	402.22	1.3	0.7	4.2	ND	ND	4.9	ND	ND	Block/QI, 10/25/96
MW-2	11/22/89	420.15	18.07	402.08	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-2	12/12/89	420.15	18.13	402.02	6.6	ND	9	ND	ND	7.1	ND	ND	Block/QI, 10/25/96
MW-2	01/26/90	420.15	17.75	402.40	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-2	02/09/90	420.15	17.85	402.30	4.3	ND	20	ND	ND	8.5	ND	ND	Block/QI, 10/25/96
MW-2	03/16/90	420.15	17.42	402.73	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-2	04/30/90	420.15	17.51	402.64	6.4	ND	10	ND	ND	4.9	ND	ND	Block/QI, 10/25/96
MW-2	06/04/90	420.15	17.45	402.70	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-2	07/13/90	420.15	17.68	402.47	ND	ND	24	ND	ND	8.5	ND	ND	Block/QI, 10/25/96
MW-2	08/24/90	420.15	17.75	402.40	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-2	09/21/90	420.15	17.72	402.43	8.6	1.8	12	ND	ND	4.5	ND	ND	Block/QI, 10/25/96
MW-2	11/08/90	420.15	18.22	401.93	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-2	11/27/90	420.15	18.22	401.93	12	1.9	14	ND	ND	5	ND	ND	Block/QI, 10/25/96
MW-2	01/09/91	420.15	17.93	402.22	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-2	01/22/91	420.15	17.97	402.18	8.6	ND	8.9	ND	ND	3.5	ND	ND	Block/QI, 10/25/96
MW-2	02/19/91	420.15	18.37	401.78	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-2	04/01/91	420.15	16.58	403.57	9.3	ND	8.7	ND	ND	4.7	ND	ND	Block/QI, 10/25/96
MW-2	04/24/91	420.15	17.08	403.07	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-2	06/05/91	420.15	17.38	402.77	10	ND	6.5	ND	ND	3	ND	ND	Block/QI, 10/25/96
MW-2	08/21/91	420.15	17.54	402.61	30	ND	16	ND	ND	5	ND	ND	Block/QI, 10/25/96
MW-2	09/24/91	420.15	17.56	402.59	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-2	10/03/91	420.15	17.58	402.57	40	ND	23	ND	ND	9	ND	ND	Block/QI, 10/25/96
MW-2	11/05/91	420.15	17.95	402.20	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-2	12/11/91	420.15	17.82	402.33	45	ND	20	ND	ND	8.1	ND	ND	Block/QI, 10/25/96
MW-2	01/07/92	420.15	15.58	404.57	na	na	na	na	na	na	na	na	QI, 10/25/96

TABLE 2
HISTORICAL GROUNDWATER MONITORING DATA

Reuland Electric
17969 East Railroad Street, City of Industry, CA
Updated with 12/10/15 Groundwater Level Measurements by S. K. Dickey, Dudek
Updated With 1/13/16 Groundwater Sampling Event Data by S. K. Dickey, Dudek

WELL ID	SAMPLE DATE	DATUM ELEVATION	DEPTH TO GW	GW ELEVATION	1,1-DCE	1,2-DCA	1,1,1-TCA	c-1,2-DCE	t-1,2-DCE	PCE	TCE	FREON	REFERENCE
		(feet MSL)	(feet TOC)	(feet MSL)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	
MW-2	02/05/92	420.15	16.56	403.59	45	ND	17	ND	ND	6	ND	ND	Block/QI, 10/25/96
MW-2	03/06/92	420.15	15.71	404.44	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-2	04/02/92	420.15	15.31	404.84	34	ND	12	ND	ND	4.1	ND	ND	QI, 10/25/96
MW-2	05/07/92	420.15	15.95	404.20	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-2	06/02/92	420.15	16.20	403.95	63	ND	19	ND	ND	6	ND	ND	Block/QI, 10/25/96
MW-2	07/13/92	420.15	16.45	403.70	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-2	08/04/92	420.15	16.55	403.60	46	ND	17	ND	ND	6.6	ND	ND	Block/QI, 10/25/96
MW-2	09/03/92	420.15	16.74	403.41	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-2	10/08/92	420.15	16.84	403.31	45	ND	9.2	ND	ND	4.6	ND	ND	Block/QI, 10/25/96
MW-2	11/16/92	420.15	16.84	403.31	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-2	12/03/92	420.15	17.02	403.13	58	ND	8.4	ND	ND	9.2	ND	ND	Block/QI, 10/25/96
MW-2	01/05/93	420.15	16.30	403.85	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-2	02/01/93	420.15	14.27	405.88	81	ND	11	ND	ND	2.5	ND	ND	Block/QI, 10/25/96
MW-2	03/03/93	420.15	13.41	406.74	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-2	04/01/93	420.15	13.69	406.46	120	ND	16	ND	ND	3.4	ND	ND	Block/QI, 10/25/96
MW-2	05/05/93	420.15	14.32	405.83	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-2	06/04/93	420.15	14.75	405.40	110	ND	13	ND	ND	5.4	ND	ND	Block/QI, 10/25/96
MW-2	07/02/93	420.15	14.98	405.17	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-2	08/04/93	420.15	15.37	404.78	130	ND	13	ND	ND	2.9	ND	ND	Block/QI, 10/25/96
MW-2	09/07/93	420.15	15.64	404.51	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-2	10/06/93	420.15	15.84	404.31	95	ND	9.4	ND	ND	3.6	ND	ND	Block/QI, 10/25/96
MW-2	11/01/93	420.15	15.96	404.19	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-2	12/13/93	420.15	16.09	404.06	92	ND	8.5	ND	ND	4.4	ND	ND	Block/QI, 10/25/96
MW-2	01/03/94	420.15	16.17	403.98	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-2	02/02/94	420.15	16.28	403.87	94	ND	8.9	ND	ND	5.3	ND	ND	Block/QI, 10/25/96
MW-2	03/01/94	420.15	15.98	404.17	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-2	04/08/94	420.15	16.03	404.12	150	ND	12	ND	ND	5.5	ND	ND	Block/QI, 10/25/96
MW-2	05/05/94	420.15	16.22	403.93	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-2	06/08/94	420.15	16.45	403.70	190	ND	23	ND	ND	4.6	ND	ND	Block/QI, 10/25/96
MW-2	07/05/94	420.15	16.59	403.56	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-2	08/04/94	420.15	16.72	403.43	230	ND	11	ND	ND	2.7	ND	ND	Block/QI, 10/25/96
MW-2	09/09/94	420.15	16.87	403.28	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-2	10/03/94	420.15	16.84	403.31	240	ND	16	ND	ND	4.5	0.85	ND	Block/QI, 10/25/96
MW-2	11/01/94	420.15	16.99	403.16	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-2	12/07/94	420.15	17.09	403.06	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-2	01/04/95	420.15	17.00	403.15	270	ND	14	ND	ND	4.3	0.76	ND	Block/QI, 10/25/96
MW-2	02/01/95	420.15	15.42	404.73	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-2	03/15/95	420.15	14.33	405.82	310	ND	12	ND	ND	2.5	0.78	ND	Block/QI, 10/25/96
MW-2	07/21/95	420.15	15.37	404.78	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-2	07/17/96	420.15	16.32	403.83	150	ND	0.9	ND	ND	5.8	ND	ND	Block/QI, 10/25/96
MW-2	10/14/96	420.15	16.71	403.44	140	ND	2.7	ND	ND	1.3	0.52	ND	Block/QI, 10/25/96

TABLE 2
HISTORICAL GROUNDWATER MONITORING DATA

Reuland Electric
17969 East Railroad Street, City of Industry, CA
Updated with 12/10/15 Groundwater Level Measurements by S. K. Dickey, Dudek
Updated With 1/13/16 Groundwater Sampling Event Data by S. K. Dickey, Dudek

WELL ID	SAMPLE DATE	DATUM ELEVATION	DEPTH TO GW	GW ELEVATION	1,1-DCE	1,2-DCA	1,1,1-TCA	c-1,2-DCE	t-1,2-DCE	PCE	TCE	FREON	REFERENCE
		(feet MSL)	(feet TOC)	(feet MSL)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	
MW-2	04/16/97	420.15	15.80	404.35	ND	ND	1.9	ND	ND	1.8	ND	ND	Block, 3/3/99
MW-2	12/23/97	420.15	16.30	403.85	95.3	ND	ND	ND	ND	1.3	ND	ND	Block, 3/3/99
MW-2	07/10/98	420.15	14.54	405.61	171.7	ND	ND	ND	ND	1.3	ND	ND	Block, 3/3/99
MW-2	01/22/99	420.15	15.75	404.40	42.5	ND	ND	ND	ND	1.9	ND	ND	Block, 3/3/99
MW-2	10/08/99	422.33	16.58	405.75	19	ND<0.5	ND<0.5	NA	ND<0.5	ND<0.5	ND<0.5	ND<0.5	VET
MW-2	11/02/99	422.33	16.58	405.75	na	na	na	na	na	na	na	na	VET
MW-2	05/10/00	422.33	16.10	406.23	110	ND<0.5	0.82	na	ND<0.5	3.0	ND<0.5	ND<0.5	VET
MW-2	04/04/03	422.33	na	na	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	na	VET
MW-2	04/14/03	422.33	na	na	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	na	VET
MW-2	07/11/03	422.33	na	na	18	ND<0.5	ND<0.5	ND<0.5	ND<0.5	0.7	ND<0.5	ND<0.5	VET
MW-2	02/01/01	422.33	16.65	405.68	83	ND<0.5	ND<0.5	na	ND<0.5	1.7	ND<0.5	ND<0.5	VET
MW-2	11/20/05	422.33	15.15	407.18	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	VET
MW-2	08/29/06	422.33	15.64	406.69	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	VET
MW-2	08/18/07	422.33	16.67	405.66	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	VET
MW-2	07/30/08	422.33	16.47	405.86	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	VET
MW-2	10/16/09	422.33	16.82	405.51	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	VET
MW-2	08/19/10	422.33	15.88	406.45	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	VET
MW-2	08/22/11	422.33	15.03	407.30	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	VET
MW-2	12/10/15	422.33	17.22	405.11									Dudek
MW-3	02/13/89	420.95	19.58	401.37	ND	ND	ND	ND	ND	3900	100	ND	Block/QI, 10/25/96
MW-3	03/15/89	420.95	na	na	ND	ND	ND	ND	ND	490	80	ND	Block/QI, 10/25/96
MW-3	10/06/89	420.95	20.38	400.57	ND	ND	ND	64	ND	310	53	ND	Block/QI, 10/25/96
MW-3	11/22/89	420.95	20.56	400.39	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-3	12/12/89	420.95	20.56	400.39	ND	ND	ND	66	ND	310	41	ND	Block/QI, 10/25/96
MW-3	01/26/90	420.95	20.25	400.70	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-3	02/09/90	420.95	20.28	400.67	ND	ND	ND	34	ND	150	31	ND	Block/QI, 10/25/96
MW-3	03/16/90	420.95	19.91	401.04	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-3	04/30/90	420.95	20.03	400.92	ND	ND	ND	55	ND	120	31	ND	Block/QI, 10/25/96
MW-3	06/04/90	420.95	19.91	401.04	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-3	07/13/90	420.95	20.10	400.85	ND	ND	ND	61	ND	230	50	ND	Block/QI, 10/25/96
MW-3	08/24/90	420.95	20.20	400.75	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-3	09/21/90	420.95	20.25	400.70	ND	ND	ND	71	ND	300	51	ND	Block/QI, 10/25/96
MW-3	11/08/90	420.95	20.63	400.32	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-3	11/27/90	420.95	20.72	400.23	ND	ND	ND	75	ND	230	44	ND	Block/QI, 10/25/96
MW-3	01/09/91	420.95	20.26	400.69	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-3	01/22/91	420.95	20.32	400.63	ND	ND	ND	51	ND	190	35	ND	Block/QI, 10/25/96
MW-3	02/19/91	420.95	20.74	400.21	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-3	04/01/91	420.95	18.78	402.17	ND	ND	ND	77	ND	290	42	ND	Block/QI, 10/25/96
MW-3	04/24/91	420.95	19.23	401.72	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-3	06/05/91	420.95	19.65	401.30	ND	ND	ND	150	ND	470	60	ND	Block/QI, 10/25/96

TABLE 2
HISTORICAL GROUNDWATER MONITORING DATA

Reuland Electric
17969 East Railroad Street, City of Industry, CA
Updated with 12/10/15 Groundwater Level Measurements by S. K. Dickey, Dudek
Updated With 1/13/16 Groundwater Sampling Event Data by S. K. Dickey, Dudek

WELL ID	SAMPLE DATE	DATUM ELEVATION	DEPTH TO GW	GW ELEVATION	1,1-DCE	1,2-DCA	1,1,1-TCA	c-1,2-DCE	t-1,2-DCE	PCE	TCE	FREON	REFERENCE
		(feet MSL)	(feet TOC)	(feet MSL)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	
MW-3	08/21/91	420.95	20.00	400.95	ND	ND	ND	160	ND	490	66	ND	Block/QI, 10/25/96
MW-3	09/24/91	420.95	19.97	400.98	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-3	10/03/91	420.95	19.92	401.03	ND	ND	ND	95	ND	340	43	ND	Block/QI, 10/25/96
MW-3	11/05/91	420.95	20.30	400.65	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-3	12/11/91	420.95	20.08	400.87	ND	ND	ND	65	ND	210	31	ND	Block/QI, 10/25/96
MW-3	01/07/92	420.95	17.34	403.61	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-3	02/05/92	420.95	18.14	402.81	ND	ND	ND	ND	ND	240	23	ND	Block/QI, 10/25/96
MW-3	03/06/92	420.95	17.91	403.04	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-3	04/02/92	420.95	17.49	403.46	ND	ND	ND	ND	ND	640	59	ND	QI, 10/25/96
MW-3	05/07/92	420.95	18.34	402.61	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-3	06/02/92	420.95	18.56	402.39	ND	ND	ND	ND	ND	770	43	ND	Block/QI, 10/25/96
MW-3	07/13/92	420.95	18.87	402.08	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-3	08/04/92	420.95	18.96	401.99	ND	ND	ND	ND	ND	780	23	ND	Block/QI, 10/25/96
MW-3	09/03/92	420.95	19.12	401.83	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-3	10/08/92	420.95	19.24	401.71	ND	ND	ND	ND	ND	700	34	ND	Block/QI, 10/25/96
MW-3	11/16/92	420.95	19.24	401.71	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-3	12/03/92	420.95	19.37	401.58	ND	ND	ND	ND	ND	570	ND	ND	Block/QI, 10/25/96
MW-3	01/05/93	420.95	18.59	402.36	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-3	02/01/93	420.95	16.57	404.38	na	na	na	na	na	na	na	na	Block/QI, 10/25/96
MW-3	03/03/93	420.95	15.85	405.10	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-3	04/01/93	420.95	16.21	404.74	ND	ND	ND	99	ND	600	41	ND	Block/QI, 10/25/96
MW-3	05/05/93	420.95	16.86	404.09	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-3	06/04/93	420.95	17.30	403.65	ND	ND	ND	250	ND	1600	73	ND	Block/QI, 10/25/96
MW-3	07/02/93	420.95	17.48	403.47	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-3	08/04/93	420.95	17.69	403.26	ND	ND	ND	170	ND	1000	31	ND	Block/QI, 10/25/96
MW-3	09/07/93	420.95	18.11	402.84	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-3	10/06/93	420.95	18.30	402.65	ND	ND	ND	210	ND	2000	66	ND	Block/QI, 10/25/96
MW-3	11/01/93	420.95	18.41	402.54	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-3	12/13/93	420.95	18.51	402.44	ND	ND	ND	120	ND	1300	39	ND	Block/QI, 10/25/96
MW-3	01/03/94	420.95	18.61	402.34	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-3	02/02/94	420.95	18.69	402.26	ND	ND	ND	110	0.64	1200	59	ND	Block/QI, 10/25/96
MW-3	03/01/94	420.95	18.45	402.50	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-3	04/08/94	420.95	18.45	402.50	ND	ND	ND	190	ND	1500	59	ND	Block/QI, 10/25/96
MW-3	05/05/94	420.95	18.65	402.30	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-3	06/08/94	420.95	18.89	402.06	ND	ND	ND	230	0.71	1200	48	ND	Block/QI, 10/25/96
MW-3	07/05/94	420.95	19.05	401.90	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-3	08/04/94	420.95	19.18	401.77	ND	ND	ND	180	ND	1000	41	ND	Block/QI, 10/25/96
MW-3	09/09/94	420.95	19.30	401.65	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-3	10/03/94	420.95	19.23	401.72	1.2	ND	ND	130	0.53	560	31	ND	Block/QI, 10/25/96
MW-3	11/01/94	420.95	19.42	401.53	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-3	12/07/94	420.95	19.51	401.44	na	na	na	na	na	na	na	na	QI, 10/25/96

TABLE 2
HISTORICAL GROUNDWATER MONITORING DATA

Reuland Electric
17969 East Railroad Street, City of Industry, CA
Updated with 12/10/15 Groundwater Level Measurements by S. K. Dickey, Dudek
Updated With 1/13/16 Groundwater Sampling Event Data by S. K. Dickey, Dudek

WELL ID	SAMPLE DATE	DATUM ELEVATION	DEPTH TO GW	GW ELEVATION	1,1-DCE	1,2-DCA	1,1,1-TCA	c-1,2-DCE	t-1,2-DCE	PCE	TCE	FREON	REFERENCE
		(feet MSL)	(feet TOC)	(feet MSL)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	
MW-3	01/04/95	420.95	19.33	401.62	1.0	ND	ND	110	ND	490	25	ND	Block/QI, 10/25/96
MW-3	02/01/95	420.95	17.84	403.11	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-3	03/15/95	420.95	16.75	404.20	ND	ND	ND	36	ND	170	73	ND	Block/QI, 10/25/96
MW-3	07/21/95	420.95	17.86	403.09	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-3	07/17/96	420.95	18.79	402.16	ND	ND	ND	84	ND	220	23	ND	Block/QI, 10/25/96
MW-3	10/14/96	420.95	19.16	401.79	ND	ND	ND	56	ND	110	11	ND	Block/QI, 10/25/96
MW-3	04/16/97	420.95	18.28	402.67	ND	ND	ND	ND	ND	347.4	15	ND	Block, 3/3/99
MW-3	12/23/97	420.95	19.72	401.23	ND	ND	ND	ND	34.5	202.7	5.8	ND	Block, 3/3/99
MW-3	07/10/98	420.95	17.02	403.93	ND	ND	ND	ND	58.1	472.5	7.2	ND	Block, 3/3/99
MW-3	7/10/98 (d)	na	na	na	ND	ND	ND	ND	63.4	517.7	7.8	ND	Block, 3/3/99
MW-3	01/22/99	420.95	18.25	402.70	ND	ND	ND	ND	76.2	526.9	11.3	ND	Block, 3/3/99
MW-3	10/08/99	423.04	18.98	404.06	ND<0.5	ND<0.5	ND<0.5	NA	ND<0.5	280	5.2	ND<0.5	VET
MW-3	11/02/99	423.04	19.02	404.02	na	na	na	na	na	na	na	na	VET
MW-3	05/10/00	423.04	18.53	404.51	ND<0.5	ND<0.5	ND<0.5	na	ND<0.5	370	9.2	ND<0.5	VET
MW-3	10/31/00	423.04	19.01	404.03	ND<0.5	ND<0.5	ND<0.5	na	ND<0.5	320	7.5	ND<0.5	VET
MW-3	12/07/00	423.04	19.08	403.96	ND<0.5	ND<0.5	ND<0.5	na	ND<0.5	190	7.7	ND<0.5	VET
MW-3	12/29/00	423.04	na	na	ND<0.5	ND<0.5	ND<0.5	na	ND<0.5	500	5.7	ND<0.5	VET
MW-3	02/02/01	423.04	19.07	403.97	ND<0.5	ND<0.5	ND<0.5	na	ND<0.5	52	0.85	ND<0.5	VET
MW-3-1	05/03/01	423.04	na	na	ND<0.5	ND<0.5	ND<0.5	na	ND<0.5	45	0.70	ND<0.5	VET
MW-3-2	05/03/01	423.04	na	na	ND<0.5	ND<0.5	ND<0.5	na	ND<0.5	23	3.9	ND<0.5	VET
MW-3	08/10/01	423.04	na	na	ND<0.5	ND<0.5	ND<0.5	1.5	ND<0.5	30	0.60	ND<0.5	VET
MW-3-1	08/22/01	423.04	na	na	ND<0.5	ND<0.5	ND<0.5	1.6	ND<0.5	32	0.71	ND<0.5	VET
MW-3	08/24/01	423.04	18.71	404.33	ND<0.5	ND<0.5	ND<0.5	1.2	ND<0.5	19	ND<0.5	ND<0.5	VET
MW-3	09/18/01	423.04	na	na	ND<0.5	ND<0.5	ND<0.5	1.1	ND<0.5	27	0.58	ND<0.5	VET
MW-3	10/26/01	423.04	na	na	ND<0.5	ND<0.5	ND<0.5	1.9	ND<0.5	25	0.88	ND<0.5	VET
MW-3	11/29/01	423.04	na	na	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	12	ND<0.50	ND<0.50	VET
MW-3	08/24/01	423.04	na	na	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	34	ND<0.50	na	VET
MW-3	09/18/01	423.04	na	na	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	1.3	ND<0.50	na	VET
MW-3	10/26/01	423.04	na	na	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	1.6	ND<0.50	na	VET
MW-3	11/29/01	423.04	na	na	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	1.8	ND<0.50	ND<0.50	VET
MW-3	11/20/05	423.04	17.60	405.44	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	18	ND<0.50	ND<0.50	VET
MW-3	08/29/06	423.04	18.17	404.87	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	38	ND<1.0	ND<1.0	VET
MW-3	08/18/07	423.04	DRY	<404.64	-----	-----	-----	-----	-----	-----	-----	-----	VET
MW-3	08/03/08	423.04	18.91	404.13	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	27	ND<1.0	ND<1.0	VET
MW-3	10/16/09	422.03	19.21	402.82	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	72	ND<1.0	ND<1.0	VET
MW-3	08/19/10	423.04	18.35	404.69	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	22	ND<1.0	ND<1.0	VET
MW-3	08/22/11	423.04	17.55	405.49	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	19	ND<1.0	ND<1.0	VET
MW-3	12/10/15	423.04	19.56	403.48									Dudek
MW-3	01/13/16				ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	8.5	ND<1.0	ND<1.0	Dudek
MW-4	02/13/89	420.90	19.48	401.42	ND	ND	ND	ND	ND	1400	ND	ND	Block/QI, 10/25/96

TABLE 2
HISTORICAL GROUNDWATER MONITORING DATA

Reuland Electric
17969 East Railroad Street, City of Industry, CA
Updated with 12/10/15 Groundwater Level Measurements by S. K. Dickey, Dudek
Updated With 1/13/16 Groundwater Sampling Event Data by S. K. Dickey, Dudek

WELL ID	SAMPLE DATE	DATUM ELEVATION	DEPTH TO GW	GW ELEVATION	1,1-DCE	1,2-DCA	1,1,1-TCA	c-1,2-DCE	t-1,2-DCE	PCE	TCE	FREON	REFERENCE
		(feet MSL)	(feet TOC)	(feet MSL)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	
MW-4	03/15/89	420.90	na	na	ND	ND	ND	ND	ND	22	ND	ND	Block/QI, 10/25/96
MW-4	10/06/89	420.90	20.02	400.88	ND	ND	ND	ND	ND	21	0.7	ND	Block/QI, 10/25/96
MW-4	11/22/89	420.90	20.22	400.68	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-4	12/12/89	420.90	20.25	400.65	0.3	ND	ND	ND	ND	17	0.6	ND	Block/QI, 10/25/96
MW-4	01/26/90	420.90	19.89	401.01	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-4	02/09/90	420.90	19.95	400.95	ND	ND	ND	ND	ND	19	0.5	ND	Block/QI, 10/25/96
MW-4	03/16/90	420.90	19.51	401.39	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-4	04/30/90	420.90	19.67	401.23	ND	ND	ND	ND	ND	13	ND	ND	Block/QI, 10/25/96
MW-4	06/04/90	420.90	19.55	401.35	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-4	07/13/90	420.90	19.75	401.15	ND	ND	ND	ND	ND	23	ND	ND	Block/QI, 10/25/96
MW-4	08/24/90	420.90	19.85	401.05	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-4	09/21/90	420.90	19.87	401.03	ND	ND	ND	ND	ND	22	ND	ND	Block/QI, 10/25/96
MW-4	11/08/90	420.90	20.39	400.51	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-4	11/27/90	420.90	20.38	400.52	ND	ND	ND	ND	ND	22	ND	ND	Block/QI, 10/25/96
MW-4	01/09/91	420.90	19.97	400.93	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-4	01/22/91	420.90	20.06	400.84	ND	ND	ND	ND	ND	68	ND	ND	Block/QI, 10/25/96
MW-4	02/19/91	420.90	20.48	400.42	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-4	04/01/91	420.90	18.58	402.32	ND	ND	ND	6.6	ND	40	2.5	ND	Block/QI, 10/25/96
MW-4	04/24/91	420.90	19.42	401.48	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-4	06/05/91	420.90	19.44	401.46	ND	ND	ND	ND	ND	12	ND	ND	Block/QI, 10/25/96
MW-4	08/21/91	420.90	19.74	401.16	ND	ND	ND	ND	ND	16	ND	ND	Block/QI, 10/25/96
MW-4	09/24/91	420.90	19.70	401.20	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-4	10/03/91	420.90	19.69	401.21	ND	ND	ND	ND	ND	19	ND	ND	Block/QI, 10/25/96
MW-4	11/05/91	420.90	20.22	400.68	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-4	12/11/91	420.90	19.91	400.99	ND	ND	ND	ND	ND	18	ND	ND	Block/QI, 10/25/96
MW-4	01/07/92	420.90	16.41	404.49	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-4	02/05/92	420.90	18.60	402.30	ND	ND	ND	ND	ND	21	ND	ND	Block/QI, 10/25/96
MW-4	03/06/92	420.90	17.73	403.17	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-4	04/02/92	420.90	17.42	403.48	ND	ND	3	ND	ND	22	ND	ND	QI, 10/25/96
MW-4	05/07/92	420.90	18.17	402.73	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-4	06/02/92	420.90	18.38	402.52	ND	ND	ND	ND	ND	23	ND	ND	Block/QI, 10/25/96
MW-4	07/13/92	420.90	18.69	402.21	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-4	08/04/92	420.90	18.79	402.11	ND	ND	ND	ND	ND	16	ND	ND	Block/QI, 10/25/96
MW-4	09/03/92	420.90	18.95	401.95	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-4	10/08/92	420.90	19.01	401.89	ND	ND	ND	ND	ND	21	ND	ND	Block/QI, 10/25/96
MW-4	11/16/92	420.90	19.05	401.85	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-4	12/03/92	420.90	19.21	401.69	ND	ND	ND	ND	ND	19	ND	ND	Block/QI, 10/25/96
MW-4	01/05/93	420.90	18.38	402.52	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-4	02/01/93	420.90	16.52	404.38	ND	ND	ND	ND	ND	18	ND	ND	Block/QI, 10/25/96
MW-4	03/03/93	420.90	15.74	405.16	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-4	04/01/93	420.90	16.01	404.89	ND	ND	ND	ND	ND	17	ND	ND	Block/QI, 10/25/96

TABLE 2
HISTORICAL GROUNDWATER MONITORING DATA

Reuland Electric
17969 East Railroad Street, City of Industry, CA
Updated with 12/10/15 Groundwater Level Measurements by S. K. Dickey, Dudek
Updated With 1/13/16 Groundwater Sampling Event Data by S. K. Dickey, Dudek

WELL ID	SAMPLE DATE	DATUM ELEVATION	DEPTH TO GW	GW ELEVATION	1,1-DCE	1,2-DCA	1,1,1-TCA	c-1,2-DCE	t-1,2-DCE	PCE	TCE	FREON	REFERENCE
		(feet MSL)	(feet TOC)	(feet MSL)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	
MW-4	05/05/93	420.90	16.72	404.18	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-4	06/04/93	420.90	17.10	403.80	ND	ND	ND	ND	ND	20	ND	ND	Block/QI, 10/25/96
MW-4	07/02/93	420.90	17.32	403.58	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-4	08/04/93	420.90	17.88	403.02	ND	ND	ND	ND	ND	29	ND	ND	Block/QI, 10/25/96
MW-4	09/07/93	420.90	17.95	402.95	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-4	10/06/93	420.90	18.14	402.76	ND	ND	ND	ND	ND	30	ND	ND	Block/QI, 10/25/96
MW-4	11/01/93	420.90	18.26	402.64	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-4	12/13/93	420.90	18.35	402.55	ND	ND	ND	ND	ND	37	ND	ND	Block/QI, 10/25/96
MW-4	01/03/94	420.90	18.43	402.47	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-4	02/02/94	420.90	18.52	402.38	ND	ND	ND	ND	ND	41	ND	ND	Block/QI, 10/25/96
MW-4	03/01/94	420.90	18.23	402.67	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-4	04/08/94	420.90	18.28	402.62	ND	ND	ND	ND	ND	51	ND	ND	Block/QI, 10/25/96
MW-4	05/05/94	420.90	18.45	402.45	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-4	06/08/94	420.90	18.73	402.17	ND	0.95	ND	ND	ND	40	ND	ND	Block/QI, 10/25/96
MW-4	07/05/94	420.90	18.83	402.07	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-4	08/04/94	420.90	18.98	401.92	ND	ND	ND	ND	ND	44	ND	ND	Block/QI, 10/25/96
MW-4	09/09/94	420.90	19.10	401.80	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-4	10/03/94	420.90	18.95	401.95	ND	ND	ND	ND	ND	41	ND	ND	Block/QI, 10/25/96
MW-4	11/01/94	420.90	19.22	401.68	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-4	12/07/94	420.90	19.31	401.59	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-4	01/04/95	420.90	19.11	401.79	ND	ND	ND	ND	ND	39	ND	ND	Block/QI, 10/25/96
MW-4	02/01/95	420.90	17.60	403.30	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-4	03/15/95	420.90	16.53	404.37	ND	ND	ND	ND	ND	17	ND	ND	Block/QI, 10/25/96
MW-4	07/21/95	420.90	17.71	403.19	na	na	na	na	na	na	na	na	QI, 10/25/96
MW-4	07/17/96	420.90	18.60	402.30	ND	ND	ND	ND	ND	32	ND	ND	Block/QI, 10/25/96
MW-4	10/14/96	420.90	18.95	401.95	ND	ND	ND	ND	ND	30	ND	ND	Block/QI, 10/25/96
MW-4	04/16/97	420.90	18.14	402.76	ND	ND	ND	ND	ND	18.1	ND	ND	Block, 3/3/99
MW-4	12/23/97	420.90	18.15	402.75	ND	ND	ND	ND	ND	23.6	ND	ND	Block, 3/3/99
MW-4	07/10/98	420.90	16.91	403.99	ND	ND	ND	ND	ND	34.3	ND	ND	Block, 3/3/99
MW-4	01/22/99	420.90	18.09	402.81	ND	ND	ND	ND	ND	45.4	ND	ND	Block, 3/3/99
MW-4	10/08/99	423.08	18.80	404.28	ND<0.5	ND<0.5	ND<0.5	na	ND<0.5	32	ND<0.5	ND<0.5	VET
MW-4	11/02/99	423.08	18.83	404.25	na	na	na	na	na	na	na	na	VET
MW-4	05/10/00	423.08	18.35	404.73	ND<0.5	ND<0.5	ND<0.5	na	ND<0.5	39	ND<0.5	ND<0.5	VET
MW-4	10/31/00	423.08	18.81	404.27	ND<0.5	ND<0.5	ND<0.5	na	ND<0.5	34	ND<0.5	ND<0.5	VET
MW-4	12/07/00	423.08	18.87	404.21	ND<0.5	ND<0.5	ND<0.5	na	ND<0.5	37	ND<0.5	ND<0.5	VET
MW-4	12/29/00	423.08	na	na	ND<0.5	ND<0.5	ND<0.5	na	ND<0.5	12	ND<0.5	ND<0.5	VET
MW-4	03/24/03	423.08	na	na	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	12	ND<0.5	na	VET
MW-4	04/04/03	423.08	na	na	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	na	VET
MW-4	04/14/03	423.08	na	na	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	na	VET
MW-4	07/11/03	423.08	na	na	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	2.1	ND<0.5	ND<0.5	VET
MW-4	02/02/01	423.08	18.82	404.26	1.0	ND<0.5	ND<0.5	na	ND<0.5	23	ND<0.5	ND<0.5	VET

TABLE 2
HISTORICAL GROUNDWATER MONITORING DATA

Reuland Electric
17969 East Railroad Street, City of Industry, CA
Updated with 12/10/15 Groundwater Level Measurements by S. K. Dickey, Dudek
Updated With 1/13/16 Groundwater Sampling Event Data by S. K. Dickey, Dudek

WELL ID	SAMPLE DATE	DATUM ELEVATION	DEPTH TO GW	GW ELEVATION	1,1-DCE	1,2-DCA	1,1,1-TCA	c-1,2-DCE	t-1,2-DCE	PCE	TCE	FREON	REFERENCE
		(feet MSL)	(feet TOC)	(feet MSL)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	
MW-4	11/20/05	423.08	16.99	406.09	2.2	ND<0.5	ND<0.5	na	ND<0.5	14	ND<0.5	ND<0.5	VET
MW-4	08/29/06	423.08	17.41	405.67	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	8.1	ND<1.0	ND<1.0	VET
MW-4	08/18/07	423.08	18.38	404.70	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	16	ND<1.0	ND<1.0	VET
MW-4	07/30/08	423.08	18.20	404.88	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	6.6	ND<1.0	ND<1.0	VET
MW-4	10/16/09	423.08	18.5	404.58	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	4.8	ND<1.0	ND<1.0	VET
MW-4	08/19/10	423.08	17.61	405.47	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	1.7	ND<1.0	ND<1.0	VET
MW-4	08/22/11	423.08	16.81	406.27	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	VET
MW-4	12/10/15	423.08	18.8	404.28									Dudek
MW-5	10/08/99	425.98	21.16	404.82	ND<0.5	ND<0.5	ND<0.5	na	ND<0.5	ND<0.5	ND<0.5	ND<0.5	VET
MW-5	11/02/99	425.98	21.18	404.80	na	na	na	na	na	na	na	na	VET
MW-5	05/10/00	425.98	20.68	405.30	ND<0.5	ND<0.5	ND<0.5	na	ND<0.5	0.67	ND<0.5	ND<0.5	VET
MW-5	04/04/03	425.98	na	na	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	0.66	ND<0.5	na	VET
MW-5	04/14/03	425.98	na	na	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	na	VET
MW-5	07/11/03	425.98	na	na	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	VET
MW-5	02/01/01	425.98	21.22	404.76	ND<0.5	ND<0.5	ND<0.5	na	ND<0.5	0.82	ND<0.5	ND<0.5	VET
MW-5	11/20/05	425.98	19.71	406.27	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	VET
MW-5	08/29/06	425.98	20.19	405.79	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	VET
MW-5	08/18/07	425.98	21.21	404.77	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	VET
MW-5	07/30/08	425.98	20.99	404.99	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	VET
MW-5	10/16/09	425.98	21.28	404.70	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	VET
MW-5	08/19/10	425.98	20.40	405.58	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	VET
MW-5	08/22/11	425.98	19.58	406.40	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	VET
MW-5	12/10/15	425.98	21.63	404.35									Dudek
MW-6	10/08/99	423.71	17.44	406.27	ND<0.5	ND<0.5	ND<0.5	na	ND<0.5	ND<0.5	ND<0.5	ND<0.5	VET
MW-6	11/02/99	423.71	17.38	406.33	na	na	na	na	na	na	na	na	VET
MW-6	05/10/00	423.71	16.90	406.81	ND<0.5	ND<0.5	ND<0.5	na	ND<0.5	0.51	ND<0.5	ND<0.5	VET
MW-6	02/01/01	423.71	17.45	406.26	ND<0.5	ND<0.5	ND<0.5	na	ND<0.5	ND<0.5	ND<0.5	ND<0.5	VET
MW-6	04/04/03	423.71	na	na	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	na	VET
MW-6	04/14/03	423.71	na	na	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	na	VET
MW-6	07/11/03	423.71	na	na	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	VET
MW-6	11/20/05	423.71	15.89	407.82	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	VET
MW-6	08/29/06	423.71	16.41	407.30	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	VET
MW-6	08/18/07	423.71	17.48	406.23	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	VET
MW-6	07/30/08	423.71	17.28	406.43	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	VET
MW-6	10/16/09	423.71	17.68	406.03	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	VET
MW-6	08/19/10	423.71	16.68	407.03	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	VET
MW-6	08/22/11	423.71	15.83	407.88	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	VET
MW-6	12/10/15	423.71	18.07	405.64									Dudek

TABLE 2
HISTORICAL GROUNDWATER MONITORING DATA

Reuland Electric
17969 East Railroad Street, City of Industry, CA
Updated with 12/10/15 Groundwater Level Measurements by S. K. Dickey, Dudek
Updated With 1/13/16 Groundwater Sampling Event Data by S. K. Dickey, Dudek

WELL ID	SAMPLE DATE	DATUM ELEVATION	DEPTH TO GW	GW ELEVATION	1,1-DCE	1,2-DCA	1,1,1-TCA	c-1,2-DCE	t-1,2-DCE	PCE	TCE	FREON	REFERENCE
		(feet MSL)	(feet TOC)	(feet MSL)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	
MW-7	10/08/99	424.36	22.50	401.86	ND<0.5	ND<0.5	ND<0.5	na	ND<0.5	ND<0.5	ND<0.5	ND<0.5	VET
MW-7	11/02/99	424.36	19.17	405.19	na	na	na	na	na	na	na	na	VET
MW-7	05/10/00	424.36	18.68	405.68	ND<0.5	ND<0.5	ND<0.5	na	ND<0.5	ND<0.5	ND<0.5	ND<0.5	VET
MW-7	02/01/01	424.36	19.22	405.14	ND<0.5	ND<0.5	ND<0.5	na	ND<0.5	ND<0.5	ND<0.5	ND<0.5	VET
MW-7	04/04/03	424.36	na	na	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	na	VET
MW-7	04/14/03	424.36	na	na	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	na	VET
MW-7	07/11/03	424.36	na	na	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	VET
MW-7	11/20/05	424.36	17.71	406.65	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	VET
MW-7	08/29/06	424.36	18.20	406.16	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	VET
MW-7	08/18/07	424.36	19.21	405.15	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	VET
MW-7	07/30/08	424.36	19.02	405.34	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	VET
MW-7	10/16/09	424.36	19.32	405.04	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	VET
MW-7	08/19/10	424.36	16.68	407.68	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	VET
MW-7	08/22/11	424.36	17.61	406.75	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	VET
MW-7	12/10/15	424.36	19.68	404.68									Dudek
MW-8	10/08/99	421.01	16.08	404.93	ND<0.5	ND<0.5	ND<0.5	na	ND<0.5	12	ND<0.5	ND<0.5	VET
MW-8	11/02/99	421.01	16.14	404.87	na	na	na	na	na	na	na	na	VET
MW-8	05/10/00	421.01	15.75	405.26	ND<0.5	ND<0.5	ND<0.5	na	ND<0.5	26	ND<0.5	ND<0.5	VET
MW-8	02/02/01	421.01	16.16	404.85	ND<0.5	ND<0.5	ND<0.5	na	ND<0.5	14	ND<0.5	ND<0.5	VET
MW-8	04/04/03	421.01	na	na	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	31	ND<0.5	na	VET
MW-8	04/14/03	421.01	na	na	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	7.3	ND<0.5	na	VET
MW-8	07/11/03	421.01	na	na	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	9.2	ND<0.5	ND<0.5	VET
MW-8	11/20/05	421.01	14.71	406.30	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	25	ND<0.5	ND<0.5	VET
MW-8	08/29/06	421.01	15.21	405.80	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	16	ND<1.0	ND<1.0	VET
MW-8	08/18/07	421.01	16.27	404.74	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	16	ND<1.0	ND<1.0	VET
MW-8	07/30/08	421.01	15.99	405.02	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	14	ND<1.0	ND<1.0	VET
MW-8	10/16/09	421.01	16.30	404.71	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	14	ND<1.0	ND<1.0	VET
MW-8	08/19/10	421.01	15.42	405.59	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	15	1.3	ND<1.0	VET
MW-8	08/22/11	421.01	14.6	406.41	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	18	ND<1.0	ND<1.0	VET
MW-8	12/10/15	421.01	16.66	404.35									Dudek
MW-8	01/13/16				ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	11	ND<1.0	ND<1.0	Dudek
MW-9	10/08/99	423.01	18.42	404.59	ND<0.5	ND<0.5	ND<0.5	na	ND<0.5	6.3	ND<0.5	ND<0.5	VET
MW-9	11/02/99	423.01	18.43	404.58	na	na	na	na	na	na	na	na	VET
MW-9	05/10/00	423.01	17.95	405.06	ND<0.5	ND<0.5	ND<0.5	na	ND<0.5	15	ND<0.5	ND<0.5	VET
MW-9	02/02/01	423.01	18.44	404.57	0.72	ND<0.5	ND<0.5	na	ND<0.5	25	2.6	ND<0.5	VET
MW-9	04/04/03	423.01	na	na	1.4	ND<0.5	ND<0.5	ND<0.5	ND<0.5	37	1.1	na	VET
MW-9	04/14/03	423.01	na	na	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	9.2	ND<0.5	na	VET
MW-9	07/11/03	423.01	na	na	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	20	ND<0.5	ND<0.5	VET
MW-9	11/20/05	423.01	17.02	405.99	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	43	4.5	ND<0.5	VET

TABLE 2
HISTORICAL GROUNDWATER MONITORING DATA

Reuland Electric
17969 East Railroad Street, City of Industry, CA
Updated with 12/10/15 Groundwater Level Measurements by S. K. Dickey, Dudek
Updated With 1/13/16 Groundwater Sampling Event Data by S. K. Dickey, Dudek

WELL ID	SAMPLE DATE	DATUM ELEVATION	DEPTH TO GW	GW ELEVATION	1,1-DCE	1,2-DCA	1,1,1-TCA	c-1,2-DCE	t-1,2-DCE	PCE	TCE	FREON	REFERENCE
		(feet MSL)	(feet TOC)	(feet MSL)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	
MW-9	08/29/06	423.01	17.50	405.51	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	38	ND<1.0	ND<1.0	VET
MW-9	08/18/07	423.01	18.46	404.55	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	40	4.1	ND<1.0	VET
MW-9	07/30/08	423.01	18.27	404.74	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	16	1.6	ND<1.0	VET
MW-9	10/16/09	423.01	18.56	404.45	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	18	ND<1.0	ND<1.0	VET
MW-9	08/19/10	423.01	17.7	405.31	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	13	1.6	ND<1.0	VET
MW-9	08/22/11	423.01	16.9	406.11	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	18	ND<1.0	ND<1.0	VET
MW-9	12/10/15	423.01	18.89	404.12									Dudek
MW-9	01/13/16				ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	11	ND<1.0	ND<1.0	Dudek
MW-10	10/08/99	420.79	16.50	404.29	ND<0.5	ND<0.5	ND<0.5	na	ND<0.5	12	ND<0.5	ND<0.5	VET
MW-10	11/02/99	420.79	16.54	404.25	na	na	na	na	na	na	na	na	VET
MW-10	05/10/00	420.79	16.05	404.74	ND<0.5	ND<0.5	ND<0.5	na	ND<0.5	29	ND<0.5	ND<0.5	VET
MW-10	02/02/01	420.79	16.54	404.25	2.0	ND<0.5	ND<0.5	na	ND<0.5	14	ND<0.5	ND<0.5	VET
MW-10	04/04/03	420.79	na	na	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	2.9	ND<0.5	na	VET
MW-10	04/14/03	420.79	na	na	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	1.7	ND<0.5	na	VET
MW-10	07/11/03	420.79	na	na	ND<0.5	ND<0.5	ND<0.5	ND<0.5	2.0	1.4	ND<0.5	ND<0.5	VET
MW-10	11/20/05	420.79	15.12	405.67	ND<0.5	ND<0.5	ND<0.5	1.3	ND<0.5	9.0	1.2	ND<0.5	VET
MW-10	08/29/06	420.79	15.57	405.22	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	9.3	ND<1.0	ND<1.0	VET
MW-10	07/30/08	420.79	16.27	404.52	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	2.2	ND<1.0	ND<1.0	VET
MW-10	10/16/09	well destroyed			-----	-----	-----	-----	-----	-----	-----	-----	VET
MW-11	10/08/99	423.54	19.34	404.20	ND<0.5	ND<0.5	ND<0.5	na	ND<0.5	420	2.7	ND<0.5	VET
MW-11	11/02/99	423.54	19.35	404.19	na	na	na	na	na	na	na	na	VET
MW-11	05/10/00	423.54	18.83	404.71	ND<0.5	ND<0.5	ND<0.5	na	ND<0.5	810	2.8	ND<0.5	VET
MW-11	12/29/00	423.54	na	na	ND<0.5	ND<0.5	ND<0.5	na	ND<0.5	150	3.7	ND<0.5	VET
MW-11	02/02/01	423.54	19.31	404.23	ND<0.5	ND<0.5	ND<0.5	na	ND<0.5	69	1.4	ND<0.5	VET
MW-11	05/03/01	423.54	na	na	ND<0.5	ND<0.5	ND<0.5	na	ND<0.5	46	10	ND<0.5	VET
MW-11	08/22/01	423.54	na	na	ND<0.5	ND<0.5	ND<0.5	0.69	ND<0.5	110	3.0	ND<0.5	VET
MW-11	08/24/01	423.54	18.93	404.61	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	130	1.2	ND<0.5	VET
MW-11	09/18/01	423.54	na	na	ND<0.5	ND<0.5	ND<0.5	0.66	ND<0.5	225	1.7	ND<0.5	VET
MW-11	10/26/01	423.54	na	na	ND<0.5	ND<0.5	ND<0.5	4.9	ND<0.5	100	9.5	ND<0.5	VET
MW-11	11/29/01	423.54	na	na	ND<1.0	ND<1.0	ND<1.0	na	ND<1.0	290	ND<1.0	ND<1.0	VET
MW-11	03/24/03	423.54	na	na	ND<0.5	ND<0.5	ND<0.5	2.8	ND<0.5	320	12	na	VET
MW-11	04/04/03	423.54	na	na	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	9.4	ND<0.5	na	VET
MW-11	04/14/03	423.54	na	na	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	4.0	ND<0.5	na	VET
MW-11	07/11/03	423.54	na	na	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	19	,55	ND<0.5	VET
MW-11	11/20/05	423.54	17.89	405.65	ND<10	ND<10	ND<10	ND<0.5	ND<10	150	3.7	ND<10	VET
MW-11	08/29/06	423.54	18.37	405.17	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	110	ND<1.0	ND<1.0	VET
MW-11	08/18/07	423.54	19.37	404.17	ND<1	ND<1	ND<1	ND<1	ND<1	100	2.6	ND<1	VET
MW-11	07/30/08	423.54	19.16	404.38	ND<1	ND<1	ND<1	ND<1	ND<1	67	2.2	ND<1	VET
MW-11	10/16/09	423.54	19.41	404.13	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	65	2.1	ND<1.0	VET

TABLE 2
HISTORICAL GROUNDWATER MONITORING DATA

Reuland Electric
17969 East Railroad Street, City of Industry, CA
Updated with 12/10/15 Groundwater Level Measurements by S. K. Dickey, Dudek
Updated With 1/13/16 Groundwater Sampling Event Data by S. K. Dickey, Dudek

WELL ID	SAMPLE DATE	DATUM ELEVATION	DEPTH TO GW	GW ELEVATION	1,1-DCE	1,2-DCA	1,1,1-TCA	c-1,2-DCE	t-1,2-DCE	PCE	TCE	FREON	REFERENCE
		(feet MSL)	(feet TOC)	(feet MSL)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	
MW-11	08/19/10	423.54	18.53	405.01	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	40	1.0	ND<1.0	VET
MW-11	08/22/11	423.54	17.72	405.82	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	19	ND<1.0	ND<1.0	VET
MW-11	12/10/15	423.54	19.76	403.78									Dudek
MW-11	01/13/16				ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	33	0.95	ND<1.0	Dudek
MW-12	10/08/99	424.17	19.80	404.37	ND<0.5	ND<0.5	ND<0.5	na	ND<0.5	390	4.9	ND<0.5	VET
MW-12	11/02/99	424.17	19.83	404.34	na	na	na	na	na	na	na	na	VET
MW-12	05/10/00	424.17	19.29	404.88	ND<0.5	ND<0.5	ND<0.5	na	ND<0.5	270	4.6	ND<0.5	VET
MW-12	08/01/00	424.17	na	na	ND<0.5	ND<0.5	ND<0.5	na	ND<0.5	31	ND<0.5	ND<0.5	VET
MW-12	10/30/00	424.17	19.86	404.31	ND<0.5	ND<0.5	ND<0.5	na	ND<0.5	59	0.74	ND<0.5	VET
MW-12	12/07/00	424.17	19.80	404.37	ND<0.5	ND<0.5	ND<0.5	na	ND<0.5	43	ND<0.5	ND<0.5	VET
MW-12	12/29/00	424.17	na	na	ND<0.5	ND<0.5	ND<0.5	na	ND<0.5	53	ND<0.5	ND<0.5	VET
MW-12	02/02/01	424.17	19.80	404.37	ND<0.5	ND<0.5	ND<0.5	na	ND<0.5	150	1.1	ND<0.5	VET
MW-12-1	08/10/01	424.17	na	na	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	40	ND<0.5	ND<0.5	VET
MW-12 [b]	08/10/01	424.17	na	na	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	37	ND<0.5	ND<0.5	VET
MW-12 [c]	08/10/01	424.17	na	na	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	37	ND<0.5	ND<0.5	VET
MW-12 [d]	08/10/01	424.17	na	na	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	32	ND<0.5	ND<0.5	VET
MW-12-d	08/10/01	424.17	na	na	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	46	ND<0.5	ND<0.5	VET
MW-12-e	08/10/01	424.17	na	na	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	59	0.79	ND<0.5	VET
MW-12-f	08/10/01	424.17	na	na	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	57	0.96	ND<0.5	VET
MW-12	08/14/01	424.17	na	na	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	44	ND<0.5	ND<0.5	VET
MW-12	03/24/03	424.17	na	na	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	19	ND<0.5	na	VET
MW-12	04/04/03	424.17	na	na	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	5.0	ND<0.5	na	VET
MW-12	04/14/03	424.17	na	na	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	4.6	ND<0.5	na	VET
MW-12	07/11/03	424.17	na	na	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	7.3	ND<0.5	ND<0.5	VET
MW-12	11/20/05	424.17	18.32	405.85	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	88	ND<0.5	ND<0.5	VET
MW-12	08/29/06	424.17	18.83	405.34	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	89	ND<1.0	ND<1.0	VET
MW-12	08/18/07	424.17	19.86	404.31	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	100	2.6	ND<1.0	VET
MW-12	07/30/08	424.17	19.65	404.52	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	63	ND<1.0	ND<1.0	VET
MW-12	10/16/09	424.17	19.91	404.26	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	66	ND<1.0	ND<1.0	VET
MW-12	08/19/10	424.17	19	405.17	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	21	ND<1.0	ND<1.0	VET
MW-12	08/22/11	424.17	18.19	405.98	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	24	ND<1.0	ND<1.0	VET
MW-12	12/10/15	424.17	20.23	403.94									Dudek
MW-12	01/13/16				ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	8	ND<1.0	ND<1.0	Dudek
				MCLs:	6.0				10.0	5.0	5.0	5.0	

NOTES: Datum elevation is top of well casing (TOC) specified as NGVD29 up to January 22, 1999. Starting October 8, 1999 elevation specified as NAVD88.
New datum elevations indicated in the 10/8/99 data were measured by OKO Engineering 10/25/99. At LA Harbor NAVD88 is + 2.4 feet higher than NGVD29 for Benchmark A1296
GW = groundwater; ug/L = micrograms per liter; (d) = duplicate sample
na = not analyzed, available, nor applicable; ND = not detectable at or above lab detection limits.
MCLs established by the State of California Department of Health Services.

QA/QC

TABLE 2
HISTORICAL GROUNDWATER MONITORING DATA

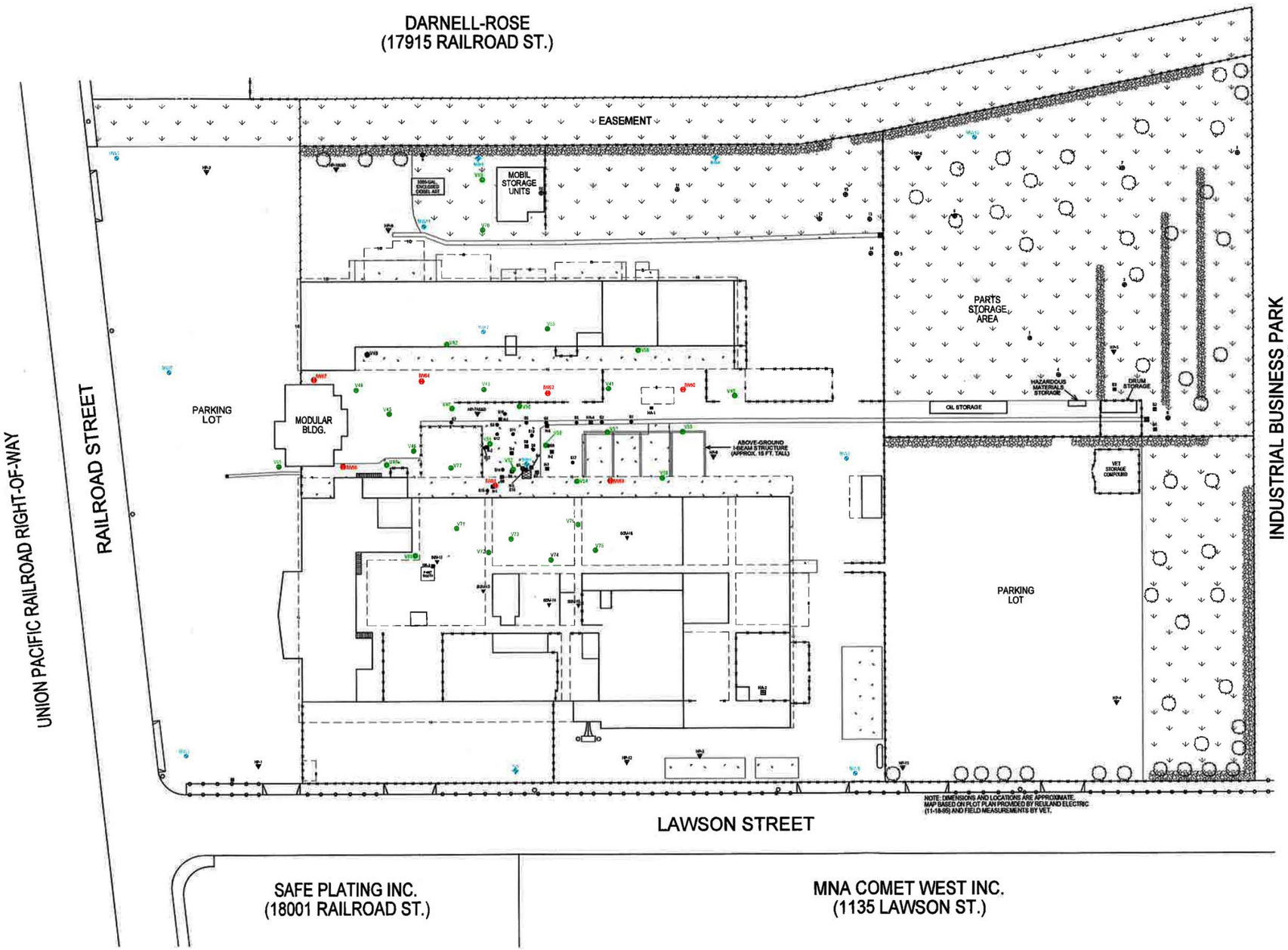
Reuland Electric
17969 East Railroad Street, City of Industry, CA
Updated with 12/10/15 Groundwater Level Measurements by S. K. Dickey, Dudek
Updated With 1/13/16 Groundwater Sampling Event Data by S. K. Dickey, Dudek

WELL ID	SAMPLE DATE	DATUM ELEVATION	DEPTH TO GW	GW ELEVATION	1,1-DCE	1,2-DCA	1,1,1-TCA	c-1,2-DCE	t-1,2-DCE	PCE	TCE	FREON	REFERENCE
		(feet MSL)	(feet TOC)	(feet MSL)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	

1,1-DCE = 1,1-Dichloroethene
1,2-DCA = 1,2-Dichloroethane
1,1,1-TCA = 1,1,1-Trichloroethane
c-1,2-DCE = cis-1,2-Dichloroethene
t-1,2-DCE = trans-1,2-Dichloroethene
PCE = tetrachloroethene
TCE = trichloroethene
FREON = trichlorofluoromethane

REFERENCE = Source for historical data from Quarterly Investigations (QI) report dated 10/25/96; laboratory data from Block Environmental (Block) dated 3/3/99; data from Vapor Extraction Technology (VET) reports: 1) Comprehensive Site Assessment dated March 4, 2004, and Groundwater Monitoring Report, dated December 18, 2005.

In some cases the wells may have been gauged the day prior to sampling.



LEGEND

- SOIL BORING COMPLETED BY IT IN 7/83
- SOIL BORING COMPLETED BY JMM IN 8/88, 1/89, AND 5/90
- GROUNDWATER MONITORING WELL INSTALLED BY JMM IN 1/89
- HYDROPUNCH GW SAMPLE COLLECTED BY JMM IN 5/90
- GEOPROBE SOIL BORING COMPLETED BY QI IN 12/94
- SOIL BORING COMPLETED BY QI IN 5/96
- GEOPROBE SOIL BORING COMPLETED BY BLOCK ENVIRONMENTAL IN 7/98
- AIR SPARGE/ IN-SITU OXIDATION WELL
- VAPOR EXTRACTION OR AIR INJECTION WELL
- GROUNDWATER MONITORING WELL
- PROPERTY LINE
- BRICK WALL
- ROOF OUTLINE WITH DISTANCE ABOVE GROUND
- CHAIN-LINK FENCE
- WOOD-POST FENCE (3.5 FEET TALL)
- PROPANE STORAGE TANK
- DRAINAGE SWALE AND STORM DRAIN
- CONCRETE
- GRASSY OR BARE LAND
- TREE
- HEDGE
- POWER POLE
- POWER TRANSFORMER & DROP TO BLDG. (APPROX. 15 FT. ABOVE GROUND)
- STAIRS
- FORMER SUMP LOCATION

0 20 40 60 80
FEET

FILE: p\REULAND\SITEPLN
REV: 7/3/00; 12/18/05

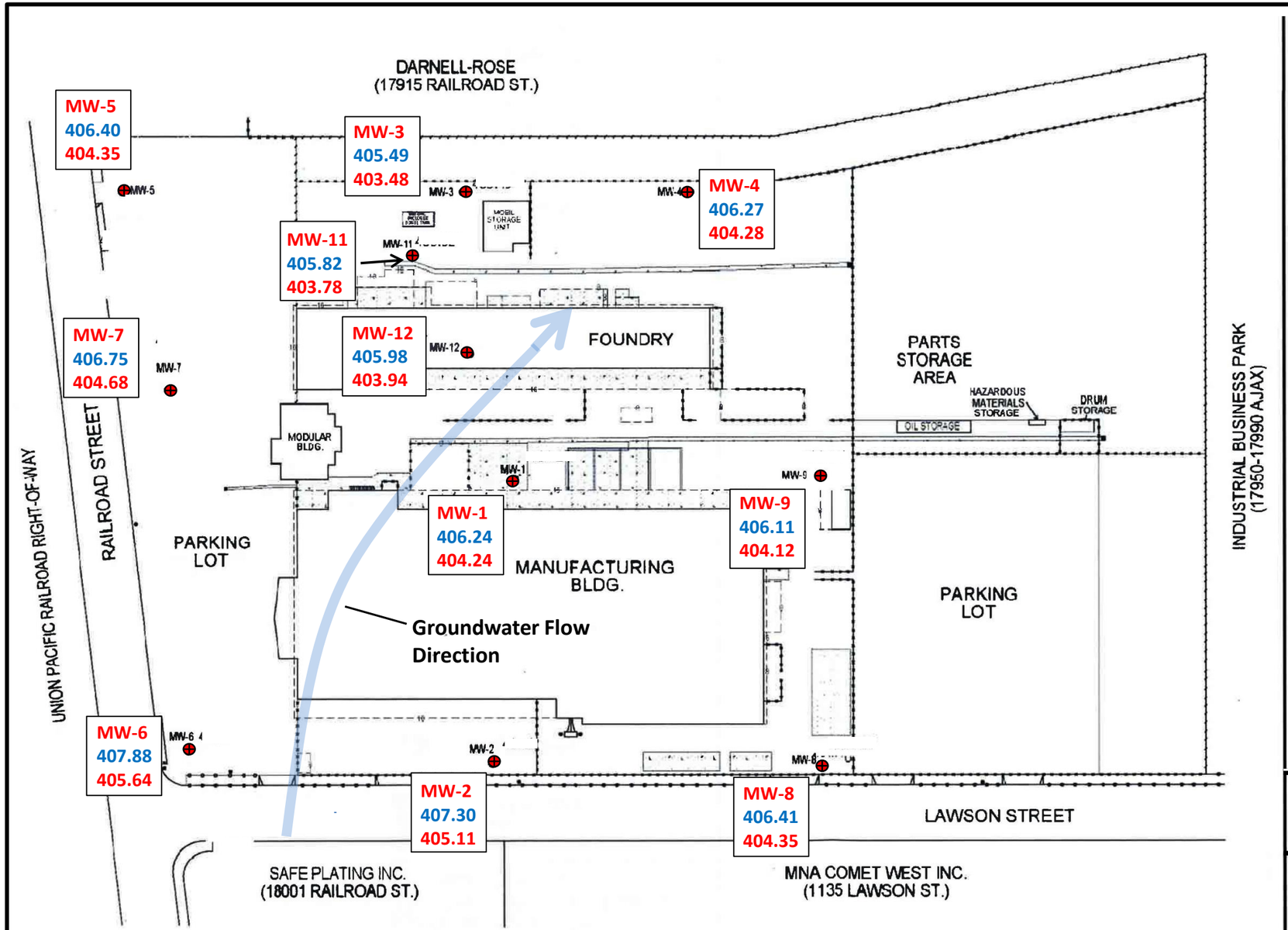
VAPOR EXTRACTION TECHNOLOGY, INC.
San Clemente, CA 949/492-7732

SITE:
REULAND ELECTRIC
17969 EAST RAILROAD STREET
CITY OF INDUSTRY, CA

VET PROJ. No: 200-000

FIGURE No. 1
SITE PLAN

NOTE: Figure reproduced from VET Report, September 23, 2011 "GROUNDWATER MONITORING REPORT, Annual Measurements-August 22, 2011"



NOTE: DIMENSIONS AND LOCATIONS ARE APPROXIMATE.
MAP BASED ON PLOT PLAN PROVIDED BY REULAND ELECTRIC (11-18-95) AND FIELD MEASUREMENTS BY VET

LEGEND

- MW-1 — GROUNDWATER MONITORING WELL
- PROPERTY LINE
- BRICK WALL
- ROOF OUTLINE WITH DISTANCE ABOVE GROUND
- CHAIN-LINK FENCE
- WOOD-POST FENCE (3.5 FEET TALL)
- PROPANE STORAGE TANK
- DRAINAGE SWALE AND STORM DRAIN
- CONCRETE
- POWER POLE
- POWER TRANSFORMER & DROP TO BLDG. (APPROX. 15 FT. ABOVE GROUND

MW-3
405.49
403.48

Groundwater Elevation, Measured 8/22/11

Groundwater Elevation, Measured 12/10/15

NOTE:
Groundwater elevation datum is NAVD88
Well Casing Top Survey by OKO Engineering, 10/8/99 for Vapor Extraction Technology

0 20 40 60 80
FEET

FILE: tpl\REULAND\GWELEV
REV: 11/20/06

VAPOR EXTRACTION TECHNOLOGY, INC.
San Clemente, CA (949)492-7732

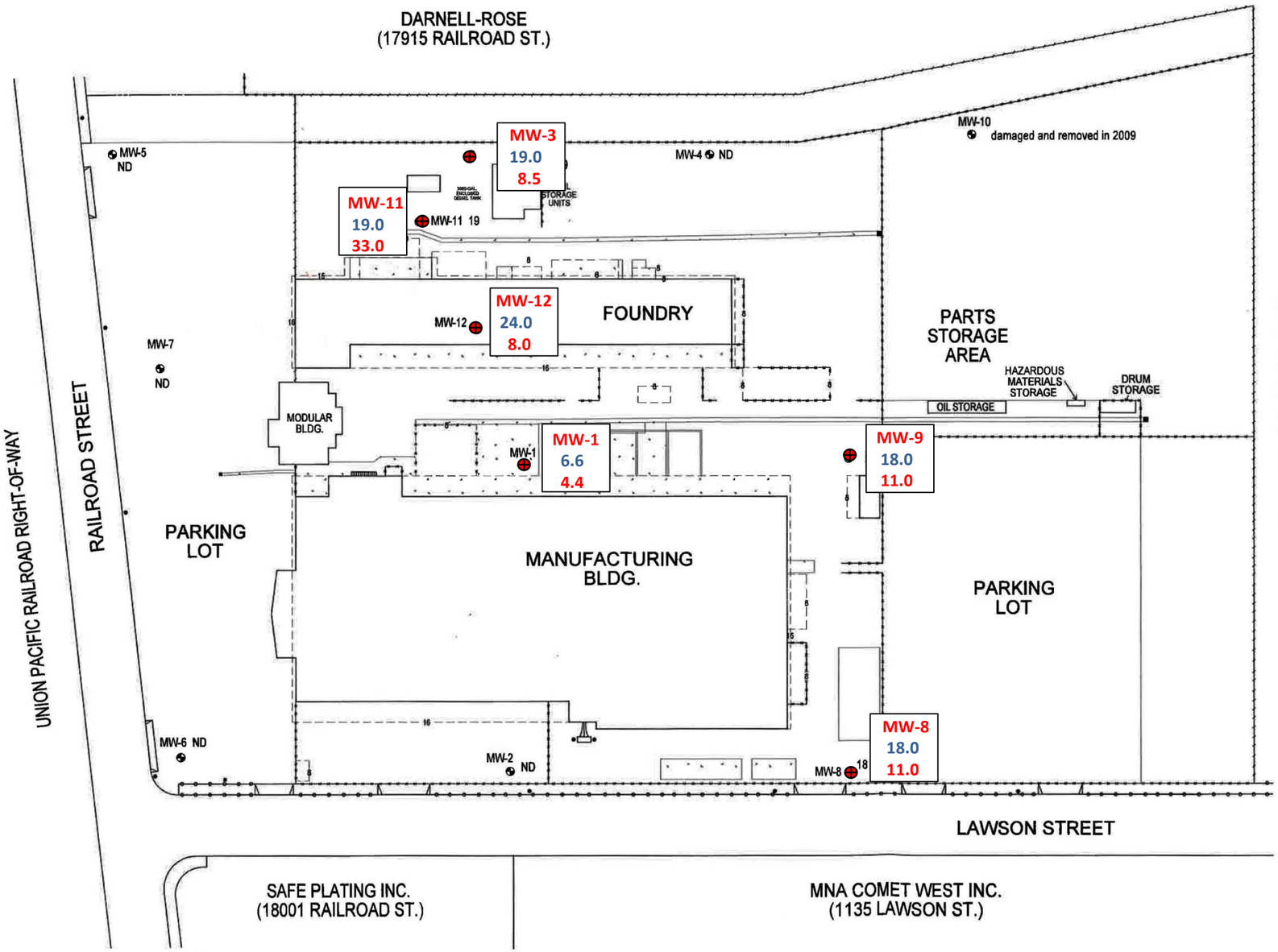
SITE:

REULAND ELECTRIC
17969 EAST RAILROAD STREET
CITY OF INDUSTRY, CA

VET PROJ. No: 200-000

FIGURE 2
GROUNDWATER ELEVATIONS MEASURED ON 8/22/11 (VET) AND 12/10/16 (DUDEK)

DUDEK



LEGEND

- MW-1 — GROUNDWATER MONITORING WELL
- PROPERTY LINE
- BRICK WALL
- ROOF OUTLINE WITH DISTANCE ABOVE GROUND
- CHAIN-LINK FENCE
- WOOD-POST FENCE (3.5 FEET TALL)
- PROPANE STORAGE TANK
- DRAINAGE SWALE AND STORM DRAIN
- CONCRETE
- POWER POLE — POWER TRANSFORMER & DROP TO BLDG. (APPROX. 15 FT. ABOVE GROUND)

DISSOLVED-PHASE PCE IN GROUNDWATER IN MICROGRAMS PER LITER (ug/L).
ND = NONDETECTABLE

MW-9
18.0
11.0

- Well Number
- PCE, ug/L, 8/22/11
- PCE, ug/L, 1/13/16

0 20 40 60 80
FEET

FILE: tpl\REULAND\pce
REV: 11/20/05

VAPOR EXTRACTION TECHNOLOGY, INC.
San Clemente, CA 949/492-7732

SITE:

REULAND ELECTRIC
17969 EAST RAILROAD STREET
CITY OF INDUSTRY, CA

VET PROJ. No: 200-000

FIGURE 3
PCE IN GROUNDWATER
SAMPLED 8/22/11 (VET)
AND 1/13/16 (DUDEK)

NOTE:
PCE data shown for 1/13/16 sampling event is by Test America, Irvine. Job ID: 440-134908-1

NOTE: DIMENSIONS AND LOCATIONS ARE APPROXIMATE.
MAP BASED ON PLOT PLAN PROVIDED BY REULAND ELECTRIC (11-18-95) AND FIELD MEASUREMENTS BY VET.

DUDEK

APPENDIX A

Laboratory Analytical Reports

January 13, 2016 Groundwater Samples

Reuland Electric

City of Industry, CA

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Irvine
17461 Derian Ave
Suite 100
Irvine, CA 92614-5817
Tel: (949)261-1022

TestAmerica Job ID: 440-134908-1
Client Project/Site: Reuland Electric

For:
Dudek & Associates
3544 University Ave
Riverside, California 92501

Attn: Steve Dickey

Authorized for release by:
1/18/2016 4:18:27 PM

Danielle Roberts, Senior Project Manager
(949)261-1022
danielle.roberts@testamericainc.com

Table of Contents

Sample Summary

Client: Dudek & Associates
Project/Site: Reuland Electric

TestAmerica Job ID: 440-134908-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
440-134908-1	MW-9	Water	01/13/16 12:40	01/13/16 18:00
440-134908-2	MW-8	Water	01/13/16 12:50	01/13/16 18:00
440-134908-3	MW-8 DUPE	Water	01/13/16 12:55	01/13/16 18:00
440-134908-4	TRIP BLANK	Water	01/13/16 15:50	01/13/16 18:00
440-134908-5	MW-3	Water	01/13/16 15:50	01/13/16 18:00
440-134908-6	MW-12	Water	01/13/16 16:00	01/13/16 18:00
440-134908-7	MW-11	Water	01/13/16 16:10	01/13/16 18:00
440-134908-8	MW-1	Water	01/13/16 13:10	01/13/16 18:00

Job ID: 440-134908-1

Laboratory: TestAmerica Irvine

Narrative

Job Narrative
440-134908-1

Comments
No additional comments.

Receipt
The samples were received on 1/13/2016 6:00 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 3.5º C.

Receipt Exceptions

<EXPLANATION_REQUIRED>

MW-9 (440-134908-1)

for this sample A-1 the time is not on the sample
for C-1 the time on the bottle is 1200 while on the coc it says 1240

GC/MS VOA
Method(s) 8260B: The continuing calibration verification (CCV) associated with batch 440-306116 recovered above the upper control limit for 2,2-Dichloropropane. The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported. The following samples are impacted: MW-3 (440-134908-5), MW-12 (440-134908-6), MW-11 (440-134908-7), MW-1 (440-134908-8) and (CCVIS 440-306116/2).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Client: Dudek & Associates
Project/Site: Reuland Electric

TestAmerica Job ID: 440-134908-1

Client Sample ID: MW-9
Date Collected: 01/13/16 12:40
Date Received: 01/13/16 18:00

Lab Sample ID: 440-134908-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	ND		0.50	0.25	ug/L			01/15/16 16:11	1
1,1,1-Trichloroethane	ND		0.50	0.25	ug/L			01/15/16 16:11	1
1,1,2,2-Tetrachloroethane	ND		0.50	0.25	ug/L			01/15/16 16:11	1
1,1,2-Trichloroethane	ND		0.50	0.25	ug/L			01/15/16 16:11	1
1,1-Dichloroethane	ND		0.50	0.25	ug/L			01/15/16 16:11	1
1,1-Dichloroethene	ND		0.50	0.25	ug/L			01/15/16 16:11	1
1,1-Dichloropropene	ND		0.50	0.25	ug/L			01/15/16 16:11	1
1,2,3-Trichlorobenzene	ND		1.0	0.40	ug/L			01/15/16 16:11	1
1,2,3-Trichloropropane	ND		0.50	0.25	ug/L			01/15/16 16:11	1
1,2,4-Trichlorobenzene	ND		1.0	0.40	ug/L			01/15/16 16:11	1
1,2,4-Trimethylbenzene	ND		0.50	0.25	ug/L			01/15/16 16:11	1
1,2-Dibromo-3-Chloropropane	ND		1.0	0.50	ug/L			01/15/16 16:11	1
1,2-Dibromoethane (EDB)	ND		0.50	0.25	ug/L			01/15/16 16:11	1
1,2-Dichlorobenzene	ND		0.50	0.25	ug/L			01/15/16 16:11	1
1,2-Dichloroethane	ND		0.50	0.25	ug/L			01/15/16 16:11	1
1,2-Dichloropropane	ND		0.50	0.25	ug/L			01/15/16 16:11	1
1,3-Dichlorobenzene	ND		0.50	0.25	ug/L			01/15/16 16:11	1
1,3-Dichloropropane	ND		0.50	0.25	ug/L			01/15/16 16:11	1
1,4-Dichlorobenzene	ND		0.50	0.25	ug/L			01/15/16 16:11	1
2,2-Dichloropropane	ND		1.0	0.40	ug/L			01/15/16 16:11	1
2-Chlorotoluene	ND		0.50	0.25	ug/L			01/15/16 16:11	1
4-Chlorotoluene	ND		0.50	0.25	ug/L			01/15/16 16:11	1
Benzene	ND		0.50	0.25	ug/L			01/15/16 16:11	1
Bromobenzene	ND		0.50	0.25	ug/L			01/15/16 16:11	1
Bromochloromethane	ND		0.50	0.25	ug/L			01/15/16 16:11	1
Bromodichloromethane	ND		0.50	0.25	ug/L			01/15/16 16:11	1
Bromoform	ND		1.0	0.40	ug/L			01/15/16 16:11	1
Bromomethane	ND		0.50	0.25	ug/L			01/15/16 16:11	1
Carbon tetrachloride	ND		0.50	0.25	ug/L			01/15/16 16:11	1
Chlorobenzene	ND		0.50	0.25	ug/L			01/15/16 16:11	1
Chloroethane	ND		1.0	0.40	ug/L			01/15/16 16:11	1
Chloroform	ND		0.50	0.25	ug/L			01/15/16 16:11	1
Chloromethane	ND		0.50	0.25	ug/L			01/15/16 16:11	1
cis-1,2-Dichloroethene	ND		0.50	0.25	ug/L			01/15/16 16:11	1
cis-1,3-Dichloropropene	ND		0.50	0.25	ug/L			01/15/16 16:11	1
Dibromochloromethane	ND		0.50	0.25	ug/L			01/15/16 16:11	1
Dibromomethane	ND		0.50	0.25	ug/L			01/15/16 16:11	1
Dichlorodifluoromethane	ND		0.50	0.25	ug/L			01/15/16 16:11	1
Isopropyl Ether (DIPE)	ND		0.50	0.25	ug/L			01/15/16 16:11	1
Ethyl-t-butyl ether (ETBE)	ND		0.50	0.25	ug/L			01/15/16 16:11	1
Hexachlorobutadiene	ND		0.50	0.25	ug/L			01/15/16 16:11	1
Isopropylbenzene	ND		0.50	0.25	ug/L			01/15/16 16:11	1
m,p-Xylene	ND		1.0	0.50	ug/L			01/15/16 16:11	1
Methylene Chloride	ND		2.0	0.88	ug/L			01/15/16 16:11	1
Methyl-t-Butyl Ether (MTBE)	ND		0.50	0.25	ug/L			01/15/16 16:11	1
Naphthalene	ND		1.0	0.40	ug/L			01/15/16 16:11	1
n-Butylbenzene	ND		1.0	0.40	ug/L			01/15/16 16:11	1
N-Propylbenzene	ND		0.50	0.25	ug/L			01/15/16 16:11	1
o-Xylene	ND		0.50	0.25	ug/L			01/15/16 16:11	1

Client Sample ID: MW-9

Lab Sample ID: 440-134908-1

Date Collected: 01/13/16 12:40

Matrix: Water

Date Received: 01/13/16 18:00

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
p-Isopropyltoluene	ND		0.50	0.25	ug/L			01/15/16 16:11	1
sec-Butylbenzene	ND		0.50	0.25	ug/L			01/15/16 16:11	1
Styrene	ND		0.50	0.25	ug/L			01/15/16 16:11	1
Tert-amyl-methyl ether (TAME)	ND		0.50	0.25	ug/L			01/15/16 16:11	1
tert-Butyl alcohol (TBA)	ND		10	5.0	ug/L			01/15/16 16:11	1
tert-Butylbenzene	ND		0.50	0.25	ug/L			01/15/16 16:11	1
Tetrachloroethene	**11**		0.50	0.25	ug/L			01/15/16 16:11	1
Toluene	ND		0.50	0.25	ug/L			01/15/16 16:11	1
trans-1,2-Dichloroethene	ND		0.50	0.25	ug/L			01/15/16 16:11	1
trans-1,3-Dichloropropene	ND		0.50	0.25	ug/L			01/15/16 16:11	1
Trichloroethene	ND		0.50	0.25	ug/L			01/15/16 16:11	1
Trichlorofluoromethane	ND		0.50	0.25	ug/L			01/15/16 16:11	1
Vinyl chloride	ND		0.50	0.25	ug/L			01/15/16 16:11	1
Xylenes, Total	ND		1.0	0.50	ug/L			01/15/16 16:11	1
1,3,5-Trimethylbenzene	ND		0.50	0.25	ug/L			01/15/16 16:11	1
Ethylbenzene	ND		0.50	0.25	ug/L			01/15/16 16:11	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*101*		*80 - 120*		*01/15/16 16:11*	*1*
Dibromofluoromethane (Surr)	*105*		*76 - 132*		*01/15/16 16:11*	*1*
Toluene-d8 (Surr)	*97*		*80 - 128*		*01/15/16 16:11*	*1*

Client Sample ID: MW-8

Lab Sample ID: 440-134908-2

Date Collected: 01/13/16 12:50

Matrix: Water

Date Received: 01/13/16 18:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	ND		0.50	0.25	ug/L			01/15/16 16:39	1
1,1,1-Trichloroethane	ND		0.50	0.25	ug/L			01/15/16 16:39	1
1,1,2,2-Tetrachloroethane	ND		0.50	0.25	ug/L			01/15/16 16:39	1
1,1,2-Trichloroethane	ND		0.50	0.25	ug/L			01/15/16 16:39	1
1,1-Dichloroethane	ND		0.50	0.25	ug/L			01/15/16 16:39	1
1,1-Dichloroethene	ND		0.50	0.25	ug/L			01/15/16 16:39	1
1,1-Dichloropropene	ND		0.50	0.25	ug/L			01/15/16 16:39	1
1,2,3-Trichlorobenzene	ND		1.0	0.40	ug/L			01/15/16 16:39	1
1,2,3-Trichloropropane	ND		0.50	0.25	ug/L			01/15/16 16:39	1
1,2,4-Trichlorobenzene	ND		1.0	0.40	ug/L			01/15/16 16:39	1
1,2,4-Trimethylbenzene	ND		0.50	0.25	ug/L			01/15/16 16:39	1
1,2-Dibromo-3-Chloropropane	ND		1.0	0.50	ug/L			01/15/16 16:39	1
1,2-Dibromoethane (EDB)	ND		0.50	0.25	ug/L			01/15/16 16:39	1
1,2-Dichlorobenzene	ND		0.50	0.25	ug/L			01/15/16 16:39	1
1,2-Dichloroethane	ND		0.50	0.25	ug/L			01/15/16 16:39	1
1,2-Dichloropropane	ND		0.50	0.25	ug/L			01/15/16 16:39	1
1,3-Dichlorobenzene	ND		0.50	0.25	ug/L			01/15/16 16:39	1
1,3-Dichloropropane	ND		0.50	0.25	ug/L			01/15/16 16:39	1
1,4-Dichlorobenzene	ND		0.50	0.25	ug/L			01/15/16 16:39	1
2,2-Dichloropropane	ND		1.0	0.40	ug/L			01/15/16 16:39	1
2-Chlorotoluene	ND		0.50	0.25	ug/L			01/15/16 16:39	1
4-Chlorotoluene	ND		0.50	0.25	ug/L			01/15/16 16:39	1

Client Sample ID: MW-8
Date Collected: 01/13/16 12:50
Date Received: 01/13/16 18:00

Lab Sample ID: 440-134908-2
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.50	0.25	ug/L			01/15/16 16:39	1
Bromobenzene	ND		0.50	0.25	ug/L			01/15/16 16:39	1
Bromochloromethane	ND		0.50	0.25	ug/L			01/15/16 16:39	1
Bromodichloromethane	ND		0.50	0.25	ug/L			01/15/16 16:39	1
Bromoform	ND		1.0	0.40	ug/L			01/15/16 16:39	1
Bromomethane	ND		0.50	0.25	ug/L			01/15/16 16:39	1
Carbon tetrachloride	ND		0.50	0.25	ug/L			01/15/16 16:39	1
Chlorobenzene	ND		0.50	0.25	ug/L			01/15/16 16:39	1
Chloroethane	ND		1.0	0.40	ug/L			01/15/16 16:39	1
Chloroform	ND		0.50	0.25	ug/L			01/15/16 16:39	1
Chloromethane	ND		0.50	0.25	ug/L			01/15/16 16:39	1
cis-1,2-Dichloroethene	ND		0.50	0.25	ug/L			01/15/16 16:39	1
cis-1,3-Dichloropropene	ND		0.50	0.25	ug/L			01/15/16 16:39	1
Dibromochloromethane	ND		0.50	0.25	ug/L			01/15/16 16:39	1
Dibromomethane	ND		0.50	0.25	ug/L			01/15/16 16:39	1
Dichlorodifluoromethane	ND		0.50	0.25	ug/L			01/15/16 16:39	1
Isopropyl Ether (DIPE)	ND		0.50	0.25	ug/L			01/15/16 16:39	1
Ethyl-t-butyl ether (ETBE)	ND		0.50	0.25	ug/L			01/15/16 16:39	1
Hexachlorobutadiene	ND		0.50	0.25	ug/L			01/15/16 16:39	1
Isopropylbenzene	ND		0.50	0.25	ug/L			01/15/16 16:39	1
m,p-Xylene	ND		1.0	0.50	ug/L			01/15/16 16:39	1
Methylene Chloride	ND		2.0	0.88	ug/L			01/15/16 16:39	1
Methyl-t-Butyl Ether (MTBE)	ND		0.50	0.25	ug/L			01/15/16 16:39	1
Naphthalene	ND		1.0	0.40	ug/L			01/15/16 16:39	1
n-Butylbenzene	ND		1.0	0.40	ug/L			01/15/16 16:39	1
N-Propylbenzene	ND		0.50	0.25	ug/L			01/15/16 16:39	1
o-Xylene	ND		0.50	0.25	ug/L			01/15/16 16:39	1
p-Isopropyltoluene	ND		0.50	0.25	ug/L			01/15/16 16:39	1
sec-Butylbenzene	ND		0.50	0.25	ug/L			01/15/16 16:39	1
Styrene	ND		0.50	0.25	ug/L			01/15/16 16:39	1
Tert-amyl-methyl ether (TAME)	ND		0.50	0.25	ug/L			01/15/16 16:39	1
tert-Butyl alcohol (TBA)	ND		10	5.0	ug/L			01/15/16 16:39	1
tert-Butylbenzene	ND		0.50	0.25	ug/L			01/15/16 16:39	1
Tetrachloroethene	**11**		0.50	0.25	ug/L			01/15/16 16:39	1
Toluene	ND		0.50	0.25	ug/L			01/15/16 16:39	1
trans-1,2-Dichloroethene	ND		0.50	0.25	ug/L			01/15/16 16:39	1
trans-1,3-Dichloropropene	ND		0.50	0.25	ug/L			01/15/16 16:39	1
Trichloroethene	ND		0.50	0.25	ug/L			01/15/16 16:39	1
Trichlorofluoromethane	ND		0.50	0.25	ug/L			01/15/16 16:39	1
Vinyl chloride	ND		0.50	0.25	ug/L			01/15/16 16:39	1
Xylenes, Total	ND		1.0	0.50	ug/L			01/15/16 16:39	1
1,3,5-Trimethylbenzene	ND		0.50	0.25	ug/L			01/15/16 16:39	1
Ethylbenzene	ND		0.50	0.25	ug/L			01/15/16 16:39	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*101*		*80 - 120*		*01/15/16 16:39*	*1*
Dibromofluoromethane (Surr)	*105*		*76 - 132*		*01/15/16 16:39*	*1*
Toluene-d8 (Surr)	*98*		*80 - 128*		*01/15/16 16:39*	*1*

Client: Dudek & Associates
Project/Site: Reuland Electric

TestAmerica Job ID: 440-134908-1

Client Sample ID: MW-8 DUPE
Date Collected: 01/13/16 12:55
Date Received: 01/13/16 18:00

Lab Sample ID: 440-134908-3
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	ND		0.50	0.25	ug/L			01/15/16 17:07	1
1,1,1-Trichloroethane	ND		0.50	0.25	ug/L			01/15/16 17:07	1
1,1,2,2-Tetrachloroethane	ND		0.50	0.25	ug/L			01/15/16 17:07	1
1,1,2-Trichloroethane	ND		0.50	0.25	ug/L			01/15/16 17:07	1
1,1-Dichloroethane	ND		0.50	0.25	ug/L			01/15/16 17:07	1
1,1-Dichloroethene	ND		0.50	0.25	ug/L			01/15/16 17:07	1
1,1-Dichloropropene	ND		0.50	0.25	ug/L			01/15/16 17:07	1
1,2,3-Trichlorobenzene	ND		1.0	0.40	ug/L			01/15/16 17:07	1
1,2,3-Trichloropropane	ND		0.50	0.25	ug/L			01/15/16 17:07	1
1,2,4-Trichlorobenzene	ND		1.0	0.40	ug/L			01/15/16 17:07	1
1,2,4-Trimethylbenzene	ND		0.50	0.25	ug/L			01/15/16 17:07	1
1,2-Dibromo-3-Chloropropane	ND		1.0	0.50	ug/L			01/15/16 17:07	1
1,2-Dibromoethane (EDB)	ND		0.50	0.25	ug/L			01/15/16 17:07	1
1,2-Dichlorobenzene	ND		0.50	0.25	ug/L			01/15/16 17:07	1
1,2-Dichloroethane	ND		0.50	0.25	ug/L			01/15/16 17:07	1
1,2-Dichloropropane	ND		0.50	0.25	ug/L			01/15/16 17:07	1
1,3-Dichlorobenzene	ND		0.50	0.25	ug/L			01/15/16 17:07	1
1,3-Dichloropropane	ND		0.50	0.25	ug/L			01/15/16 17:07	1
1,4-Dichlorobenzene	ND		0.50	0.25	ug/L			01/15/16 17:07	1
2,2-Dichloropropane	ND		1.0	0.40	ug/L			01/15/16 17:07	1
2-Chlorotoluene	ND		0.50	0.25	ug/L			01/15/16 17:07	1
4-Chlorotoluene	ND		0.50	0.25	ug/L			01/15/16 17:07	1
Benzene	ND		0.50	0.25	ug/L			01/15/16 17:07	1
Bromobenzene	ND		0.50	0.25	ug/L			01/15/16 17:07	1
Bromochloromethane	ND		0.50	0.25	ug/L			01/15/16 17:07	1
Bromodichloromethane	ND		0.50	0.25	ug/L			01/15/16 17:07	1
Bromoform	ND		1.0	0.40	ug/L			01/15/16 17:07	1
Bromomethane	ND		0.50	0.25	ug/L			01/15/16 17:07	1
Carbon tetrachloride	ND		0.50	0.25	ug/L			01/15/16 17:07	1
Chlorobenzene	ND		0.50	0.25	ug/L			01/15/16 17:07	1
Chloroethane	ND		1.0	0.40	ug/L			01/15/16 17:07	1
Chloroform	ND		0.50	0.25	ug/L			01/15/16 17:07	1
Chloromethane	ND		0.50	0.25	ug/L			01/15/16 17:07	1
cis-1,2-Dichloroethene	ND		0.50	0.25	ug/L			01/15/16 17:07	1
cis-1,3-Dichloropropene	ND		0.50	0.25	ug/L			01/15/16 17:07	1
Dibromochloromethane	ND		0.50	0.25	ug/L			01/15/16 17:07	1
Dibromomethane	ND		0.50	0.25	ug/L			01/15/16 17:07	1
Dichlorodifluoromethane	ND		0.50	0.25	ug/L			01/15/16 17:07	1
Isopropyl Ether (DIPE)	ND		0.50	0.25	ug/L			01/15/16 17:07	1
Ethyl-t-butyl ether (ETBE)	ND		0.50	0.25	ug/L			01/15/16 17:07	1
Hexachlorobutadiene	ND		0.50	0.25	ug/L			01/15/16 17:07	1
Isopropylbenzene	ND		0.50	0.25	ug/L			01/15/16 17:07	1
m,p-Xylene	ND		1.0	0.50	ug/L			01/15/16 17:07	1
Methylene Chloride	ND		2.0	0.88	ug/L			01/15/16 17:07	1
Methyl-t-Butyl Ether (MTBE)	ND		0.50	0.25	ug/L			01/15/16 17:07	1
Naphthalene	ND		1.0	0.40	ug/L			01/15/16 17:07	1
n-Butylbenzene	ND		1.0	0.40	ug/L			01/15/16 17:07	1
N-Propylbenzene	ND		0.50	0.25	ug/L			01/15/16 17:07	1
o-Xylene	ND		0.50	0.25	ug/L			01/15/16 17:07	1

Client Sample ID: MW-8 DUPE

Lab Sample ID: 440-134908-3
Matrix: Water
Date Collected: 01/13/16 12:55
Date Received: 01/13/16 18:00

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
p-Isopropyltoluene	ND		0.50	0.25	ug/L			01/15/16 17:07	1
sec-Butylbenzene	ND		0.50	0.25	ug/L			01/15/16 17:07	1
Styrene	ND		0.50	0.25	ug/L			01/15/16 17:07	1
Tert-amyl-methyl ether (TAME)	ND		0.50	0.25	ug/L			01/15/16 17:07	1
tert-Butyl alcohol (TBA)	ND		10	5.0	ug/L			01/15/16 17:07	1
tert-Butylbenzene	ND		0.50	0.25	ug/L			01/15/16 17:07	1
Tetrachloroethene	**11**		0.50	0.25	ug/L			01/15/16 17:07	1
Toluene	ND		0.50	0.25	ug/L			01/15/16 17:07	1
trans-1,2-Dichloroethene	ND		0.50	0.25	ug/L			01/15/16 17:07	1
trans-1,3-Dichloropropene	ND		0.50	0.25	ug/L			01/15/16 17:07	1
Trichloroethene	ND		0.50	0.25	ug/L			01/15/16 17:07	1
Trichlorofluoromethane	ND		0.50	0.25	ug/L			01/15/16 17:07	1
Vinyl chloride	ND		0.50	0.25	ug/L			01/15/16 17:07	1
Xylenes, Total	ND		1.0	0.50	ug/L			01/15/16 17:07	1
1,3,5-Trimethylbenzene	ND		0.50	0.25	ug/L			01/15/16 17:07	1
Ethylbenzene	ND		0.50	0.25	ug/L			01/15/16 17:07	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*102*		*80 - 120*		*01/15/16 17:07*	*1*
Dibromofluoromethane (Surr)	*106*		*76 - 132*		*01/15/16 17:07*	*1*
Toluene-d8 (Surr)	*97*		*80 - 128*		*01/15/16 17:07*	*1*

Client Sample ID: TRIP BLANK

Lab Sample ID: 440-134908-4
Matrix: Water
Date Collected: 01/13/16 15:50
Date Received: 01/13/16 18:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	ND		0.50	0.25	ug/L			01/15/16 17:34	1
1,1,1-Trichloroethane	ND		0.50	0.25	ug/L			01/15/16 17:34	1
1,1,2,2-Tetrachloroethane	ND		0.50	0.25	ug/L			01/15/16 17:34	1
1,1,2-Trichloroethane	ND		0.50	0.25	ug/L			01/15/16 17:34	1
1,1-Dichloroethane	ND		0.50	0.25	ug/L			01/15/16 17:34	1
1,1-Dichloroethene	ND		0.50	0.25	ug/L			01/15/16 17:34	1
1,1-Dichloropropene	ND		0.50	0.25	ug/L			01/15/16 17:34	1
1,2,3-Trichlorobenzene	ND		1.0	0.40	ug/L			01/15/16 17:34	1
1,2,3-Trichloropropane	ND		0.50	0.25	ug/L			01/15/16 17:34	1
1,2,4-Trichlorobenzene	ND		1.0	0.40	ug/L			01/15/16 17:34	1
1,2,4-Trimethylbenzene	ND		0.50	0.25	ug/L			01/15/16 17:34	1
1,2-Dibromo-3-Chloropropane	ND		1.0	0.50	ug/L			01/15/16 17:34	1
1,2-Dibromoethane (EDB)	ND		0.50	0.25	ug/L			01/15/16 17:34	1
1,2-Dichlorobenzene	ND		0.50	0.25	ug/L			01/15/16 17:34	1
1,2-Dichloroethane	ND		0.50	0.25	ug/L			01/15/16 17:34	1
1,2-Dichloropropane	ND		0.50	0.25	ug/L			01/15/16 17:34	1
1,3-Dichlorobenzene	ND		0.50	0.25	ug/L			01/15/16 17:34	1
1,3-Dichloropropane	ND		0.50	0.25	ug/L			01/15/16 17:34	1
1,4-Dichlorobenzene	ND		0.50	0.25	ug/L			01/15/16 17:34	1
2,2-Dichloropropane	ND		1.0	0.40	ug/L			01/15/16 17:34	1
2-Chlorotoluene	ND		0.50	0.25	ug/L			01/15/16 17:34	1
4-Chlorotoluene	ND		0.50	0.25	ug/L			01/15/16 17:34	1

Client: Dudek & Associates
Project/Site: Reuland Electric

TestAmerica Job ID: 440-134908-1

Client Sample ID: TRIP BLANK
Date Collected: 01/13/16 15:50
Date Received: 01/13/16 18:00

Lab Sample ID: 440-134908-4
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.50	0.25	ug/L			01/15/16 17:34	1
Bromobenzene	ND		0.50	0.25	ug/L			01/15/16 17:34	1
Bromochloromethane	ND		0.50	0.25	ug/L			01/15/16 17:34	1
Bromodichloromethane	ND		0.50	0.25	ug/L			01/15/16 17:34	1
Bromoform	ND		1.0	0.40	ug/L			01/15/16 17:34	1
Bromomethane	ND		0.50	0.25	ug/L			01/15/16 17:34	1
Carbon tetrachloride	ND		0.50	0.25	ug/L			01/15/16 17:34	1
Chlorobenzene	ND		0.50	0.25	ug/L			01/15/16 17:34	1
Chloroethane	ND		1.0	0.40	ug/L			01/15/16 17:34	1
Chloroform	ND		0.50	0.25	ug/L			01/15/16 17:34	1
Chloromethane	ND		0.50	0.25	ug/L			01/15/16 17:34	1
cis-1,2-Dichloroethene	ND		0.50	0.25	ug/L			01/15/16 17:34	1
cis-1,3-Dichloropropene	ND		0.50	0.25	ug/L			01/15/16 17:34	1
Dibromochloromethane	ND		0.50	0.25	ug/L			01/15/16 17:34	1
Dibromomethane	ND		0.50	0.25	ug/L			01/15/16 17:34	1
Dichlorodifluoromethane	ND		0.50	0.25	ug/L			01/15/16 17:34	1
Isopropyl Ether (DIPE)	ND		0.50	0.25	ug/L			01/15/16 17:34	1
Ethyl-t-butyl ether (ETBE)	ND		0.50	0.25	ug/L			01/15/16 17:34	1
Hexachlorobutadiene	ND		0.50	0.25	ug/L			01/15/16 17:34	1
Isopropylbenzene	ND		0.50	0.25	ug/L			01/15/16 17:34	1
m,p-Xylene	ND		1.0	0.50	ug/L			01/15/16 17:34	1
Methylene Chloride	ND		2.0	0.88	ug/L			01/15/16 17:34	1
Methyl-t-Butyl Ether (MTBE)	ND		0.50	0.25	ug/L			01/15/16 17:34	1
Naphthalene	ND		1.0	0.40	ug/L			01/15/16 17:34	1
n-Butylbenzene	ND		1.0	0.40	ug/L			01/15/16 17:34	1
N-Propylbenzene	ND		0.50	0.25	ug/L			01/15/16 17:34	1
o-Xylene	ND		0.50	0.25	ug/L			01/15/16 17:34	1
p-Isopropyltoluene	ND		0.50	0.25	ug/L			01/15/16 17:34	1
sec-Butylbenzene	ND		0.50	0.25	ug/L			01/15/16 17:34	1
Styrene	ND		0.50	0.25	ug/L			01/15/16 17:34	1
Tert-amyl-methyl ether (TAME)	ND		0.50	0.25	ug/L			01/15/16 17:34	1
tert-Butyl alcohol (TBA)	ND		10	5.0	ug/L			01/15/16 17:34	1
tert-Butylbenzene	ND		0.50	0.25	ug/L			01/15/16 17:34	1
Tetrachloroethene	ND		0.50	0.25	ug/L			01/15/16 17:34	1
Toluene	ND		0.50	0.25	ug/L			01/15/16 17:34	1
trans-1,2-Dichloroethene	ND		0.50	0.25	ug/L			01/15/16 17:34	1
trans-1,3-Dichloropropene	ND		0.50	0.25	ug/L			01/15/16 17:34	1
Trichloroethene	ND		0.50	0.25	ug/L			01/15/16 17:34	1
Trichlorofluoromethane	ND		0.50	0.25	ug/L			01/15/16 17:34	1
Vinyl chloride	ND		0.50	0.25	ug/L			01/15/16 17:34	1
Xylenes, Total	ND		1.0	0.50	ug/L			01/15/16 17:34	1
1,3,5-Trimethylbenzene	ND		0.50	0.25	ug/L			01/15/16 17:34	1
Ethylbenzene	ND		0.50	0.25	ug/L			01/15/16 17:34	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*101*		*80 - 120*		*01/15/16 17:34*	*1*
Dibromofluoromethane (Surr)	*104*		*76 - 132*		*01/15/16 17:34*	*1*
Toluene-d8 (Surr)	*97*		*80 - 128*		*01/15/16 17:34*	*1*

Client: Dudek & Associates
Project/Site: Reuland Electric

TestAmerica Job ID: 440-134908-1

Client Sample ID: MW-3
Date Collected: 01/13/16 15:50
Date Received: 01/13/16 18:00

Lab Sample ID: 440-134908-5
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	ND		0.50	0.25	ug/L			01/15/16 20:52	1
1,1,1-Trichloroethane	ND		0.50	0.25	ug/L			01/15/16 20:52	1
1,1,2,2-Tetrachloroethane	ND		0.50	0.25	ug/L			01/15/16 20:52	1
1,1,2-Trichloroethane	ND		0.50	0.25	ug/L			01/15/16 20:52	1
1,1-Dichloroethane	ND		0.50	0.25	ug/L			01/15/16 20:52	1
1,1-Dichloroethene	ND		0.50	0.25	ug/L			01/15/16 20:52	1
1,1-Dichloropropene	ND		0.50	0.25	ug/L			01/15/16 20:52	1
1,2,3-Trichlorobenzene	ND		1.0	0.40	ug/L			01/15/16 20:52	1
1,2,3-Trichloropropane	ND		0.50	0.25	ug/L			01/15/16 20:52	1
1,2,4-Trichlorobenzene	ND		1.0	0.40	ug/L			01/15/16 20:52	1
1,2,4-Trimethylbenzene	ND		0.50	0.25	ug/L			01/15/16 20:52	1
1,2-Dibromo-3-Chloropropane	ND		1.0	0.50	ug/L			01/15/16 20:52	1
1,2-Dibromoethane (EDB)	ND		0.50	0.25	ug/L			01/15/16 20:52	1
1,2-Dichlorobenzene	ND		0.50	0.25	ug/L			01/15/16 20:52	1
1,2-Dichloroethane	ND		0.50	0.25	ug/L			01/15/16 20:52	1
1,2-Dichloropropane	ND		0.50	0.25	ug/L			01/15/16 20:52	1
1,3-Dichlorobenzene	ND		0.50	0.25	ug/L			01/15/16 20:52	1
1,3-Dichloropropane	ND		0.50	0.25	ug/L			01/15/16 20:52	1
1,4-Dichlorobenzene	ND		0.50	0.25	ug/L			01/15/16 20:52	1
2,2-Dichloropropane	ND	F1	1.0	0.40	ug/L			01/15/16 20:52	1
2-Chlorotoluene	ND		0.50	0.25	ug/L			01/15/16 20:52	1
4-Chlorotoluene	ND		0.50	0.25	ug/L			01/15/16 20:52	1
Benzene	ND		0.50	0.25	ug/L			01/15/16 20:52	1
Bromobenzene	ND		0.50	0.25	ug/L			01/15/16 20:52	1
Bromochloromethane	ND		0.50	0.25	ug/L			01/15/16 20:52	1
Bromodichloromethane	ND		0.50	0.25	ug/L			01/15/16 20:52	1
Bromoform	ND		1.0	0.40	ug/L			01/15/16 20:52	1
Bromomethane	ND		0.50	0.25	ug/L			01/15/16 20:52	1
Carbon tetrachloride	ND		0.50	0.25	ug/L			01/15/16 20:52	1
Chlorobenzene	ND		0.50	0.25	ug/L			01/15/16 20:52	1
Chloroethane	ND		1.0	0.40	ug/L			01/15/16 20:52	1
Chloroform	ND		0.50	0.25	ug/L			01/15/16 20:52	1
Chloromethane	ND		0.50	0.25	ug/L			01/15/16 20:52	1
cis-1,2-Dichloroethene	ND		0.50	0.25	ug/L			01/15/16 20:52	1
cis-1,3-Dichloropropene	ND		0.50	0.25	ug/L			01/15/16 20:52	1
Dibromochloromethane	ND		0.50	0.25	ug/L			01/15/16 20:52	1
Dibromomethane	ND		0.50	0.25	ug/L			01/15/16 20:52	1
Dichlorodifluoromethane	ND		0.50	0.25	ug/L			01/15/16 20:52	1
Isopropyl Ether (DIPE)	ND		0.50	0.25	ug/L			01/15/16 20:52	1
Ethyl-t-butyl ether (ETBE)	ND		0.50	0.25	ug/L			01/15/16 20:52	1
Hexachlorobutadiene	ND		0.50	0.25	ug/L			01/15/16 20:52	1
Isopropylbenzene	ND		0.50	0.25	ug/L			01/15/16 20:52	1
m,p-Xylene	ND		1.0	0.50	ug/L			01/15/16 20:52	1
Methylene Chloride	ND		2.0	0.88	ug/L			01/15/16 20:52	1
Methyl-t-Butyl Ether (MTBE)	ND		0.50	0.25	ug/L			01/15/16 20:52	1
Naphthalene	ND		1.0	0.40	ug/L			01/15/16 20:52	1
n-Butylbenzene	ND		1.0	0.40	ug/L			01/15/16 20:52	1
N-Propylbenzene	ND		0.50	0.25	ug/L			01/15/16 20:52	1
o-Xylene	ND		0.50	0.25	ug/L			01/15/16 20:52	1

Client Sample ID: MW-3

Lab Sample ID: 440-134908-5

Date Collected: 01/13/16 15:50

Matrix: Water

Date Received: 01/13/16 18:00

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
p-Isopropyltoluene	ND		0.50	0.25	ug/L			01/15/16 20:52	1
sec-Butylbenzene	ND		0.50	0.25	ug/L			01/15/16 20:52	1
Styrene	ND		0.50	0.25	ug/L			01/15/16 20:52	1
Tert-amyl-methyl ether (TAME)	ND		0.50	0.25	ug/L			01/15/16 20:52	1
tert-Butyl alcohol (TBA)	ND		10	5.0	ug/L			01/15/16 20:52	1
tert-Butylbenzene	ND		0.50	0.25	ug/L			01/15/16 20:52	1
Tetrachloroethene	**8.5**		0.50	0.25	ug/L			01/15/16 20:52	1
Toluene	ND		0.50	0.25	ug/L			01/15/16 20:52	1
trans-1,2-Dichloroethene	ND		0.50	0.25	ug/L			01/15/16 20:52	1
trans-1,3-Dichloropropene	ND		0.50	0.25	ug/L			01/15/16 20:52	1
Trichloroethene	ND		0.50	0.25	ug/L			01/15/16 20:52	1
Trichlorofluoromethane	ND		0.50	0.25	ug/L			01/15/16 20:52	1
Vinyl chloride	ND		0.50	0.25	ug/L			01/15/16 20:52	1
Xylenes, Total	ND		1.0	0.50	ug/L			01/15/16 20:52	1
1,3,5-Trimethylbenzene	ND		0.50	0.25	ug/L			01/15/16 20:52	1
Ethylbenzene	ND		0.50	0.25	ug/L			01/15/16 20:52	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*91*		*80 - 120*		*01/15/16 20:52*	*1*
Dibromofluoromethane (Surr)	*97*		*76 - 132*		*01/15/16 20:52*	*1*
Toluene-d8 (Surr)	*96*		*80 - 128*		*01/15/16 20:52*	*1*

Client Sample ID: MW-12

Lab Sample ID: 440-134908-6

Date Collected: 01/13/16 16:00

Matrix: Water

Date Received: 01/13/16 18:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	ND		0.50	0.25	ug/L			01/15/16 22:23	1
1,1,1-Trichloroethane	ND		0.50	0.25	ug/L			01/15/16 22:23	1
1,1,2,2-Tetrachloroethane	ND		0.50	0.25	ug/L			01/15/16 22:23	1
1,1,2-Trichloroethane	ND		0.50	0.25	ug/L			01/15/16 22:23	1
1,1-Dichloroethane	ND		0.50	0.25	ug/L			01/15/16 22:23	1
1,1-Dichloroethene	ND		0.50	0.25	ug/L			01/15/16 22:23	1
1,1-Dichloropropene	ND		0.50	0.25	ug/L			01/15/16 22:23	1
1,2,3-Trichlorobenzene	ND		1.0	0.40	ug/L			01/15/16 22:23	1
1,2,3-Trichloropropane	ND		0.50	0.25	ug/L			01/15/16 22:23	1
1,2,4-Trichlorobenzene	ND		1.0	0.40	ug/L			01/15/16 22:23	1
1,2,4-Trimethylbenzene	ND		0.50	0.25	ug/L			01/15/16 22:23	1
1,2-Dibromo-3-Chloropropane	ND		1.0	0.50	ug/L			01/15/16 22:23	1
1,2-Dibromoethane (EDB)	ND		0.50	0.25	ug/L			01/15/16 22:23	1
1,2-Dichlorobenzene	ND		0.50	0.25	ug/L			01/15/16 22:23	1
1,2-Dichloroethane	ND		0.50	0.25	ug/L			01/15/16 22:23	1
1,2-Dichloropropane	ND		0.50	0.25	ug/L			01/15/16 22:23	1
1,3-Dichlorobenzene	ND		0.50	0.25	ug/L			01/15/16 22:23	1
1,3-Dichloropropane	ND		0.50	0.25	ug/L			01/15/16 22:23	1
1,4-Dichlorobenzene	ND		0.50	0.25	ug/L			01/15/16 22:23	1
2,2-Dichloropropane	ND		1.0	0.40	ug/L			01/15/16 22:23	1
2-Chlorotoluene	ND		0.50	0.25	ug/L			01/15/16 22:23	1
4-Chlorotoluene	ND		0.50	0.25	ug/L			01/15/16 22:23	1

Client Sample ID: MW-12
Date Collected: 01/13/16 16:00
Date Received: 01/13/16 18:00

Lab Sample ID: 440-134908-6
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.50	0.25	ug/L			01/15/16 22:23	1
Bromobenzene	ND		0.50	0.25	ug/L			01/15/16 22:23	1
Bromochloromethane	ND		0.50	0.25	ug/L			01/15/16 22:23	1
Bromodichloromethane	ND		0.50	0.25	ug/L			01/15/16 22:23	1
Bromoform	ND		1.0	0.40	ug/L			01/15/16 22:23	1
Bromomethane	ND		0.50	0.25	ug/L			01/15/16 22:23	1
Carbon tetrachloride	ND		0.50	0.25	ug/L			01/15/16 22:23	1
Chlorobenzene	ND		0.50	0.25	ug/L			01/15/16 22:23	1
Chloroethane	ND		1.0	0.40	ug/L			01/15/16 22:23	1
Chloroform	ND		0.50	0.25	ug/L			01/15/16 22:23	1
Chloromethane	ND		0.50	0.25	ug/L			01/15/16 22:23	1
cis-1,2-Dichloroethene	ND		0.50	0.25	ug/L			01/15/16 22:23	1
cis-1,3-Dichloropropene	ND		0.50	0.25	ug/L			01/15/16 22:23	1
Dibromochloromethane	ND		0.50	0.25	ug/L			01/15/16 22:23	1
Dibromomethane	ND		0.50	0.25	ug/L			01/15/16 22:23	1
Dichlorodifluoromethane	ND		0.50	0.25	ug/L			01/15/16 22:23	1
Isopropyl Ether (DIPE)	ND		0.50	0.25	ug/L			01/15/16 22:23	1
Ethyl-t-butyl ether (ETBE)	ND		0.50	0.25	ug/L			01/15/16 22:23	1
Hexachlorobutadiene	ND		0.50	0.25	ug/L			01/15/16 22:23	1
Isopropylbenzene	ND		0.50	0.25	ug/L			01/15/16 22:23	1
m,p-Xylene	ND		1.0	0.50	ug/L			01/15/16 22:23	1
Methylene Chloride	ND		2.0	0.88	ug/L			01/15/16 22:23	1
Methyl-t-Butyl Ether (MTBE)	ND		0.50	0.25	ug/L			01/15/16 22:23	1
Naphthalene	ND		1.0	0.40	ug/L			01/15/16 22:23	1
n-Butylbenzene	ND		1.0	0.40	ug/L			01/15/16 22:23	1
N-Propylbenzene	ND		0.50	0.25	ug/L			01/15/16 22:23	1
o-Xylene	ND		0.50	0.25	ug/L			01/15/16 22:23	1
p-Isopropyltoluene	ND		0.50	0.25	ug/L			01/15/16 22:23	1
sec-Butylbenzene	ND		0.50	0.25	ug/L			01/15/16 22:23	1
Styrene	ND		0.50	0.25	ug/L			01/15/16 22:23	1
Tert-amyl-methyl ether (TAME)	ND		0.50	0.25	ug/L			01/15/16 22:23	1
tert-Butyl alcohol (TBA)	ND		10	5.0	ug/L			01/15/16 22:23	1
tert-Butylbenzene	ND		0.50	0.25	ug/L			01/15/16 22:23	1
Tetrachloroethene	**8.0**		0.50	0.25	ug/L			01/15/16 22:23	1
Toluene	ND		0.50	0.25	ug/L			01/15/16 22:23	1
trans-1,2-Dichloroethene	ND		0.50	0.25	ug/L			01/15/16 22:23	1
trans-1,3-Dichloropropene	ND		0.50	0.25	ug/L			01/15/16 22:23	1
Trichloroethene	ND		0.50	0.25	ug/L			01/15/16 22:23	1
Trichlorofluoromethane	ND		0.50	0.25	ug/L			01/15/16 22:23	1
Vinyl chloride	ND		0.50	0.25	ug/L			01/15/16 22:23	1
Xylenes, Total	ND		1.0	0.50	ug/L			01/15/16 22:23	1
1,3,5-Trimethylbenzene	ND		0.50	0.25	ug/L			01/15/16 22:23	1
Ethylbenzene	ND		0.50	0.25	ug/L			01/15/16 22:23	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*94*		*80 - 120*		*01/15/16 22:23*	*1*
Dibromofluoromethane (Surr)	*99*		*76 - 132*		*01/15/16 22:23*	*1*
Toluene-d8 (Surr)	*99*		*80 - 128*		*01/15/16 22:23*	*1*

Client: Dudek & Associates
Project/Site: Reuland Electric

TestAmerica Job ID: 440-134908-1

Client Sample ID: MW-11
Date Collected: 01/13/16 16:10
Date Received: 01/13/16 18:00

Lab Sample ID: 440-134908-7
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	ND		0.50	0.25	ug/L			01/15/16 22:53	1
1,1,1-Trichloroethane	ND		0.50	0.25	ug/L			01/15/16 22:53	1
1,1,2,2-Tetrachloroethane	ND		0.50	0.25	ug/L			01/15/16 22:53	1
1,1,2-Trichloroethane	ND		0.50	0.25	ug/L			01/15/16 22:53	1
1,1-Dichloroethane	ND		0.50	0.25	ug/L			01/15/16 22:53	1
1,1-Dichloroethene	ND		0.50	0.25	ug/L			01/15/16 22:53	1
1,1-Dichloropropene	ND		0.50	0.25	ug/L			01/15/16 22:53	1
1,2,3-Trichlorobenzene	ND		1.0	0.40	ug/L			01/15/16 22:53	1
1,2,3-Trichloropropane	ND		0.50	0.25	ug/L			01/15/16 22:53	1
1,2,4-Trichlorobenzene	ND		1.0	0.40	ug/L			01/15/16 22:53	1
1,2,4-Trimethylbenzene	ND		0.50	0.25	ug/L			01/15/16 22:53	1
1,2-Dibromo-3-Chloropropane	ND		1.0	0.50	ug/L			01/15/16 22:53	1
1,2-Dibromoethane (EDB)	ND		0.50	0.25	ug/L			01/15/16 22:53	1
1,2-Dichlorobenzene	ND		0.50	0.25	ug/L			01/15/16 22:53	1
1,2-Dichloroethane	ND		0.50	0.25	ug/L			01/15/16 22:53	1
1,2-Dichloropropane	ND		0.50	0.25	ug/L			01/15/16 22:53	1
1,3-Dichlorobenzene	ND		0.50	0.25	ug/L			01/15/16 22:53	1
1,3-Dichloropropane	ND		0.50	0.25	ug/L			01/15/16 22:53	1
1,4-Dichlorobenzene	ND		0.50	0.25	ug/L			01/15/16 22:53	1
2,2-Dichloropropane	ND		1.0	0.40	ug/L			01/15/16 22:53	1
2-Chlorotoluene	ND		0.50	0.25	ug/L			01/15/16 22:53	1
4-Chlorotoluene	ND		0.50	0.25	ug/L			01/15/16 22:53	1
Benzene	ND		0.50	0.25	ug/L			01/15/16 22:53	1
Bromobenzene	ND		0.50	0.25	ug/L			01/15/16 22:53	1
Bromochloromethane	ND		0.50	0.25	ug/L			01/15/16 22:53	1
Bromodichloromethane	ND		0.50	0.25	ug/L			01/15/16 22:53	1
Bromoform	ND		1.0	0.40	ug/L			01/15/16 22:53	1
Bromomethane	ND		0.50	0.25	ug/L			01/15/16 22:53	1
Carbon tetrachloride	ND		0.50	0.25	ug/L			01/15/16 22:53	1
Chlorobenzene	ND		0.50	0.25	ug/L			01/15/16 22:53	1
Chloroethane	ND		1.0	0.40	ug/L			01/15/16 22:53	1
Chloroform	ND		0.50	0.25	ug/L			01/15/16 22:53	1
Chloromethane	ND		0.50	0.25	ug/L			01/15/16 22:53	1
cis-1,2-Dichloroethene	ND		0.50	0.25	ug/L			01/15/16 22:53	1
cis-1,3-Dichloropropene	ND		0.50	0.25	ug/L			01/15/16 22:53	1
Dibromochloromethane	ND		0.50	0.25	ug/L			01/15/16 22:53	1
Dibromomethane	ND		0.50	0.25	ug/L			01/15/16 22:53	1
Dichlorodifluoromethane	ND		0.50	0.25	ug/L			01/15/16 22:53	1
Isopropyl Ether (DIPE)	ND		0.50	0.25	ug/L			01/15/16 22:53	1
Ethyl-t-butyl ether (ETBE)	ND		0.50	0.25	ug/L			01/15/16 22:53	1
Hexachlorobutadiene	ND		0.50	0.25	ug/L			01/15/16 22:53	1
Isopropylbenzene	ND		0.50	0.25	ug/L			01/15/16 22:53	1
m,p-Xylene	ND		1.0	0.50	ug/L			01/15/16 22:53	1
Methylene Chloride	ND		2.0	0.88	ug/L			01/15/16 22:53	1
Methyl-t-Butyl Ether (MTBE)	ND		0.50	0.25	ug/L			01/15/16 22:53	1
Naphthalene	ND		1.0	0.40	ug/L			01/15/16 22:53	1
n-Butylbenzene	ND		1.0	0.40	ug/L			01/15/16 22:53	1
N-Propylbenzene	ND		0.50	0.25	ug/L			01/15/16 22:53	1
o-Xylene	ND		0.50	0.25	ug/L			01/15/16 22:53	1

Client Sample ID: MW-11

Lab Sample ID: 440-134908-7

Date Collected: 01/13/16 16:10

Matrix: Water

Date Received: 01/13/16 18:00

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
p-Isopropyltoluene	ND		0.50	0.25	ug/L			01/15/16 22:53	1
sec-Butylbenzene	ND		0.50	0.25	ug/L			01/15/16 22:53	1
Styrene	ND		0.50	0.25	ug/L			01/15/16 22:53	1
Tert-amyl-methyl ether (TAME)	ND		0.50	0.25	ug/L			01/15/16 22:53	1
tert-Butyl alcohol (TBA)	ND		10	5.0	ug/L			01/15/16 22:53	1
tert-Butylbenzene	ND		0.50	0.25	ug/L			01/15/16 22:53	1
Tetrachloroethene	**33**		0.50	0.25	ug/L			01/15/16 22:53	1
Toluene	ND		0.50	0.25	ug/L			01/15/16 22:53	1
trans-1,2-Dichloroethene	ND		0.50	0.25	ug/L			01/15/16 22:53	1
trans-1,3-Dichloropropene	ND		0.50	0.25	ug/L			01/15/16 22:53	1
Trichloroethene	**0.95**		0.50	0.25	ug/L			01/15/16 22:53	1
Trichlorofluoromethane	ND		0.50	0.25	ug/L			01/15/16 22:53	1
Vinyl chloride	ND		0.50	0.25	ug/L			01/15/16 22:53	1
Xylenes, Total	ND		1.0	0.50	ug/L			01/15/16 22:53	1
1,3,5-Trimethylbenzene	ND		0.50	0.25	ug/L			01/15/16 22:53	1
Ethylbenzene	ND		0.50	0.25	ug/L			01/15/16 22:53	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*93*		*80 - 120*		*01/15/16 22:53*	*1*
Dibromofluoromethane (Surr)	*99*		*76 - 132*		*01/15/16 22:53*	*1*
Toluene-d8 (Surr)	*97*		*80 - 128*		*01/15/16 22:53*	*1*

Client Sample ID: MW-1

Lab Sample ID: 440-134908-8

Date Collected: 01/13/16 13:10

Matrix: Water

Date Received: 01/13/16 18:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	ND		0.50	0.25	ug/L			01/15/16 23:24	1
1,1,1-Trichloroethane	ND		0.50	0.25	ug/L			01/15/16 23:24	1
1,1,2,2-Tetrachloroethane	ND		0.50	0.25	ug/L			01/15/16 23:24	1
1,1,2-Trichloroethane	ND		0.50	0.25	ug/L			01/15/16 23:24	1
1,1-Dichloroethane	ND		0.50	0.25	ug/L			01/15/16 23:24	1
1,1-Dichloroethene	ND		0.50	0.25	ug/L			01/15/16 23:24	1
1,1-Dichloropropene	ND		0.50	0.25	ug/L			01/15/16 23:24	1
1,2,3-Trichlorobenzene	ND		1.0	0.40	ug/L			01/15/16 23:24	1
1,2,3-Trichloropropane	ND		0.50	0.25	ug/L			01/15/16 23:24	1
1,2,4-Trichlorobenzene	ND		1.0	0.40	ug/L			01/15/16 23:24	1
1,2,4-Trimethylbenzene	ND		0.50	0.25	ug/L			01/15/16 23:24	1
1,2-Dibromo-3-Chloropropane	ND		1.0	0.50	ug/L			01/15/16 23:24	1
1,2-Dibromoethane (EDB)	ND		0.50	0.25	ug/L			01/15/16 23:24	1
1,2-Dichlorobenzene	ND		0.50	0.25	ug/L			01/15/16 23:24	1
1,2-Dichloroethane	ND		0.50	0.25	ug/L			01/15/16 23:24	1
1,2-Dichloropropane	ND		0.50	0.25	ug/L			01/15/16 23:24	1
1,3-Dichlorobenzene	ND		0.50	0.25	ug/L			01/15/16 23:24	1
1,3-Dichloropropane	ND		0.50	0.25	ug/L			01/15/16 23:24	1
1,4-Dichlorobenzene	ND		0.50	0.25	ug/L			01/15/16 23:24	1
2,2-Dichloropropane	ND		1.0	0.40	ug/L			01/15/16 23:24	1
2-Chlorotoluene	ND		0.50	0.25	ug/L			01/15/16 23:24	1
4-Chlorotoluene	ND		0.50	0.25	ug/L			01/15/16 23:24	1

Client Sample ID: MW-1
Date Collected: 01/13/16 13:10
Date Received: 01/13/16 18:00

Lab Sample ID: 440-134908-8
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.50	0.25	ug/L			01/15/16 23:24	1
Bromobenzene	ND		0.50	0.25	ug/L			01/15/16 23:24	1
Bromochloromethane	ND		0.50	0.25	ug/L			01/15/16 23:24	1
Bromodichloromethane	ND		0.50	0.25	ug/L			01/15/16 23:24	1
Bromoform	ND		1.0	0.40	ug/L			01/15/16 23:24	1
Bromomethane	ND		0.50	0.25	ug/L			01/15/16 23:24	1
Carbon tetrachloride	ND		0.50	0.25	ug/L			01/15/16 23:24	1
Chlorobenzene	ND		0.50	0.25	ug/L			01/15/16 23:24	1
Chloroethane	ND		1.0	0.40	ug/L			01/15/16 23:24	1
Chloroform	ND		0.50	0.25	ug/L			01/15/16 23:24	1
Chloromethane	ND		0.50	0.25	ug/L			01/15/16 23:24	1
cis-1,2-Dichloroethene	ND		0.50	0.25	ug/L			01/15/16 23:24	1
cis-1,3-Dichloropropene	ND		0.50	0.25	ug/L			01/15/16 23:24	1
Dibromochloromethane	ND		0.50	0.25	ug/L			01/15/16 23:24	1
Dibromomethane	ND		0.50	0.25	ug/L			01/15/16 23:24	1
Dichlorodifluoromethane	ND		0.50	0.25	ug/L			01/15/16 23:24	1
Isopropyl Ether (DIPE)	ND		0.50	0.25	ug/L			01/15/16 23:24	1
Ethyl-t-butyl ether (ETBE)	ND		0.50	0.25	ug/L			01/15/16 23:24	1
Hexachlorobutadiene	ND		0.50	0.25	ug/L			01/15/16 23:24	1
Isopropylbenzene	ND		0.50	0.25	ug/L			01/15/16 23:24	1
m,p-Xylene	ND		1.0	0.50	ug/L			01/15/16 23:24	1
Methylene Chloride	ND		2.0	0.88	ug/L			01/15/16 23:24	1
Methyl-t-Butyl Ether (MTBE)	ND		0.50	0.25	ug/L			01/15/16 23:24	1
Naphthalene	ND		1.0	0.40	ug/L			01/15/16 23:24	1
n-Butylbenzene	ND		1.0	0.40	ug/L			01/15/16 23:24	1
N-Propylbenzene	ND		0.50	0.25	ug/L			01/15/16 23:24	1
o-Xylene	ND		0.50	0.25	ug/L			01/15/16 23:24	1
p-Isopropyltoluene	ND		0.50	0.25	ug/L			01/15/16 23:24	1
sec-Butylbenzene	ND		0.50	0.25	ug/L			01/15/16 23:24	1
Styrene	ND		0.50	0.25	ug/L			01/15/16 23:24	1
Tert-amyl-methyl ether (TAME)	ND		0.50	0.25	ug/L			01/15/16 23:24	1
tert-Butyl alcohol (TBA)	ND		10	5.0	ug/L			01/15/16 23:24	1
tert-Butylbenzene	ND		0.50	0.25	ug/L			01/15/16 23:24	1
Tetrachloroethene	**4.4**		0.50	0.25	ug/L			01/15/16 23:24	1
Toluene	ND		0.50	0.25	ug/L			01/15/16 23:24	1
trans-1,2-Dichloroethene	ND		0.50	0.25	ug/L			01/15/16 23:24	1
trans-1,3-Dichloropropene	ND		0.50	0.25	ug/L			01/15/16 23:24	1
Trichloroethene	ND		0.50	0.25	ug/L			01/15/16 23:24	1
Trichlorofluoromethane	ND		0.50	0.25	ug/L			01/15/16 23:24	1
Vinyl chloride	ND		0.50	0.25	ug/L			01/15/16 23:24	1
Xylenes, Total	ND		1.0	0.50	ug/L			01/15/16 23:24	1
1,3,5-Trimethylbenzene	ND		0.50	0.25	ug/L			01/15/16 23:24	1
Ethylbenzene	ND		0.50	0.25	ug/L			01/15/16 23:24	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*92*		*80 - 120*		*01/15/16 23:24*	*1*
Dibromofluoromethane (Surr)	*100*		*76 - 132*		*01/15/16 23:24*	*1*
Toluene-d8 (Surr)	*95*		*80 - 128*		*01/15/16 23:24*	*1*

Method Summary

Client: Dudek & Associates
Project/Site: Reuland Electric

TestAmerica Job ID: 440-134908-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL IRV

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL IRV = TestAmerica Irvine, 17461 Derian Ave, Suite 100, Irvine, CA 92614-5817, TEL (949)261-1022

Lab Chronicle

Client: Dudek & Associates
Project/Site: Reuland Electric

TestAmerica Job ID: 440-134908-1

Client Sample ID: MW-9
Date Collected: 01/13/16 12:40
Date Received: 01/13/16 18:00

Lab Sample ID: 440-134908-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	10 mL	10 mL	305914	01/15/16 16:11	RM	TAL IRV

Client Sample ID: MW-8
Date Collected: 01/13/16 12:50
Date Received: 01/13/16 18:00

Lab Sample ID: 440-134908-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	10 mL	10 mL	305914	01/15/16 16:39	RM	TAL IRV

Client Sample ID: MW-8 DUPE
Date Collected: 01/13/16 12:55
Date Received: 01/13/16 18:00

Lab Sample ID: 440-134908-3
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	10 mL	10 mL	305914	01/15/16 17:07	RM	TAL IRV

Client Sample ID: TRIP BLANK
Date Collected: 01/13/16 15:50
Date Received: 01/13/16 18:00

Lab Sample ID: 440-134908-4
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	10 mL	10 mL	305914	01/15/16 17:34	RM	TAL IRV

Client Sample ID: MW-3
Date Collected: 01/13/16 15:50
Date Received: 01/13/16 18:00

Lab Sample ID: 440-134908-5
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	10 mL	10 mL	306116	01/15/16 20:52	WK	TAL IRV

Client Sample ID: MW-12
Date Collected: 01/13/16 16:00
Date Received: 01/13/16 18:00

Lab Sample ID: 440-134908-6
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	10 mL	10 mL	306116	01/15/16 22:23	WK	TAL IRV

Lab Chronicle

Client: Dudek & Associates
Project/Site: Reuland Electric

TestAmerica Job ID: 440-134908-1

Client Sample ID: MW-11

Date Collected: 01/13/16 16:10
Date Received: 01/13/16 18:00

Lab Sample ID: 440-134908-7
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	10 mL	10 mL	306116	01/15/16 22:53	WK	TAL IRV

Client Sample ID: MW-1

Date Collected: 01/13/16 13:10
Date Received: 01/13/16 18:00

Lab Sample ID: 440-134908-8
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	10 mL	10 mL	306116	01/15/16 23:24	WK	TAL IRV

Laboratory References:

TAL IRV = TestAmerica Irvine, 17461 Derian Ave, Suite 100, Irvine, CA 92614-5817, TEL (949)261-1022

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 440-305914/4
Matrix: Water
Analysis Batch: 305914

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	ND		0.50	0.25	ug/L			01/15/16 08:18	1
1,1,1-Trichloroethane	ND		0.50	0.25	ug/L			01/15/16 08:18	1
1,1,2,2-Tetrachloroethane	ND		0.50	0.25	ug/L			01/15/16 08:18	1
1,1,2-Trichloroethane	ND		0.50	0.25	ug/L			01/15/16 08:18	1
1,1-Dichloroethane	ND		0.50	0.25	ug/L			01/15/16 08:18	1
1,1-Dichloroethene	ND		0.50	0.25	ug/L			01/15/16 08:18	1
1,1-Dichloropropene	ND		0.50	0.25	ug/L			01/15/16 08:18	1
1,2,3-Trichlorobenzene	ND		1.0	0.40	ug/L			01/15/16 08:18	1
1,2,3-Trichloropropane	ND		0.50	0.25	ug/L			01/15/16 08:18	1
1,2,4-Trichlorobenzene	ND		1.0	0.40	ug/L			01/15/16 08:18	1
1,2,4-Trimethylbenzene	ND		0.50	0.25	ug/L			01/15/16 08:18	1
1,2-Dibromo-3-Chloropropane	ND		1.0	0.50	ug/L			01/15/16 08:18	1
1,2-Dibromoethane (EDB)	ND		0.50	0.25	ug/L			01/15/16 08:18	1
1,2-Dichlorobenzene	ND		0.50	0.25	ug/L			01/15/16 08:18	1
1,2-Dichloroethane	ND		0.50	0.25	ug/L			01/15/16 08:18	1
1,2-Dichloropropane	ND		0.50	0.25	ug/L			01/15/16 08:18	1
1,3-Dichlorobenzene	ND		0.50	0.25	ug/L			01/15/16 08:18	1
1,3-Dichloropropane	ND		0.50	0.25	ug/L			01/15/16 08:18	1
1,4-Dichlorobenzene	ND		0.50	0.25	ug/L			01/15/16 08:18	1
2,2-Dichloropropane	ND		1.0	0.40	ug/L			01/15/16 08:18	1
2-Chlorotoluene	ND		0.50	0.25	ug/L			01/15/16 08:18	1
4-Chlorotoluene	ND		0.50	0.25	ug/L			01/15/16 08:18	1
Benzene	ND		0.50	0.25	ug/L			01/15/16 08:18	1
Bromobenzene	ND		0.50	0.25	ug/L			01/15/16 08:18	1
Bromochloromethane	ND		0.50	0.25	ug/L			01/15/16 08:18	1
Bromodichloromethane	ND		0.50	0.25	ug/L			01/15/16 08:18	1
Bromoform	ND		1.0	0.40	ug/L			01/15/16 08:18	1
Bromomethane	ND		0.50	0.25	ug/L			01/15/16 08:18	1
Carbon tetrachloride	ND		0.50	0.25	ug/L			01/15/16 08:18	1
Chlorobenzene	ND		0.50	0.25	ug/L			01/15/16 08:18	1
Chloroethane	ND		1.0	0.40	ug/L			01/15/16 08:18	1
Chloroform	ND		0.50	0.25	ug/L			01/15/16 08:18	1
Chloromethane	ND		0.50	0.25	ug/L			01/15/16 08:18	1
cis-1,2-Dichloroethene	ND		0.50	0.25	ug/L			01/15/16 08:18	1
cis-1,3-Dichloropropene	ND		0.50	0.25	ug/L			01/15/16 08:18	1
Dibromochloromethane	ND		0.50	0.25	ug/L			01/15/16 08:18	1
Dibromomethane	ND		0.50	0.25	ug/L			01/15/16 08:18	1
Dichlorodifluoromethane	ND		0.50	0.25	ug/L			01/15/16 08:18	1
Isopropyl Ether (DIPE)	ND		0.50	0.25	ug/L			01/15/16 08:18	1
Ethyl-t-butyl ether (ETBE)	ND		0.50	0.25	ug/L			01/15/16 08:18	1
Hexachlorobutadiene	ND		0.50	0.25	ug/L			01/15/16 08:18	1
Isopropylbenzene	ND		0.50	0.25	ug/L			01/15/16 08:18	1
m,p-Xylene	ND		1.0	0.50	ug/L			01/15/16 08:18	1
Methylene Chloride	ND		2.0	0.88	ug/L			01/15/16 08:18	1
Methyl-t-Butyl Ether (MTBE)	ND		0.50	0.25	ug/L			01/15/16 08:18	1
Naphthalene	ND		1.0	0.40	ug/L			01/15/16 08:18	1
n-Butylbenzene	ND		1.0	0.40	ug/L			01/15/16 08:18	1
N-Propylbenzene	ND		0.50	0.25	ug/L			01/15/16 08:18	1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 440-305914/4
Matrix: Water
Analysis Batch: 305914

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
o-Xylene	ND		0.50	0.25	ug/L			01/15/16 08:18	1
p-Isopropyltoluene	ND		0.50	0.25	ug/L			01/15/16 08:18	1
sec-Butylbenzene	ND		0.50	0.25	ug/L			01/15/16 08:18	1
Styrene	ND		0.50	0.25	ug/L			01/15/16 08:18	1
Tert-amyl-methyl ether (TAME)	ND		0.50	0.25	ug/L			01/15/16 08:18	1
tert-Butyl alcohol (TBA)	ND		10	5.0	ug/L			01/15/16 08:18	1
tert-Butylbenzene	ND		0.50	0.25	ug/L			01/15/16 08:18	1
Tetrachloroethene	ND		0.50	0.25	ug/L			01/15/16 08:18	1
Toluene	ND		0.50	0.25	ug/L			01/15/16 08:18	1
trans-1,2-Dichloroethene	ND		0.50	0.25	ug/L			01/15/16 08:18	1
trans-1,3-Dichloropropene	ND		0.50	0.25	ug/L			01/15/16 08:18	1
Trichloroethene	ND		0.50	0.25	ug/L			01/15/16 08:18	1
Trichlorofluoromethane	ND		0.50	0.25	ug/L			01/15/16 08:18	1
Vinyl chloride	ND		0.50	0.25	ug/L			01/15/16 08:18	1
Xylenes, Total	ND		1.0	0.50	ug/L			01/15/16 08:18	1
1,3,5-Trimethylbenzene	ND		0.50	0.25	ug/L			01/15/16 08:18	1
Ethylbenzene	ND		0.50	0.25	ug/L			01/15/16 08:18	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*102*		*80 - 120*		*01/15/16 08:18*	*1*
Dibromofluoromethane (Surr)	*98*		*76 - 132*		*01/15/16 08:18*	*1*
Toluene-d8 (Surr)	*102*		*80 - 128*		*01/15/16 08:18*	*1*

Lab Sample ID: LCS 440-305914/5
Matrix: Water
Analysis Batch: 305914

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1,1,2-Tetrachloroethane	25.0	25.7		ug/L		103	60 - 141
1,1,1-Trichloroethane	25.0	24.8		ug/L		99	70 - 130
1,1,2,2-Tetrachloroethane	25.0	26.5		ug/L		106	63 - 130
1,1,2-Trichloroethane	25.0	25.5		ug/L		102	70 - 130
1,1-Dichloroethane	25.0	26.4		ug/L		105	64 - 130
1,1-Dichloroethene	25.0	26.2		ug/L		105	70 - 130
1,1-Dichloropropene	25.0	25.6		ug/L		102	70 - 130
1,2,3-Trichlorobenzene	25.0	23.4		ug/L		94	60 - 140
1,2,3-Trichloropropane	25.0	26.4		ug/L		105	63 - 130
1,2,4-Trichlorobenzene	25.0	25.9		ug/L		104	60 - 140
1,2,4-Trimethylbenzene	25.0	25.7		ug/L		103	70 - 135
1,2-Dibromo-3-Chloropropane	25.0	23.9		ug/L		96	52 - 140
1,2-Dibromoethane (EDB)	25.0	25.9		ug/L		104	70 - 130
1,2-Dichlorobenzene	25.0	26.2		ug/L		105	70 - 130
1,2-Dichloroethane	25.0	25.0		ug/L		100	57 - 138
1,2-Dichloropropane	25.0	28.7		ug/L		115	67 - 130
1,3-Dichlorobenzene	25.0	25.7		ug/L		103	70 - 130
1,3-Dichloropropane	25.0	26.0		ug/L		104	70 - 130
1,4-Dichlorobenzene	25.0	26.2		ug/L		105	70 - 130
2,2-Dichloropropane	25.0	26.6		ug/L		106	68 - 141

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 440-305914/5
Matrix: Water
Analysis Batch: 305914

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
2-Chlorotoluene	25.0	25.7		ug/L		103	70 - 130
4-Chlorotoluene	25.0	25.9		ug/L		103	70 - 130
Benzene	25.0	27.1		ug/L		108	68 - 130
Bromobenzene	25.0	25.6		ug/L		102	70 - 130
Bromochloromethane	25.0	27.1		ug/L		108	70 - 130
Bromodichloromethane	25.0	26.0		ug/L		104	70 - 132
Bromoform	25.0	28.3		ug/L		113	60 - 148
Bromomethane	25.0	22.9		ug/L		92	64 - 139
Carbon tetrachloride	25.0	26.5		ug/L		106	60 - 150
Chlorobenzene	25.0	24.7		ug/L		99	70 - 130
Chloroethane	25.0	23.7		ug/L		95	64 - 135
Chloroform	25.0	25.5		ug/L		102	70 - 130
Chloromethane	25.0	24.8		ug/L		99	47 - 140
cis-1,2-Dichloroethene	25.0	27.1		ug/L		108	70 - 133
cis-1,3-Dichloropropene	25.0	25.9		ug/L		104	70 - 133
Dibromochloromethane	25.0	25.0		ug/L		100	69 - 145
Dibromomethane	25.0	25.3		ug/L		101	70 - 130
Dichlorodifluoromethane	25.0	22.4		ug/L		90	29 - 150
Isopropyl Ether (DIPE)	25.0	29.6		ug/L		118	58 - 139
Ethyl-t-butyl ether (ETBE)	25.0	28.5		ug/L		114	60 - 136
Hexachlorobutadiene	25.0	23.6		ug/L		94	10 - 150
Isopropylbenzene	25.0	24.6		ug/L		98	70 - 136
m,p-Xylene	25.0	24.9		ug/L		100	70 - 130
Methylene Chloride	25.0	26.0		ug/L		104	52 - 130
Methyl-t-Butyl Ether (MTBE)	25.0	25.8		ug/L		103	63 - 131
Naphthalene	25.0	25.1		ug/L		100	60 - 140
n-Butylbenzene	25.0	26.4		ug/L		105	65 - 150
N-Propylbenzene	25.0	25.5		ug/L		102	67 - 139
o-Xylene	25.0	24.2		ug/L		97	70 - 130
p-Isopropyltoluene	25.0	26.2		ug/L		105	70 - 132
sec-Butylbenzene	25.0	25.0		ug/L		100	70 - 138
Styrene	25.0	26.9		ug/L		108	70 - 134
Tert-amyl-methyl ether (TAME)	25.0	26.2		ug/L		105	57 - 139
tert-Butyl alcohol (TBA)	250	274		ug/L		110	70 - 130
tert-Butylbenzene	25.0	25.0		ug/L		100	70 - 130
Tetrachloroethene	25.0	24.0		ug/L		96	70 - 130
Toluene	25.0	25.3		ug/L		101	70 - 130
trans-1,2-Dichloroethene	25.0	27.6		ug/L		111	70 - 130
trans-1,3-Dichloropropene	25.0	24.7		ug/L		99	70 - 132
Trichloroethene	25.0	26.8		ug/L		107	70 - 130
Trichlorofluoromethane	25.0	24.9		ug/L		100	60 - 150
Vinyl chloride	25.0	24.4		ug/L		98	59 - 133
1,3,5-Trimethylbenzene	25.0	25.7		ug/L		103	70 - 136
Ethylbenzene	25.0	24.8		ug/L		99	70 - 130

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*101*		*80 - 120*
Dibromofluoromethane (Surr)	*99*		*76 - 132*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 440-305914/5
Matrix: Water
Analysis Batch: 305914

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Surrogate	LCS %Recovery	LCS Qualifier	Limits
Toluene-d8 (Surr)	95		80 - 128

Lab Sample ID: 440-134607-C-2 MS
Matrix: Water
Analysis Batch: 305914

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1,1,2-Tetrachloroethane	ND		25.0	27.2		ug/L		109	60 - 149
1,1,1-Trichloroethane	ND		25.0	27.0		ug/L		108	70 - 130
1,1,2,2-Tetrachloroethane	ND		25.0	28.4		ug/L		114	63 - 130
1,1,2-Trichloroethane	ND		25.0	26.8		ug/L		107	70 - 130
1,1-Dichloroethane	ND		25.0	29.7		ug/L		119	65 - 130
1,1-Dichloroethene	1.3		25.0	30.0		ug/L		115	70 - 130
1,1-Dichloropropene	ND		25.0	27.6		ug/L		111	64 - 130
1,2,3-Trichlorobenzene	ND		25.0	25.3		ug/L		101	60 - 140
1,2,3-Trichloropropane	ND		25.0	28.1		ug/L		112	60 - 130
1,2,4-Trichlorobenzene	ND		25.0	26.8		ug/L		107	60 - 140
1,2,4-Trimethylbenzene	ND		25.0	26.7		ug/L		107	70 - 130
1,2-Dibromo-3-Chloropropane	ND		25.0	25.0		ug/L		100	48 - 140
1,2-Dibromoethane (EDB)	ND		25.0	27.3		ug/L		109	70 - 131
1,2-Dichlorobenzene	ND		25.0	27.7		ug/L		111	70 - 130
1,2-Dichloroethane	ND		25.0	27.8		ug/L		111	56 - 146
1,2-Dichloropropane	ND		25.0	32.4		ug/L		129	69 - 130
1,3-Dichlorobenzene	ND		25.0	27.0		ug/L		108	70 - 130
1,3-Dichloropropane	ND		25.0	27.4		ug/L		110	70 - 130
1,4-Dichlorobenzene	ND		25.0	27.5		ug/L		110	70 - 130
2,2-Dichloropropane	ND		25.0	29.0		ug/L		116	69 - 138
2-Chlorotoluene	ND		25.0	26.5		ug/L		106	70 - 130
4-Chlorotoluene	ND		25.0	27.1		ug/L		108	70 - 130
Benzene	ND		25.0	29.8		ug/L		119	66 - 130
Bromobenzene	ND		25.0	26.5		ug/L		106	70 - 130
Bromochloromethane	ND		25.0	29.9		ug/L		120	70 - 130
Bromodichloromethane	ND		25.0	28.5		ug/L		114	70 - 138
Bromoform	ND		25.0	29.6		ug/L		118	59 - 150
Bromomethane	ND		25.0	25.2		ug/L		101	62 - 131
Carbon tetrachloride	ND		25.0	28.4		ug/L		113	60 - 150
Chlorobenzene	ND		25.0	25.9		ug/L		104	70 - 130
Chloroethane	ND		25.0	26.0		ug/L		104	68 - 130
Chloroform	ND		25.0	28.7		ug/L		115	70 - 130
Chloromethane	ND		25.0	27.8		ug/L		111	39 - 144
cis-1,2-Dichloroethene	0.79		25.0	30.7		ug/L		120	70 - 130
cis-1,3-Dichloropropene	ND		25.0	27.0		ug/L		108	70 - 133
Dibromochloromethane	ND		25.0	26.2		ug/L		105	70 - 148
Dibromomethane	ND		25.0	27.4		ug/L		110	70 - 130
Dichlorodifluoromethane	ND		25.0	24.1		ug/L		96	25 - 142
Isopropyl Ether (DIPE)	ND		25.0	33.1		ug/L		132	64 - 138
Ethyl-t-butyl ether (ETBE)	ND		25.0	31.5		ug/L		126	70 - 130
Hexachlorobutadiene	ND		25.0	25.2		ug/L		101	10 - 150

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 440-134607-C-2 MS
Matrix: Water
Analysis Batch: 305914

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Isopropylbenzene	ND		25.0	25.7		ug/L		103	70 - 132
m,p-Xylene	ND		25.0	25.8		ug/L		103	70 - 133
Methylene Chloride	ND		25.0	29.7		ug/L		119	52 - 130
Methyl-t-Butyl Ether (MTBE)	ND		25.0	27.7		ug/L		111	70 - 130
Naphthalene	ND		25.0	26.2		ug/L		105	60 - 140
n-Butylbenzene	ND		25.0	27.7		ug/L		111	61 - 149
N-Propylbenzene	ND		25.0	26.3		ug/L		105	66 - 135
o-Xylene	ND		25.0	25.3		ug/L		101	70 - 133
p-Isopropyltoluene	ND		25.0	27.5		ug/L		110	70 - 130
sec-Butylbenzene	ND		25.0	26.3		ug/L		105	67 - 134
Styrene	ND		25.0	27.9		ug/L		112	29 - 150
Tert-amyl-methyl ether (TAME)	ND		25.0	27.9		ug/L		112	68 - 133
tert-Butyl alcohol (TBA)	ND		250	290		ug/L		116	70 - 130
tert-Butylbenzene	ND		25.0	26.1		ug/L		105	70 - 130
Tetrachloroethene	22		25.0	44.8		ug/L		93	70 - 137
Toluene	ND		25.0	26.4		ug/L		106	70 - 130
trans-1,2-Dichloroethene	ND		25.0	30.5		ug/L		122	70 - 130
trans-1,3-Dichloropropene	ND		25.0	26.0		ug/L		104	70 - 138
Trichloroethene	24		25.0	52.4		ug/L		114	70 - 130
Trichlorofluoromethane	ND		25.0	26.9		ug/L		108	60 - 150
Vinyl chloride	ND		25.0	27.9		ug/L		112	50 - 137
1,3,5-Trimethylbenzene	ND		25.0	26.6		ug/L		106	70 - 130
Ethylbenzene	ND		25.0	25.8		ug/L		103	70 - 130

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*100*		*80 - 120*
Dibromofluoromethane (Surr)	*101*		*76 - 132*
Toluene-d8 (Surr)	*92*		*80 - 128*

Lab Sample ID: 440-134607-C-2 MSD
Matrix: Water
Analysis Batch: 305914

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1,1,2-Tetrachloroethane	ND		25.0	27.1		ug/L		108	60 - 149	0	20
1,1,1-Trichloroethane	ND		25.0	27.1		ug/L		108	70 - 130	0	20
1,1,2,2-Tetrachloroethane	ND		25.0	29.2		ug/L		117	63 - 130	3	30
1,1,2-Trichloroethane	ND		25.0	27.0		ug/L		108	70 - 130	1	25
1,1-Dichloroethane	ND		25.0	29.9		ug/L		120	65 - 130	1	20
1,1-Dichloroethene	1.3		25.0	30.4		ug/L		117	70 - 130	1	20
1,1-Dichloropropene	ND		25.0	28.2		ug/L		113	64 - 130	2	20
1,2,3-Trichlorobenzene	ND		25.0	26.2		ug/L		105	60 - 140	3	20
1,2,3-Trichloropropane	ND		25.0	28.7		ug/L		115	60 - 130	2	30
1,2,4-Trichlorobenzene	ND		25.0	28.2		ug/L		113	60 - 140	5	20
1,2,4-Trimethylbenzene	ND		25.0	27.3		ug/L		109	70 - 130	2	25
1,2-Dibromo-3-Chloropropane	ND		25.0	26.5		ug/L		106	48 - 140	6	30
1,2-Dibromoethane (EDB)	ND		25.0	27.4		ug/L		110	70 - 131	0	25
1,2-Dichlorobenzene	ND		25.0	28.1		ug/L		113	70 - 130	2	20

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 440-134607-C-2 MSD
Matrix: Water
Analysis Batch: 305914

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,2-Dichloroethane	ND		25.0	27.8		ug/L		111	56 - 146	0	20
1,2-Dichloropropane	ND		25.0	32.6		ug/L		130	69 - 130	1	20
1,3-Dichlorobenzene	ND		25.0	27.4		ug/L		110	70 - 130	2	20
1,3-Dichloropropane	ND		25.0	27.5		ug/L		110	70 - 130	1	25
1,4-Dichlorobenzene	ND		25.0	28.3		ug/L		113	70 - 130	3	20
2,2-Dichloropropane	ND		25.0	29.6		ug/L		118	69 - 138	2	25
2-Chlorotoluene	ND		25.0	27.0		ug/L		108	70 - 130	2	20
4-Chlorotoluene	ND		25.0	27.4		ug/L		110	70 - 130	1	20
Benzene	ND		25.0	30.1		ug/L		120	66 - 130	1	20
Bromobenzene	ND		25.0	27.2		ug/L		109	70 - 130	2	20
Bromochloromethane	ND		25.0	29.9		ug/L		120	70 - 130	0	25
Bromodichloromethane	ND		25.0	29.1		ug/L		116	70 - 138	2	20
Bromoform	ND		25.0	30.6		ug/L		123	59 - 150	3	25
Bromomethane	ND		25.0	24.9		ug/L		100	62 - 131	1	25
Carbon tetrachloride	ND		25.0	28.9		ug/L		115	60 - 150	2	25
Chlorobenzene	ND		25.0	25.7		ug/L		103	70 - 130	1	20
Chloroethane	ND		25.0	25.6		ug/L		102	68 - 130	2	25
Chloroform	ND		25.0	28.4		ug/L		114	70 - 130	1	20
Chloromethane	ND		25.0	26.8		ug/L		107	39 - 144	4	25
cis-1,2-Dichloroethene	0.79		25.0	30.8		ug/L		120	70 - 130	0	20
cis-1,3-Dichloropropene	ND		25.0	27.7		ug/L		111	70 - 133	2	20
Dibromochloromethane	ND		25.0	26.2		ug/L		105	70 - 148	0	25
Dibromomethane	ND		25.0	28.0		ug/L		112	70 - 130	2	25
Dichlorodifluoromethane	ND		25.0	23.8		ug/L		95	25 - 142	1	30
Isopropyl Ether (DIPE)	ND		25.0	33.1		ug/L		132	64 - 138	0	25
Ethyl-t-butyl ether (ETBE)	ND		25.0	31.8		ug/L		127	70 - 130	1	25
Hexachlorobutadiene	ND		25.0	25.9		ug/L		103	10 - 150	3	20
Isopropylbenzene	ND		25.0	25.6		ug/L		102	70 - 132	0	20
m,p-Xylene	ND		25.0	25.7		ug/L		103	70 - 133	0	25
Methylene Chloride	ND		25.0	29.6		ug/L		118	52 - 130	0	20
Methyl-t-Butyl Ether (MTBE)	ND		25.0	28.5		ug/L		114	70 - 130	3	25
Naphthalene	ND		25.0	28.0		ug/L		112	60 - 140	6	30
n-Butylbenzene	ND		25.0	28.3		ug/L		113	61 - 149	2	20
N-Propylbenzene	ND		25.0	27.1		ug/L		109	66 - 135	3	20
o-Xylene	ND		25.0	25.1		ug/L		100	70 - 133	1	20
p-Isopropyltoluene	ND		25.0	28.0		ug/L		112	70 - 130	2	20
sec-Butylbenzene	ND		25.0	26.8		ug/L		107	67 - 134	2	20
Styrene	ND		25.0	27.9		ug/L		112	29 - 150	0	35
Tert-amyl-methyl ether (TAME)	ND		25.0	28.7		ug/L		115	68 - 133	3	30
tert-Butyl alcohol (TBA)	ND		250	283		ug/L		113	70 - 130	2	25
tert-Butylbenzene	ND		25.0	26.6		ug/L		106	70 - 130	2	20
Tetrachloroethene	22		25.0	44.7		ug/L		92	70 - 137	0	20
Toluene	ND		25.0	26.3		ug/L		105	70 - 130	0	20
trans-1,2-Dichloroethene	ND		25.0	30.5		ug/L		122	70 - 130	0	20
trans-1,3-Dichloropropene	ND		25.0	26.1		ug/L		105	70 - 138	1	25
Trichloroethene	24		25.0	52.9		ug/L		116	70 - 130	1	20
Trichlorofluoromethane	ND		25.0	26.7		ug/L		107	60 - 150	1	25
Vinyl chloride	ND		25.0	27.0		ug/L		108	50 - 137	3	30

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 440-134607-C-2 MSD
Matrix: Water
Analysis Batch: 305914

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,3,5-Trimethylbenzene	ND		25.0	27.1		ug/L		108	70 - 130	2	20
Ethylbenzene	ND		25.0	25.8		ug/L		103	70 - 130	0	20

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*101*		*80 - 120*
Dibromofluoromethane (Surr)	*101*		*76 - 132*
Toluene-d8 (Surr)	*92*		*80 - 128*

Lab Sample ID: MB 440-306116/4
Matrix: Water
Analysis Batch: 306116

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	ND		0.50	0.25	ug/L			01/15/16 19:22	1
1,1,1-Trichloroethane	ND		0.50	0.25	ug/L			01/15/16 19:22	1
1,1,2,2-Tetrachloroethane	ND		0.50	0.25	ug/L			01/15/16 19:22	1
1,1,2-Trichloroethane	ND		0.50	0.25	ug/L			01/15/16 19:22	1
1,1-Dichloroethane	ND		0.50	0.25	ug/L			01/15/16 19:22	1
1,1-Dichloroethene	ND		0.50	0.25	ug/L			01/15/16 19:22	1
1,1-Dichloropropene	ND		0.50	0.25	ug/L			01/15/16 19:22	1
1,2,3-Trichlorobenzene	ND		1.0	0.40	ug/L			01/15/16 19:22	1
1,2,3-Trichloropropane	ND		0.50	0.25	ug/L			01/15/16 19:22	1
1,2,4-Trichlorobenzene	ND		1.0	0.40	ug/L			01/15/16 19:22	1
1,2,4-Trimethylbenzene	ND		0.50	0.25	ug/L			01/15/16 19:22	1
1,2-Dibromo-3-Chloropropane	ND		1.0	0.50	ug/L			01/15/16 19:22	1
1,2-Dibromoethane (EDB)	ND		0.50	0.25	ug/L			01/15/16 19:22	1
1,2-Dichlorobenzene	ND		0.50	0.25	ug/L			01/15/16 19:22	1
1,2-Dichloroethane	ND		0.50	0.25	ug/L			01/15/16 19:22	1
1,2-Dichloropropane	ND		0.50	0.25	ug/L			01/15/16 19:22	1
1,3-Dichlorobenzene	ND		0.50	0.25	ug/L			01/15/16 19:22	1
1,3-Dichloropropane	ND		0.50	0.25	ug/L			01/15/16 19:22	1
1,4-Dichlorobenzene	ND		0.50	0.25	ug/L			01/15/16 19:22	1
2,2-Dichloropropane	ND		1.0	0.40	ug/L			01/15/16 19:22	1
2-Chlorotoluene	ND		0.50	0.25	ug/L			01/15/16 19:22	1
4-Chlorotoluene	ND		0.50	0.25	ug/L			01/15/16 19:22	1
Benzene	ND		0.50	0.25	ug/L			01/15/16 19:22	1
Bromobenzene	ND		0.50	0.25	ug/L			01/15/16 19:22	1
Bromochloromethane	ND		0.50	0.25	ug/L			01/15/16 19:22	1
Bromodichloromethane	ND		0.50	0.25	ug/L			01/15/16 19:22	1
Bromoform	ND		1.0	0.40	ug/L			01/15/16 19:22	1
Bromomethane	ND		0.50	0.25	ug/L			01/15/16 19:22	1
Carbon tetrachloride	ND		0.50	0.25	ug/L			01/15/16 19:22	1
Chlorobenzene	ND		0.50	0.25	ug/L			01/15/16 19:22	1
Chloroethane	ND		1.0	0.40	ug/L			01/15/16 19:22	1
Chloroform	ND		0.50	0.25	ug/L			01/15/16 19:22	1
Chloromethane	ND		0.50	0.25	ug/L			01/15/16 19:22	1
cis-1,2-Dichloroethene	ND		0.50	0.25	ug/L			01/15/16 19:22	1
cis-1,3-Dichloropropene	ND		0.50	0.25	ug/L			01/15/16 19:22	1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 440-306116/4
Matrix: Water
Analysis Batch: 306116

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dibromochloromethane	ND		0.50	0.25	ug/L			01/15/16 19:22	1
Dibromomethane	ND		0.50	0.25	ug/L			01/15/16 19:22	1
Dichlorodifluoromethane	ND		0.50	0.25	ug/L			01/15/16 19:22	1
Isopropyl Ether (DIPE)	ND		0.50	0.25	ug/L			01/15/16 19:22	1
Ethyl-t-butyl ether (ETBE)	ND		0.50	0.25	ug/L			01/15/16 19:22	1
Hexachlorobutadiene	ND		0.50	0.25	ug/L			01/15/16 19:22	1
Isopropylbenzene	ND		0.50	0.25	ug/L			01/15/16 19:22	1
m,p-Xylene	ND		1.0	0.50	ug/L			01/15/16 19:22	1
Methylene Chloride	ND		2.0	0.88	ug/L			01/15/16 19:22	1
Methyl-t-Butyl Ether (MTBE)	ND		0.50	0.25	ug/L			01/15/16 19:22	1
Naphthalene	ND		1.0	0.40	ug/L			01/15/16 19:22	1
n-Butylbenzene	ND		1.0	0.40	ug/L			01/15/16 19:22	1
N-Propylbenzene	ND		0.50	0.25	ug/L			01/15/16 19:22	1
o-Xylene	ND		0.50	0.25	ug/L			01/15/16 19:22	1
p-Isopropyltoluene	ND		0.50	0.25	ug/L			01/15/16 19:22	1
sec-Butylbenzene	ND		0.50	0.25	ug/L			01/15/16 19:22	1
Styrene	ND		0.50	0.25	ug/L			01/15/16 19:22	1
Tert-amyl-methyl ether (TAME)	ND		0.50	0.25	ug/L			01/15/16 19:22	1
tert-Butyl alcohol (TBA)	ND		10	5.0	ug/L			01/15/16 19:22	1
tert-Butylbenzene	ND		0.50	0.25	ug/L			01/15/16 19:22	1
Tetrachloroethene	ND		0.50	0.25	ug/L			01/15/16 19:22	1
Toluene	ND		0.50	0.25	ug/L			01/15/16 19:22	1
trans-1,2-Dichloroethene	ND		0.50	0.25	ug/L			01/15/16 19:22	1
trans-1,3-Dichloropropene	ND		0.50	0.25	ug/L			01/15/16 19:22	1
Trichloroethene	ND		0.50	0.25	ug/L			01/15/16 19:22	1
Trichlorofluoromethane	ND		0.50	0.25	ug/L			01/15/16 19:22	1
Vinyl chloride	ND		0.50	0.25	ug/L			01/15/16 19:22	1
Xylenes, Total	ND		1.0	0.50	ug/L			01/15/16 19:22	1
1,3,5-Trimethylbenzene	ND		0.50	0.25	ug/L			01/15/16 19:22	1
Ethylbenzene	ND		0.50	0.25	ug/L			01/15/16 19:22	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*93*		*80 - 120*		*01/15/16 19:22*	*1*
Dibromofluoromethane (Surr)	*99*		*76 - 132*		*01/15/16 19:22*	*1*
Toluene-d8 (Surr)	*98*		*80 - 128*		*01/15/16 19:22*	*1*

Lab Sample ID: LCS 440-306116/5
Matrix: Water
Analysis Batch: 306116

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1,1,2-Tetrachloroethane	25.0	29.3		ug/L		117	60 - 141
1,1,1-Trichloroethane	25.0	29.3		ug/L		117	70 - 130
1,1,2,2-Tetrachloroethane	25.0	25.0		ug/L		100	63 - 130
1,1,2-Trichloroethane	25.0	24.8		ug/L		99	70 - 130
1,1-Dichloroethane	25.0	22.6		ug/L		91	64 - 130
1,1-Dichloroethene	25.0	23.7		ug/L		95	70 - 130
1,1-Dichloropropene	25.0	26.6		ug/L		106	70 - 130

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 440-306116/5
Matrix: Water
Analysis Batch: 306116

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,2,3-Trichlorobenzene	25.0	27.1		ug/L		108	60 - 140
1,2,3-Trichloropropane	25.0	23.9		ug/L		96	63 - 130
1,2,4-Trichlorobenzene	25.0	28.1		ug/L		112	60 - 140
1,2,4-Trimethylbenzene	25.0	27.0		ug/L		108	70 - 135
1,2-Dibromo-3-Chloropropane	25.0	23.6		ug/L		95	52 - 140
1,2-Dibromoethane (EDB)	25.0	28.2		ug/L		113	70 - 130
1,2-Dichlorobenzene	25.0	27.4		ug/L		110	70 - 130
1,2-Dichloroethane	25.0	25.4		ug/L		101	57 - 138
1,2-Dichloropropane	25.0	24.4		ug/L		97	67 - 130
1,3-Dichlorobenzene	25.0	25.5		ug/L		102	70 - 130
1,3-Dichloropropane	25.0	24.6		ug/L		98	70 - 130
1,4-Dichlorobenzene	25.0	25.2		ug/L		101	70 - 130
2,2-Dichloropropane	25.0	33.7		ug/L		135	68 - 141
2-Chlorotoluene	25.0	25.0		ug/L		100	70 - 130
4-Chlorotoluene	25.0	25.3		ug/L		101	70 - 130
Benzene	25.0	24.8		ug/L		99	68 - 130
Bromobenzene	25.0	28.4		ug/L		114	70 - 130
Bromochloromethane	25.0	28.2		ug/L		113	70 - 130
Bromodichloromethane	25.0	26.5		ug/L		106	70 - 132
Bromoform	25.0	30.2		ug/L		121	60 - 148
Bromomethane	25.0	28.7		ug/L		115	64 - 139
Carbon tetrachloride	25.0	29.1		ug/L		117	60 - 150
Chlorobenzene	25.0	23.2		ug/L		93	70 - 130
Chloroethane	25.0	25.3		ug/L		101	64 - 135
Chloroform	25.0	26.6		ug/L		106	70 - 130
Chloromethane	25.0	24.5		ug/L		98	47 - 140
cis-1,2-Dichloroethene	25.0	26.4		ug/L		105	70 - 133
cis-1,3-Dichloropropene	25.0	27.4		ug/L		110	70 - 133
Dibromochloromethane	25.0	28.2		ug/L		113	69 - 145
Dibromomethane	25.0	26.6		ug/L		107	70 - 130
Dichlorodifluoromethane	25.0	28.6		ug/L		114	29 - 150
Isopropyl Ether (DIPE)	25.0	22.7		ug/L		91	58 - 139
Ethyl-t-butyl ether (ETBE)	25.0	24.4		ug/L		98	60 - 136
Hexachlorobutadiene	25.0	27.9		ug/L		112	10 - 150
Isopropylbenzene	25.0	28.3		ug/L		113	70 - 136
m,p-Xylene	25.0	27.1		ug/L		108	70 - 130
Methylene Chloride	25.0	24.2		ug/L		97	52 - 130
Methyl-t-Butyl Ether (MTBE)	25.0	26.2		ug/L		105	63 - 131
Naphthalene	25.0	28.5		ug/L		114	60 - 140
n-Butylbenzene	25.0	26.0		ug/L		104	65 - 150
N-Propylbenzene	25.0	26.7		ug/L		107	67 - 139
o-Xylene	25.0	25.6		ug/L		103	70 - 130
p-Isopropyltoluene	25.0	26.8		ug/L		107	70 - 132
sec-Butylbenzene	25.0	26.7		ug/L		107	70 - 138
Styrene	25.0	27.1		ug/L		108	70 - 134
Tert-amyl-methyl ether (TAME)	25.0	26.1		ug/L		104	57 - 139
tert-Butyl alcohol (TBA)	250	273		ug/L		109	70 - 130
tert-Butylbenzene	25.0	27.8		ug/L		111	70 - 130

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 440-306116/5
Matrix: Water
Analysis Batch: 306116

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Tetrachloroethene	25.0	28.6		ug/L		114	70 - 130
Toluene	25.0	26.1		ug/L		104	70 - 130
trans-1,2-Dichloroethene	25.0	26.7		ug/L		107	70 - 130
trans-1,3-Dichloropropene	25.0	26.8		ug/L		107	70 - 132
Trichloroethene	25.0	28.7		ug/L		115	70 - 130
Trichlorofluoromethane	25.0	28.9		ug/L		116	60 - 150
Vinyl chloride	25.0	27.6		ug/L		110	59 - 133
1,3,5-Trimethylbenzene	25.0	26.9		ug/L		108	70 - 136
Ethylbenzene	25.0	26.1		ug/L		104	70 - 130

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*93*		*80 - 120*
Dibromofluoromethane (Surr)	*98*		*76 - 132*
Toluene-d8 (Surr)	*96*		*80 - 128*

Lab Sample ID: 440-134908-5 MS
Matrix: Water
Analysis Batch: 306116

Client Sample ID: MW-3
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1,1,2-Tetrachloroethane	ND		25.0	28.4		ug/L		114	60 - 149
1,1,1-Trichloroethane	ND		25.0	29.0		ug/L		116	70 - 130
1,1,2,2-Tetrachloroethane	ND		25.0	25.8		ug/L		103	63 - 130
1,1,2-Trichloroethane	ND		25.0	24.6		ug/L		98	70 - 130
1,1-Dichloroethane	ND		25.0	22.5		ug/L		90	65 - 130
1,1-Dichloroethene	ND		25.0	24.4		ug/L		97	70 - 130
1,1-Dichloropropene	ND		25.0	26.6		ug/L		106	64 - 130
1,2,3-Trichlorobenzene	ND		25.0	26.0		ug/L		104	60 - 140
1,2,3-Trichloropropane	ND		25.0	25.2		ug/L		101	60 - 130
1,2,4-Trichlorobenzene	ND		25.0	27.0		ug/L		108	60 - 140
1,2,4-Trimethylbenzene	ND		25.0	26.5		ug/L		106	70 - 130
1,2-Dibromo-3-Chloropropane	ND		25.0	24.9		ug/L		100	48 - 140
1,2-Dibromoethane (EDB)	ND		25.0	28.1		ug/L		112	70 - 131
1,2-Dichlorobenzene	ND		25.0	26.4		ug/L		106	70 - 130
1,2-Dichloroethane	ND		25.0	24.9		ug/L		99	56 - 146
1,2-Dichloropropane	ND		25.0	23.2		ug/L		93	69 - 130
1,3-Dichlorobenzene	ND		25.0	25.0		ug/L		100	70 - 130
1,3-Dichloropropane	ND		25.0	24.5		ug/L		98	70 - 130
1,4-Dichlorobenzene	ND		25.0	24.6		ug/L		98	70 - 130
2,2-Dichloropropane	ND	F1	25.0	35.2	F1	ug/L		141	69 - 138
2-Chlorotoluene	ND		25.0	24.7		ug/L		99	70 - 130
4-Chlorotoluene	ND		25.0	24.7		ug/L		99	70 - 130
Benzene	ND		25.0	24.4		ug/L		98	66 - 130
Bromobenzene	ND		25.0	27.4		ug/L		110	70 - 130
Bromochloromethane	ND		25.0	26.9		ug/L		108	70 - 130
Bromodichloromethane	ND		25.0	25.6		ug/L		102	70 - 138
Bromoform	ND		25.0	30.3		ug/L		121	59 - 150
Bromomethane	ND		25.0	28.6		ug/L		114	62 - 131

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 440-134908-5 MS
Matrix: Water
Analysis Batch: 306116

Client Sample ID: MW-3
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Carbon tetrachloride	ND		25.0	29.5		ug/L		118	60 - 150
Chlorobenzene	ND		25.0	23.0		ug/L		92	70 - 130
Chloroethane	ND		25.0	25.9		ug/L		104	68 - 130
Chloroform	ND		25.0	26.0		ug/L		104	70 - 130
Chloromethane	ND		25.0	24.2		ug/L		97	39 - 144
cis-1,2-Dichloroethene	ND		25.0	25.5		ug/L		102	70 - 130
cis-1,3-Dichloropropene	ND		25.0	27.2		ug/L		109	70 - 133
Dibromochloromethane	ND		25.0	28.2		ug/L		113	70 - 148
Dibromomethane	ND		25.0	26.8		ug/L		107	70 - 130
Dichlorodifluoromethane	ND		25.0	27.1		ug/L		108	25 - 142
Isopropyl Ether (DIPE)	ND		25.0	21.8		ug/L		87	64 - 138
Ethyl-t-butyl ether (ETBE)	ND		25.0	24.5		ug/L		98	70 - 130
Hexachlorobutadiene	ND		25.0	27.6		ug/L		110	10 - 150
Isopropylbenzene	ND		25.0	28.4		ug/L		114	70 - 132
m,p-Xylene	ND		25.0	27.3		ug/L		109	70 - 133
Methylene Chloride	ND		25.0	23.9		ug/L		96	52 - 130
Methyl-t-Butyl Ether (MTBE)	ND		25.0	26.7		ug/L		107	70 - 130
Naphthalene	ND		25.0	27.9		ug/L		112	60 - 140
n-Butylbenzene	ND		25.0	25.7		ug/L		103	61 - 149
N-Propylbenzene	ND		25.0	26.3		ug/L		105	66 - 135
o-Xylene	ND		25.0	26.2		ug/L		105	70 - 133
p-Isopropyltoluene	ND		25.0	26.4		ug/L		106	70 - 130
sec-Butylbenzene	ND		25.0	26.4		ug/L		106	67 - 134
Styrene	ND		25.0	26.3		ug/L		105	29 - 150
Tert-amyl-methyl ether (TAME)	ND		25.0	26.5		ug/L		106	68 - 133
tert-Butyl alcohol (TBA)	ND		250	260		ug/L		104	70 - 130
tert-Butylbenzene	ND		25.0	27.5		ug/L		110	70 - 130
Tetrachloroethene	8.5		25.0	36.1		ug/L		110	70 - 137
Toluene	ND		25.0	25.9		ug/L		104	70 - 130
trans-1,2-Dichloroethene	ND		25.0	26.4		ug/L		105	70 - 130
trans-1,3-Dichloropropene	ND		25.0	26.4		ug/L		106	70 - 138
Trichloroethene	ND		25.0	28.0		ug/L		112	70 - 130
Trichlorofluoromethane	ND		25.0	29.3		ug/L		117	60 - 150
Vinyl chloride	ND		25.0	27.8		ug/L		111	50 - 137
1,3,5-Trimethylbenzene	ND		25.0	26.5		ug/L		106	70 - 130
Ethylbenzene	ND		25.0	26.0		ug/L		104	70 - 130

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*91*		*80 - 120*
Dibromofluoromethane (Surr)	*97*		*76 - 132*
Toluene-d8 (Surr)	*96*		*80 - 128*

Lab Sample ID: 440-134908-5 MSD
Matrix: Water
Analysis Batch: 306116

Client Sample ID: MW-3
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1,1,2-Tetrachloroethane	ND		25.0	28.8		ug/L		115	60 - 149	1	20

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 440-134908-5 MSD
Matrix: Water
Analysis Batch: 306116

Client Sample ID: MW-3
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1,1-Trichloroethane	ND		25.0	29.4		ug/L		118	70 - 130	1	20
1,1,2,2-Tetrachloroethane	ND		25.0	24.5		ug/L		98	63 - 130	5	30
1,1,2-Trichloroethane	ND		25.0	24.9		ug/L		100	70 - 130	1	25
1,1-Dichloroethane	ND		25.0	22.5		ug/L		90	65 - 130	0	20
1,1-Dichloroethene	ND		25.0	24.4		ug/L		97	70 - 130	0	20
1,1-Dichloropropene	ND		25.0	26.9		ug/L		108	64 - 130	1	20
1,2,3-Trichlorobenzene	ND		25.0	26.5		ug/L		106	60 - 140	2	20
1,2,3-Trichloropropane	ND		25.0	24.2		ug/L		97	60 - 130	4	30
1,2,4-Trichlorobenzene	ND		25.0	27.6		ug/L		111	60 - 140	3	20
1,2,4-Trimethylbenzene	ND		25.0	26.6		ug/L		106	70 - 130	0	25
1,2-Dibromo-3-Chloropropane	ND		25.0	23.4		ug/L		94	48 - 140	6	30
1,2-Dibromoethane (EDB)	ND		25.0	28.3		ug/L		113	70 - 131	1	25
1,2-Dichlorobenzene	ND		25.0	26.6		ug/L		107	70 - 130	1	20
1,2-Dichloroethane	ND		25.0	24.8		ug/L		99	56 - 146	0	20
1,2-Dichloropropane	ND		25.0	23.8		ug/L		95	69 - 130	3	20
1,3-Dichlorobenzene	ND		25.0	25.1		ug/L		100	70 - 130	0	20
1,3-Dichloropropane	ND		25.0	24.1		ug/L		96	70 - 130	1	25
1,4-Dichlorobenzene	ND		25.0	25.1		ug/L		100	70 - 130	2	20
2,2-Dichloropropane	ND	F1	25.0	34.6		ug/L		138	69 - 138	2	25
2-Chlorotoluene	ND		25.0	25.0		ug/L		100	70 - 130	1	20
4-Chlorotoluene	ND		25.0	25.1		ug/L		100	70 - 130	1	20
Benzene	ND		25.0	24.6		ug/L		98	66 - 130	1	20
Bromobenzene	ND		25.0	28.1		ug/L		112	70 - 130	2	20
Bromochloromethane	ND		25.0	27.2		ug/L		109	70 - 130	1	25
Bromodichloromethane	ND		25.0	26.2		ug/L		105	70 - 138	2	20
Bromoform	ND		25.0	29.2		ug/L		117	59 - 150	4	25
Bromomethane	ND		25.0	28.5		ug/L		114	62 - 131	0	25
Carbon tetrachloride	ND		25.0	29.9		ug/L		120	60 - 150	1	25
Chlorobenzene	ND		25.0	23.2		ug/L		93	70 - 130	1	20
Chloroethane	ND		25.0	26.0		ug/L		104	68 - 130	0	25
Chloroform	ND		25.0	26.1		ug/L		104	70 - 130	0	20
Chloromethane	ND		25.0	23.8		ug/L		95	39 - 144	1	25
cis-1,2-Dichloroethene	ND		25.0	26.4		ug/L		105	70 - 130	3	20
cis-1,3-Dichloropropene	ND		25.0	26.8		ug/L		107	70 - 133	2	20
Dibromochloromethane	ND		25.0	28.1		ug/L		112	70 - 148	0	25
Dibromomethane	ND		25.0	25.3		ug/L		101	70 - 130	6	25
Dichlorodifluoromethane	ND		25.0	28.3		ug/L		113	25 - 142	4	30
Isopropyl Ether (DIPE)	ND		25.0	22.3		ug/L		89	64 - 138	2	25
Ethyl-t-butyl ether (ETBE)	ND		25.0	24.4		ug/L		98	70 - 130	0	25
Hexachlorobutadiene	ND		25.0	28.3		ug/L		113	10 - 150	2	20
Isopropylbenzene	ND		25.0	28.6		ug/L		114	70 - 132	1	20
m,p-Xylene	ND		25.0	27.2		ug/L		109	70 - 133	0	25
Methylene Chloride	ND		25.0	24.1		ug/L		97	52 - 130	1	20
Methyl-t-Butyl Ether (MTBE)	ND		25.0	26.5		ug/L		106	70 - 130	1	25
Naphthalene	ND		25.0	27.2		ug/L		109	60 - 140	3	30
n-Butylbenzene	ND		25.0	26.4		ug/L		105	61 - 149	3	20
N-Propylbenzene	ND		25.0	27.0		ug/L		108	66 - 135	2	20
o-Xylene	ND		25.0	26.4		ug/L		106	70 - 133	1	20

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 440-134908-5 MSD
Matrix: Water
Analysis Batch: 306116

Client Sample ID: MW-3
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
p-Isopropyltoluene	ND		25.0	26.8		ug/L		107	70 - 130	1	20
sec-Butylbenzene	ND		25.0	26.8		ug/L		107	67 - 134	1	20
Styrene	ND		25.0	26.1		ug/L		105	29 - 150	1	35
Tert-amyl-methyl ether (TAME)	ND		25.0	27.1		ug/L		108	68 - 133	2	30
tert-Butyl alcohol (TBA)	ND		250	265		ug/L		106	70 - 130	2	25
tert-Butylbenzene	ND		25.0	27.9		ug/L		112	70 - 130	2	20
Tetrachloroethene	8.5		25.0	35.2		ug/L		107	70 - 137	3	20
Toluene	ND		25.0	25.5		ug/L		102	70 - 130	2	20
trans-1,2-Dichloroethene	ND		25.0	25.8		ug/L		103	70 - 130	2	20
trans-1,3-Dichloropropene	ND		25.0	27.3		ug/L		109	70 - 138	3	25
Trichloroethene	ND		25.0	28.1		ug/L		112	70 - 130	0	20
Trichlorofluoromethane	ND		25.0	29.3		ug/L		117	60 - 150	0	25
Vinyl chloride	ND		25.0	28.2		ug/L		113	50 - 137	2	30
1,3,5-Trimethylbenzene	ND		25.0	27.1		ug/L		108	70 - 130	2	20
Ethylbenzene	ND		25.0	26.4		ug/L		106	70 - 130	2	20

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*93*		*80 - 120*
Dibromofluoromethane (Surr)	*97*		*76 - 132*
Toluene-d8 (Surr)	*96*		*80 - 128*

QC Association Summary

Client: Dudek & Associates
Project/Site: Reuland Electric

TestAmerica Job ID: 440-134908-1

GC/MS VOA

Analysis Batch: 305914

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-134607-C-2 MS	Matrix Spike	Total/NA	Water	8260B	
440-134607-C-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	
440-134908-1	MW-9	Total/NA	Water	8260B	
440-134908-2	MW-8	Total/NA	Water	8260B	
440-134908-3	MW-8 DUPE	Total/NA	Water	8260B	
440-134908-4	TRIP BLANK	Total/NA	Water	8260B	
LCS 440-305914/5	Lab Control Sample	Total/NA	Water	8260B	
MB 440-305914/4	Method Blank	Total/NA	Water	8260B	

Analysis Batch: 306116

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-134908-5	MW-3	Total/NA	Water	8260B	
440-134908-5 MS	MW-3	Total/NA	Water	8260B	
440-134908-5 MSD	MW-3	Total/NA	Water	8260B	
440-134908-6	MW-12	Total/NA	Water	8260B	
440-134908-7	MW-11	Total/NA	Water	8260B	
440-134908-8	MW-1	Total/NA	Water	8260B	
LCS 440-306116/5	Lab Control Sample	Total/NA	Water	8260B	
MB 440-306116/4	Method Blank	Total/NA	Water	8260B	

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
F1	MS and/or MSD Recovery is outside acceptance limits.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Certification Summary

Client: Dudek & Associates
Project/Site: Reuland Electric

TestAmerica Job ID: 440-134908-1

Laboratory: TestAmerica Irvine

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Alaska	State Program	10	CA01531	06-30-16
Arizona	State Program	9	AZ0671	10-13-16
California	LA Cty Sanitation Districts	9	10256	01-31-17 *
California	State Program	9	2706	06-30-16
Guam	State Program	9	Cert. No. 12.002r	01-23-16 *
Hawaii	State Program	9	N/A	01-29-17
Kansas	NELAP Secondary AB	7	E-10420	07-31-16
Nevada	State Program	9	CA015312007A	07-31-16
New Mexico	State Program	6	N/A	01-29-16 *
Northern Mariana Islands	State Program	9	MP0002	01-29-16 *
Oregon	NELAP	10	4005	01-29-16 *
USDA	Federal		P330-09-00080	07-08-18
Washington	State Program	10	900	09-03-16

* Certification renewal pending - certification considered valid.

TestAmerica Irvine

17461 Derian Ave
Suite 100
Irvine, CA 92614
Phone: 949.261.1022 Fax:

Chain of Custody Record

069438

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
TestAmerica Laboratories, Inc.
TAL-8210 (0713)

Regulatory Program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other:

Client Contact	Project Manager: Steve Dickey	Site Contact:	Date: 1/13/15	COC No:
Company Name: Dudek	Tel/Fax: (760) 450-6870	Lab Contact:	Carrier: Drop Off	1 of 1 COCs
Address: 3544 University	Analysis Turnaround Time			Sampler: SKD/CKH
City/State/Zip: Riverside, CA 92501	☐ CALENDAR DAYS ☐ WORKING DAYS			For Lab Use Only:
Phone: (760) 450-6870	TAT if different from Below			Walk-in Client:
Fax:	X 2 weeks			Lab Sampling:
Project Name: Reyland Electric	☐ 1 week			
Site: Reyland Electronix	☐ 2 days			Job / SDG No.:
P O #	☐ 1 day			

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS / MSD (Y/N)	8260	Sample Specific Notes:
MW-9	1/13	12:40		GW	3			X	
MW-8	1/13	12:50		GW	3			X	
MW-8 Dupe	1/13	~~13:40~~	12:55	GW	3			X	
Trip Blank	1/13	—		DI	3			X	
MW-3	1/13	15:50		GW	3			X	
MW-12	1/13	16:00		GW	3			X	
MW-11	1/13	16:10		GW	3			X	
MW-1		~~12~~ 13:10		GW	3			X	

440-134908 Chain of Custody

Preservation Used: (1= Ice) 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other _____

Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.

☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

☐ Return to Client ☒ Disposal by Lab ☐ Archive for _____ Months

Special Instructions/QC Requirements & Comments:

Custody Seals Intact: ☐ Yes ☐ No | Custody Seal No.: | Cooler Temp. (°C): Obs'd: 3.9 Corr'd: 3.5 Therm ID No.: 74

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
CKH	Dudek	1/13/16 6 p.m.			
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company: TA-I	Date/Time: 1/13/16 1800

Login Sample Receipt Checklist

Client: Dudek & Associates

Job Number: 440-134908-1

Login Number: 134908
List Number: 1
Creator: Escalante, Maria I

List Source: TestAmerica Irvine

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

21 January 2016

Steve Dickey
Dudek
605 Third St
Encinitas, CA 92024

RE:Reuland Electric

Work Order No.: 1601191

Attached are the results of the analyses for samples received by the laboratory on 01/13/16 18:30.

The samples were received by Sierra Analytical Labs, Inc. with a chain of custody record attached or completed at the submittal of the samples.

The analyses were performed according to the prescribed method as outlined by EPA, Standard Methods, and A.S.T.M.

The remaining portions of the samples will be disposed of within 30 days from the date of this report.
If you require any additional retaining time, please advise us.

Sincerely,

Richard K. Forsyth

Laboratory Director

Sierra Analytical Labs, Inc. is certified by the California Department of Health Services (DOHS),
Environmental Laboratory Accredidation Program (ELAP) No. 2320.

Dudek	Project:	Reuland Electric	
605 Third St	Project Number:	[none]	**Reported:**
Encinitas CA, 92024	Project Manager:	Steve Dickey	01/21/16 10:00

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW-9	1601191-01	Liquid	01/13/16 12:40	01/13/16 18:30
MW-8	1601191-02	Liquid	01/13/16 12:50	01/13/16 18:30
MW-1	1601191-03	Liquid	01/13/16 13:10	01/13/16 18:30
MW-8 DUP	1601191-04	Liquid	01/13/16 12:55	01/13/16 18:30
Trip Blank	1601191-05	Liquid	01/13/16 00:00	01/13/16 18:30
MW-3	1601191-06	Liquid	01/13/16 15:50	01/13/16 18:30
MW-12	1601191-07	Liquid	01/13/16 16:00	01/13/16 18:30
MW-11	1601191-08	Liquid	01/13/16 16:10	01/13/16 18:30

26052 MERIT CIRCLE SUITE 105, LAGUNA HILLS, CALIFORNIA 92653
TELEPHONE: (949) 348-9389 FAX: (949) 348-9115
E-MAIL: SIERRALABS @ SIERRALABS.NET

Dudek	Project: Reuland Electric	
605 Third St	Project Number: [none]	**Reported:**
Encinitas CA, 92024	Project Manager: Steve Dickey	01/21/16 10:00

Volatile Organic Compounds by EPA Method 8260B

Sierra Analytical Labs, Inc.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
MW-9 (1601191-01) Liquid Sampled: 01/13/16 12:40 Received: 01/13/16 18:30									
Benzene	ND	1.0	µg/L	1	B6A1404	01/14/16	01/14/16 13:36	EPA 8260B	
Bromobenzene	ND	1.0	"	"	"	"	"	"	
Bromochloromethane	ND	1.0	"	"	"	"	"	"	
Bromodichloromethane	ND	1.0	"	"	"	"	"	"	
Bromoform	ND	1.0	"	"	"	"	"	"	
Bromomethane	ND	1.0	"	"	"	"	"	"	
n-Butylbenzene	ND	1.0	"	"	"	"	"	"	
sec-Butylbenzene	ND	1.0	"	"	"	"	"	"	
tert-Butylbenzene	ND	1.0	"	"	"	"	"	"	
Carbon tetrachloride	ND	1.0	"	"	"	"	"	"	
Chlorobenzene	ND	1.0	"	"	"	"	"	"	
Chloroethane	ND	1.0	"	"	"	"	"	"	
Chloroform	ND	1.0	"	"	"	"	"	"	
Chloromethane	ND	1.0	"	"	"	"	"	"	
2-Chlorotoluene	ND	1.0	"	"	"	"	"	"	
4-Chlorotoluene	ND	1.0	"	"	"	"	"	"	
Dibromochloromethane	ND	1.0	"	"	"	"	"	"	
1,2-Dibromo-3-chloropropane	ND	5.0	"	"	"	"	"	"	
1,2-Dibromoethane (EDB)	ND	1.0	"	"	"	"	"	"	
Dibromomethane	ND	1.0	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	1.0	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	1.0	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	1.0	"	"	"	"	"	"	
Dichlorodifluoromethane	ND	1.0	"	"	"	"	"	"	
1,1-Dichloroethane	ND	1.0	"	"	"	"	"	"	
1,2-Dichloroethane	ND	1.0	"	"	"	"	"	"	
1,1-Dichloroethene	ND	1.0	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND	1.0	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	1.0	"	"	"	"	"	"	
1,2-Dichloropropane	ND	1.0	"	"	"	"	"	"	
1,3-Dichloropropane	ND	1.0	"	"	"	"	"	"	
2,2-Dichloropropane	ND	1.0	"	"	"	"	"	"	
1,1-Dichloropropene	ND	1.0	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	1.0	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Hexachlorobutadiene	ND	1.0	"	"	"	"	"	"	
Isopropylbenzene	ND	1.0	"	"	"	"	"	"	
p-Isopropyltoluene	ND	1.0	"	"	"	"	"	"	
Methylene chloride	ND	1.0	"	"	"	"	"	"	
Methyl tert-butyl ether	ND	1.0	"	"	"	"	"	"	

Dudek	Project: Reuland Electric	
605 Third St	Project Number: [none]	**Reported:**
Encinitas CA, 92024	Project Manager: Steve Dickey	01/21/16 10:00

Volatile Organic Compounds by EPA Method 8260B

Sierra Analytical Labs, Inc.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
MW-9 (1601191-01) Liquid Sampled: 01/13/16 12:40 Received: 01/13/16 18:30									
Naphthalene	ND	1.0	µg/L	1	B6A1404	01/14/16	01/14/16 13:36	EPA 8260B	
n-Propylbenzene	ND	1.0	"	"	"	"	"	"	
Styrene	ND	1.0	"	"	"	"	"	"	
1,1,1,2-Tetrachloroethane	ND	1.0	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	1.0	"	"	"	"	"	"	
Tetrachloroethene	**8.5**	1.0	"	"	"	"	"	"	
Toluene	ND	1.0	"	"	"	"	"	"	
1,2,3-Trichlorobenzene	ND	1.0	"	"	"	"	"	"	
1,2,4-Trichlorobenzene	ND	1.0	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	1.0	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	1.0	"	"	"	"	"	"	
Trichloroethene	ND	1.0	"	"	"	"	"	"	
Trichlorofluoromethane	ND	1.0	"	"	"	"	"	"	
1,2,3-Trichloropropane	ND	1.0	"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	1.0	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	1.0	"	"	"	"	"	"	
Vinyl chloride	ND	1.0	"	"	"	"	"	"	
m,p-Xylene	ND	1.0	"	"	"	"	"	"	
o-Xylene	ND	1.0	"	"	"	"	"	"	
Surrogate: Dibromofluoromethane		*102 %*		*86-118*	"	"	"	"	
Surrogate: Toluene-d8		*94.6 %*		*88-110*	"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*98.6 %*		*86-115*	"	"	"	"	
MW-8 (1601191-02) Liquid Sampled: 01/13/16 12:50 Received: 01/13/16 18:30									
Benzene	ND	1.0	µg/L	1	B6A1404	01/14/16	01/14/16 13:36	EPA 8260B	
Bromobenzene	ND	1.0	"	"	"	"	"	"	
Bromochloromethane	ND	1.0	"	"	"	"	"	"	
Bromodichloromethane	ND	1.0	"	"	"	"	"	"	
Bromoform	ND	1.0	"	"	"	"	"	"	
Bromomethane	ND	1.0	"	"	"	"	"	"	
n-Butylbenzene	ND	1.0	"	"	"	"	"	"	
sec-Butylbenzene	ND	1.0	"	"	"	"	"	"	
tert-Butylbenzene	ND	1.0	"	"	"	"	"	"	
Carbon tetrachloride	ND	1.0	"	"	"	"	"	"	
Chlorobenzene	ND	1.0	"	"	"	"	"	"	
Chloroethane	ND	1.0	"	"	"	"	"	"	
Chloroform	ND	1.0	"	"	"	"	"	"	
Chloromethane	ND	1.0	"	"	"	"	"	"	
2-Chlorotoluene	ND	1.0	"	"	"	"	"	"	
4-Chlorotoluene	ND	1.0	"	"	"	"	"	"	
Dibromochloromethane	ND	1.0	"	"	"	"	"	"	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Dudek	Project: Reuland Electric	
605 Third St	Project Number: [none]	**Reported:**
Encinitas CA, 92024	Project Manager: Steve Dickey	01/21/16 10:00

Volatile Organic Compounds by EPA Method 8260B

Sierra Analytical Labs, Inc.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
MW-8 (1601191-02) Liquid Sampled: 01/13/16 12:50 Received: 01/13/16 18:30									
1,2-Dibromo-3-chloropropane	ND	5.0	µg/L	1	B6A1404	01/14/16	01/14/16 13:36	EPA 8260B	
1,2-Dibromoethane (EDB)	ND	1.0	"	"	"	"	"	"	
Dibromomethane	ND	1.0	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	1.0	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	1.0	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	1.0	"	"	"	"	"	"	
Dichlorodifluoromethane	ND	1.0	"	"	"	"	"	"	
1,1-Dichloroethane	ND	1.0	"	"	"	"	"	"	
1,2-Dichloroethane	ND	1.0	"	"	"	"	"	"	
1,1-Dichloroethene	ND	1.0	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND	1.0	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	1.0	"	"	"	"	"	"	
1,2-Dichloropropane	ND	1.0	"	"	"	"	"	"	
1,3-Dichloropropane	ND	1.0	"	"	"	"	"	"	
2,2-Dichloropropane	ND	1.0	"	"	"	"	"	"	
1,1-Dichloropropene	ND	1.0	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	1.0	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	**5.1**	1.0	"	"	"	"	"	"	
Hexachlorobutadiene	ND	1.0	"	"	"	"	"	"	
Isopropylbenzene	ND	1.0	"	"	"	"	"	"	
p-Isopropyltoluene	ND	1.0	"	"	"	"	"	"	
Methylene chloride	ND	1.0	"	"	"	"	"	"	
Methyl tert-butyl ether	ND	1.0	"	"	"	"	"	"	
Naphthalene	ND	1.0	"	"	"	"	"	"	
n-Propylbenzene	ND	1.0	"	"	"	"	"	"	
Styrene	ND	1.0	"	"	"	"	"	"	
1,1,1,2-Tetrachloroethane	ND	1.0	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	1.0	"	"	"	"	"	"	
Tetrachloroethene	**9.0**	1.0	"	"	"	"	"	"	
Toluene	ND	1.0	"	"	"	"	"	"	
1,2,3-Trichlorobenzene	ND	1.0	"	"	"	"	"	"	
1,2,4-Trichlorobenzene	ND	1.0	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	1.0	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	1.0	"	"	"	"	"	"	
Trichloroethene	**22**	1.0	"	"	"	"	"	"	
Trichlorofluoromethane	ND	1.0	"	"	"	"	"	"	
1,2,3-Trichloropropane	ND	1.0	"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	1.0	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	1.0	"	"	"	"	"	"	
Vinyl chloride	ND	1.0	"	"	"	"	"	"	

Dudek	Project: Reuland Electric	
605 Third St	Project Number: [none]	**Reported:**
Encinitas CA, 92024	Project Manager: Steve Dickey	01/21/16 10:00

Volatile Organic Compounds by EPA Method 8260B

Sierra Analytical Labs, Inc.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
MW-8 (1601191-02) Liquid Sampled: 01/13/16 12:50 Received: 01/13/16 18:30									
m,p-Xylene	**9.8**	1.0	µg/L	1	B6A1404	01/14/16	01/14/16 13:36	EPA 8260B	
o-Xylene	**1.3**	1.0	"	"	"	"	"	"	
Surrogate: Dibromofluoromethane		*106 %*		*86-118*		"	"	"	
Surrogate: Toluene-d8		*93.8 %*		*88-110*		"	"	"	
Surrogate: 4-Bromofluorobenzene		*97.4 %*		*86-115*		"	"	"	
MW-1 (1601191-03) Liquid Sampled: 01/13/16 13:10 Received: 01/13/16 18:30									
Benzene	ND	1.0	µg/L	1	B6A1404	01/14/16	01/14/16 13:36	EPA 8260B	
Bromobenzene	ND	1.0	"	"	"	"	"	"	
Bromochloromethane	ND	1.0	"	"	"	"	"	"	
Bromodichloromethane	ND	1.0	"	"	"	"	"	"	
Bromoform	ND	1.0	"	"	"	"	"	"	
Bromomethane	ND	1.0	"	"	"	"	"	"	
n-Butylbenzene	ND	1.0	"	"	"	"	"	"	
sec-Butylbenzene	ND	1.0	"	"	"	"	"	"	
tert-Butylbenzene	ND	1.0	"	"	"	"	"	"	
Carbon tetrachloride	ND	1.0	"	"	"	"	"	"	
Chlorobenzene	ND	1.0	"	"	"	"	"	"	
Chloroethane	ND	1.0	"	"	"	"	"	"	
Chloroform	ND	1.0	"	"	"	"	"	"	
Chloromethane	ND	1.0	"	"	"	"	"	"	
2-Chlorotoluene	ND	1.0	"	"	"	"	"	"	
4-Chlorotoluene	ND	1.0	"	"	"	"	"	"	
Dibromochloromethane	ND	1.0	"	"	"	"	"	"	
1,2-Dibromo-3-chloropropane	ND	5.0	"	"	"	"	"	"	
1,2-Dibromoethane (EDB)	ND	1.0	"	"	"	"	"	"	
Dibromomethane	ND	1.0	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	1.0	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	1.0	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	1.0	"	"	"	"	"	"	
Dichlorodifluoromethane	ND	1.0	"	"	"	"	"	"	
1,1-Dichloroethane	ND	1.0	"	"	"	"	"	"	
1,2-Dichloroethane	ND	1.0	"	"	"	"	"	"	
1,1-Dichloroethene	ND	1.0	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND	1.0	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	1.0	"	"	"	"	"	"	
1,2-Dichloropropane	ND	1.0	"	"	"	"	"	"	
1,3-Dichloropropane	ND	1.0	"	"	"	"	"	"	
2,2-Dichloropropane	ND	1.0	"	"	"	"	"	"	
1,1-Dichloropropene	ND	1.0	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	1.0	"	"	"	"	"	"	

Dudek	Project: Reuland Electric	
605 Third St	Project Number: [none]	**Reported:**
Encinitas CA, 92024	Project Manager: Steve Dickey	01/21/16 10:00

Volatile Organic Compounds by EPA Method 8260B

Sierra Analytical Labs, Inc.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
MW-1 (1601191-03) Liquid Sampled: 01/13/16 13:10 Received: 01/13/16 18:30									
trans-1,3-Dichloropropene	ND	1.0	µg/L	1	B6A1404	01/14/16	01/14/16 13:36	EPA 8260B	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Hexachlorobutadiene	ND	1.0	"	"	"	"	"	"	
Isopropylbenzene	ND	1.0	"	"	"	"	"	"	
p-Isopropyltoluene	ND	1.0	"	"	"	"	"	"	
Methylene chloride	ND	1.0	"	"	"	"	"	"	
Methyl tert-butyl ether	ND	1.0	"	"	"	"	"	"	
Naphthalene	ND	1.0	"	"	"	"	"	"	
n-Propylbenzene	ND	1.0	"	"	"	"	"	"	
Styrene	ND	1.0	"	"	"	"	"	"	
1,1,1,2-Tetrachloroethane	ND	1.0	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	1.0	"	"	"	"	"	"	
Tetrachloroethene	**3.2**	1.0	"	"	"	"	"	"	
Toluene	ND	1.0	"	"	"	"	"	"	
1,2,3-Trichlorobenzene	ND	1.0	"	"	"	"	"	"	
1,2,4-Trichlorobenzene	ND	1.0	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	1.0	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	1.0	"	"	"	"	"	"	
Trichloroethene	ND	1.0	"	"	"	"	"	"	
Trichlorofluoromethane	ND	1.0	"	"	"	"	"	"	
1,2,3-Trichloropropane	ND	1.0	"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	1.0	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	1.0	"	"	"	"	"	"	
Vinyl chloride	ND	1.0	"	"	"	"	"	"	
m,p-Xylene	ND	1.0	"	"	"	"	"	"	
o-Xylene	ND	1.0	"	"	"	"	"	"	
Surrogate: Dibromofluoromethane		*107 %*		*86-118*	"	"	"	"	
Surrogate: Toluene-d8		*95.2 %*		*88-110*	"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*108 %*		*86-115*	"	"	"	"	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Dudek	Project: Reuland Electric	
605 Third St	Project Number: [none]	**Reported:**
Encinitas CA, 92024	Project Manager: Steve Dickey	01/21/16 10:00

Volatile Organic Compounds by EPA Method 8260B

Sierra Analytical Labs, Inc.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
MW-8 DUP (1601191-04) Liquid Sampled: 01/13/16 12:55 Received: 01/13/16 18:30									
Benzene	ND	1.0	µg/L	1	B6A1404	01/14/16	01/14/16 13:36	EPA 8260B	
Bromobenzene	ND	1.0	"	"	"	"	"	"	
Bromochloromethane	ND	1.0	"	"	"	"	"	"	
Bromodichloromethane	ND	1.0	"	"	"	"	"	"	
Bromoform	ND	1.0	"	"	"	"	"	"	
Bromomethane	ND	1.0	"	"	"	"	"	"	
n-Butylbenzene	ND	1.0	"	"	"	"	"	"	
sec-Butylbenzene	ND	1.0	"	"	"	"	"	"	
tert-Butylbenzene	ND	1.0	"	"	"	"	"	"	
Carbon tetrachloride	ND	1.0	"	"	"	"	"	"	
Chlorobenzene	ND	1.0	"	"	"	"	"	"	
Chloroethane	ND	1.0	"	"	"	"	"	"	
Chloroform	ND	1.0	"	"	"	"	"	"	
Chloromethane	ND	1.0	"	"	"	"	"	"	
2-Chlorotoluene	ND	1.0	"	"	"	"	"	"	
4-Chlorotoluene	ND	1.0	"	"	"	"	"	"	
Dibromochloromethane	ND	1.0	"	"	"	"	"	"	
1,2-Dibromo-3-chloropropane	ND	5.0	"	"	"	"	"	"	
1,2-Dibromoethane (EDB)	ND	1.0	"	"	"	"	"	"	
Dibromomethane	ND	1.0	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	1.0	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	1.0	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	1.0	"	"	"	"	"	"	
Dichlorodifluoromethane	ND	1.0	"	"	"	"	"	"	
1,1-Dichloroethane	ND	1.0	"	"	"	"	"	"	
1,2-Dichloroethane	ND	1.0	"	"	"	"	"	"	
1,1-Dichloroethene	ND	1.0	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND	1.0	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	1.0	"	"	"	"	"	"	
1,2-Dichloropropane	ND	1.0	"	"	"	"	"	"	
1,3-Dichloropropane	ND	1.0	"	"	"	"	"	"	
2,2-Dichloropropane	ND	1.0	"	"	"	"	"	"	
1,1-Dichloropropene	ND	1.0	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	1.0	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Hexachlorobutadiene	ND	1.0	"	"	"	"	"	"	
Isopropylbenzene	ND	1.0	"	"	"	"	"	"	
p-Isopropyltoluene	ND	1.0	"	"	"	"	"	"	
Methylene chloride	ND	1.0	"	"	"	"	"	"	
Methyl tert-butyl ether	ND	1.0	"	"	"	"	"	"	

Dudek	Project: Reuland Electric	
605 Third St	Project Number: [none]	**Reported:**
Encinitas CA, 92024	Project Manager: Steve Dickey	01/21/16 10:00

Volatile Organic Compounds by EPA Method 8260B

Sierra Analytical Labs, Inc.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
MW-8 DUP (1601191-04) Liquid Sampled: 01/13/16 12:55 Received: 01/13/16 18:30									
Naphthalene	ND	1.0	µg/L	1	B6A1404	01/14/16	01/14/16 13:36	EPA 8260B	
n-Propylbenzene	ND	1.0	"	"	"	"	"	"	
Styrene	ND	1.0	"	"	"	"	"	"	
1,1,1,2-Tetrachloroethane	ND	1.0	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	1.0	"	"	"	"	"	"	
Tetrachloroethene	**10**	1.0	"	"	"	"	"	"	
Toluene	ND	1.0	"	"	"	"	"	"	
1,2,3-Trichlorobenzene	ND	1.0	"	"	"	"	"	"	
1,2,4-Trichlorobenzene	ND	1.0	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	1.0	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	1.0	"	"	"	"	"	"	
Trichloroethene	ND	1.0	"	"	"	"	"	"	
Trichlorofluoromethane	ND	1.0	"	"	"	"	"	"	
1,2,3-Trichloropropane	ND	1.0	"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	1.0	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	1.0	"	"	"	"	"	"	
Vinyl chloride	ND	1.0	"	"	"	"	"	"	
m,p-Xylene	ND	1.0	"	"	"	"	"	"	
o-Xylene	ND	1.0	"	"	"	"	"	"	
Surrogate: Dibromofluoromethane		*102 %*		*86-118*	"	"	"	"	
Surrogate: Toluene-d8		*93.8 %*		*88-110*	"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*110 %*		*86-115*	"	"	"	"	
Trip Blank (1601191-05) Liquid Sampled: 01/13/16 00:00 Received: 01/13/16 18:30									
Benzene	ND	1.0	µg/L	1	B6A1404	01/14/16	01/14/16 13:36	EPA 8260B	
Bromobenzene	ND	1.0	"	"	"	"	"	"	
Bromochloromethane	ND	1.0	"	"	"	"	"	"	
Bromodichloromethane	ND	1.0	"	"	"	"	"	"	
Bromoform	ND	1.0	"	"	"	"	"	"	
Bromomethane	ND	1.0	"	"	"	"	"	"	
n-Butylbenzene	ND	1.0	"	"	"	"	"	"	
sec-Butylbenzene	ND	1.0	"	"	"	"	"	"	
tert-Butylbenzene	ND	1.0	"	"	"	"	"	"	
Carbon tetrachloride	ND	1.0	"	"	"	"	"	"	
Chlorobenzene	ND	1.0	"	"	"	"	"	"	
Chloroethane	ND	1.0	"	"	"	"	"	"	
Chloroform	ND	1.0	"	"	"	"	"	"	
Chloromethane	ND	1.0	"	"	"	"	"	"	
2-Chlorotoluene	ND	1.0	"	"	"	"	"	"	
4-Chlorotoluene	ND	1.0	"	"	"	"	"	"	
Dibromochloromethane	ND	1.0	"	"	"	"	"	"	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Dudek	Project: Reuland Electric	
605 Third St	Project Number: [none]	**Reported:**
Encinitas CA, 92024	Project Manager: Steve Dickey	01/21/16 10:00

Volatile Organic Compounds by EPA Method 8260B

Sierra Analytical Labs, Inc.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Trip Blank (1601191-05) Liquid Sampled: 01/13/16 00:00 Received: 01/13/16 18:30									
1,2-Dibromo-3-chloropropane	ND	5.0	µg/L	1	B6A1404	01/14/16	01/14/16 13:36	EPA 8260B	
1,2-Dibromoethane (EDB)	ND	1.0	"	"	"	"	"	"	
Dibromomethane	ND	1.0	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	1.0	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	1.0	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	1.0	"	"	"	"	"	"	
Dichlorodifluoromethane	ND	1.0	"	"	"	"	"	"	
1,1-Dichloroethane	ND	1.0	"	"	"	"	"	"	
1,2-Dichloroethane	ND	1.0	"	"	"	"	"	"	
1,1-Dichloroethene	ND	1.0	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND	1.0	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	1.0	"	"	"	"	"	"	
1,2-Dichloropropane	ND	1.0	"	"	"	"	"	"	
1,3-Dichloropropane	ND	1.0	"	"	"	"	"	"	
2,2-Dichloropropane	ND	1.0	"	"	"	"	"	"	
1,1-Dichloropropene	ND	1.0	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	1.0	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Hexachlorobutadiene	ND	1.0	"	"	"	"	"	"	
Isopropylbenzene	ND	1.0	"	"	"	"	"	"	
p-Isopropyltoluene	ND	1.0	"	"	"	"	"	"	
Methylene chloride	ND	1.0	"	"	"	"	"	"	
Methyl tert-butyl ether	ND	1.0	"	"	"	"	"	"	
Naphthalene	ND	1.0	"	"	"	"	"	"	
n-Propylbenzene	ND	1.0	"	"	"	"	"	"	
Styrene	ND	1.0	"	"	"	"	"	"	
1,1,1,2-Tetrachloroethane	ND	1.0	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	1.0	"	"	"	"	"	"	
Tetrachloroethene	ND	1.0	"	"	"	"	"	"	
Toluene	ND	1.0	"	"	"	"	"	"	
1,2,3-Trichlorobenzene	ND	1.0	"	"	"	"	"	"	
1,2,4-Trichlorobenzene	ND	1.0	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	1.0	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	1.0	"	"	"	"	"	"	
Trichloroethene	ND	1.0	"	"	"	"	"	"	
Trichlorofluoromethane	ND	1.0	"	"	"	"	"	"	
1,2,3-Trichloropropane	ND	1.0	"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	1.0	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	1.0	"	"	"	"	"	"	
Vinyl chloride	ND	1.0	"	"	"	"	"	"	

Dudek	Project: Reuland Electric	
605 Third St	Project Number: [none]	**Reported:**
Encinitas CA, 92024	Project Manager: Steve Dickey	01/21/16 10:00

Volatile Organic Compounds by EPA Method 8260B

Sierra Analytical Labs, Inc.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Trip Blank (1601191-05) Liquid Sampled: 01/13/16 00:00 Received: 01/13/16 18:30									
m,p-Xylene	ND	1.0	µg/L	1	B6A1404	01/14/16	01/14/16 13:36	EPA 8260B	
o-Xylene	ND	1.0	"	"	"	"	"	"	
Surrogate: Dibromofluoromethane		*107 %*		*86-118*		"	"	"	
Surrogate: Toluene-d8		*94.2 %*		*88-110*		"	"	"	
Surrogate: 4-Bromofluorobenzene		*111 %*		*86-115*		"	"	"	
MW-3 (1601191-06) Liquid Sampled: 01/13/16 15:50 Received: 01/13/16 18:30									
Benzene	ND	1.0	µg/L	1	B6A1404	01/14/16	01/14/16 13:36	EPA 8260B	
Bromobenzene	ND	1.0	"	"	"	"	"	"	
Bromochloromethane	ND	1.0	"	"	"	"	"	"	
Bromodichloromethane	ND	1.0	"	"	"	"	"	"	
Bromoform	ND	1.0	"	"	"	"	"	"	
Bromomethane	ND	1.0	"	"	"	"	"	"	
n-Butylbenzene	ND	1.0	"	"	"	"	"	"	
sec-Butylbenzene	ND	1.0	"	"	"	"	"	"	
tert-Butylbenzene	ND	1.0	"	"	"	"	"	"	
Carbon tetrachloride	ND	1.0	"	"	"	"	"	"	
Chlorobenzene	ND	1.0	"	"	"	"	"	"	
Chloroethane	ND	1.0	"	"	"	"	"	"	
Chloroform	ND	1.0	"	"	"	"	"	"	
Chloromethane	ND	1.0	"	"	"	"	"	"	
2-Chlorotoluene	ND	1.0	"	"	"	"	"	"	
4-Chlorotoluene	ND	1.0	"	"	"	"	"	"	
Dibromochloromethane	ND	1.0	"	"	"	"	"	"	
1,2-Dibromo-3-chloropropane	ND	5.0	"	"	"	"	"	"	
1,2-Dibromoethane (EDB)	ND	1.0	"	"	"	"	"	"	
Dibromomethane	ND	1.0	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	1.0	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	1.0	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	1.0	"	"	"	"	"	"	
Dichlorodifluoromethane	ND	1.0	"	"	"	"	"	"	
1,1-Dichloroethane	ND	1.0	"	"	"	"	"	"	
1,2-Dichloroethane	ND	1.0	"	"	"	"	"	"	
1,1-Dichloroethene	ND	1.0	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND	1.0	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	1.0	"	"	"	"	"	"	
1,2-Dichloropropane	ND	1.0	"	"	"	"	"	"	
1,3-Dichloropropane	ND	1.0	"	"	"	"	"	"	
2,2-Dichloropropane	ND	1.0	"	"	"	"	"	"	
1,1-Dichloropropene	ND	1.0	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	1.0	"	"	"	"	"	"	

Dudek	Project: Reuland Electric	
605 Third St	Project Number: [none]	**Reported:**
Encinitas CA, 92024	Project Manager: Steve Dickey	01/21/16 10:00

Volatile Organic Compounds by EPA Method 8260B

Sierra Analytical Labs, Inc.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
MW-3 (1601191-06) Liquid Sampled: 01/13/16 15:50 Received: 01/13/16 18:30									
trans-1,3-Dichloropropene	ND	1.0	µg/L	1	B6A1404	01/14/16	01/14/16 13:36	EPA 8260B	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Hexachlorobutadiene	ND	1.0	"	"	"	"	"	"	
Isopropylbenzene	ND	1.0	"	"	"	"	"	"	
p-Isopropyltoluene	ND	1.0	"	"	"	"	"	"	
Methylene chloride	ND	1.0	"	"	"	"	"	"	
Methyl tert-butyl ether	ND	1.0	"	"	"	"	"	"	
Naphthalene	ND	1.0	"	"	"	"	"	"	
n-Propylbenzene	ND	1.0	"	"	"	"	"	"	
Styrene	ND	1.0	"	"	"	"	"	"	
1,1,1,2-Tetrachloroethane	ND	1.0	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	1.0	"	"	"	"	"	"	
Tetrachloroethene	**7.3**	1.0	"	"	"	"	"	"	
Toluene	ND	1.0	"	"	"	"	"	"	
1,2,3-Trichlorobenzene	ND	1.0	"	"	"	"	"	"	
1,2,4-Trichlorobenzene	ND	1.0	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	1.0	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	1.0	"	"	"	"	"	"	
Trichloroethene	ND	1.0	"	"	"	"	"	"	
Trichlorofluoromethane	ND	1.0	"	"	"	"	"	"	
1,2,3-Trichloropropane	ND	1.0	"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	1.0	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	1.0	"	"	"	"	"	"	
Vinyl chloride	ND	1.0	"	"	"	"	"	"	
m,p-Xylene	ND	1.0	"	"	"	"	"	"	
o-Xylene	ND	1.0	"	"	"	"	"	"	
Surrogate: Dibromofluoromethane		*112 %*		*86-118*	"	"	"	"	
Surrogate: Toluene-d8		*96.0 %*		*88-110*	"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*108 %*		*86-115*	"	"	"	"	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Dudek	Project: Reuland Electric	
605 Third St	Project Number: [none]	**Reported:**
Encinitas CA, 92024	Project Manager: Steve Dickey	01/21/16 10:00

Volatile Organic Compounds by EPA Method 8260B

Sierra Analytical Labs, Inc.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
MW-12 (1601191-07) Liquid Sampled: 01/13/16 16:00 Received: 01/13/16 18:30									
Benzene	ND	1.0	µg/L	1	B6A1404	01/14/16	01/14/16 13:36	EPA 8260B	
Bromobenzene	ND	1.0	"	"	"	"	"	"	
Bromochloromethane	ND	1.0	"	"	"	"	"	"	
Bromodichloromethane	ND	1.0	"	"	"	"	"	"	
Bromoform	ND	1.0	"	"	"	"	"	"	
Bromomethane	ND	1.0	"	"	"	"	"	"	
n-Butylbenzene	ND	1.0	"	"	"	"	"	"	
sec-Butylbenzene	ND	1.0	"	"	"	"	"	"	
tert-Butylbenzene	ND	1.0	"	"	"	"	"	"	
Carbon tetrachloride	ND	1.0	"	"	"	"	"	"	
Chlorobenzene	ND	1.0	"	"	"	"	"	"	
Chloroethane	ND	1.0	"	"	"	"	"	"	
Chloroform	ND	1.0	"	"	"	"	"	"	
Chloromethane	ND	1.0	"	"	"	"	"	"	
2-Chlorotoluene	ND	1.0	"	"	"	"	"	"	
4-Chlorotoluene	ND	1.0	"	"	"	"	"	"	
Dibromochloromethane	ND	1.0	"	"	"	"	"	"	
1,2-Dibromo-3-chloropropane	ND	5.0	"	"	"	"	"	"	
1,2-Dibromoethane (EDB)	ND	1.0	"	"	"	"	"	"	
Dibromomethane	ND	1.0	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	1.0	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	1.0	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	1.0	"	"	"	"	"	"	
Dichlorodifluoromethane	ND	1.0	"	"	"	"	"	"	
1,1-Dichloroethane	ND	1.0	"	"	"	"	"	"	
1,2-Dichloroethane	ND	1.0	"	"	"	"	"	"	
1,1-Dichloroethene	ND	1.0	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND	1.0	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	1.0	"	"	"	"	"	"	
1,2-Dichloropropane	ND	1.0	"	"	"	"	"	"	
1,3-Dichloropropane	ND	1.0	"	"	"	"	"	"	
2,2-Dichloropropane	ND	1.0	"	"	"	"	"	"	
1,1-Dichloropropene	ND	1.0	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	1.0	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Hexachlorobutadiene	ND	1.0	"	"	"	"	"	"	
Isopropylbenzene	ND	1.0	"	"	"	"	"	"	
p-Isopropyltoluene	ND	1.0	"	"	"	"	"	"	
Methylene chloride	ND	1.0	"	"	"	"	"	"	
Methyl tert-butyl ether	ND	1.0	"	"	"	"	"	"	

Dudek	Project: Reuland Electric	
605 Third St	Project Number: [none]	**Reported:**
Encinitas CA, 92024	Project Manager: Steve Dickey	01/21/16 10:00

Volatile Organic Compounds by EPA Method 8260B

Sierra Analytical Labs, Inc.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
MW-12 (1601191-07) Liquid Sampled: 01/13/16 16:00 Received: 01/13/16 18:30									
Naphthalene	ND	1.0	µg/L	1	B6A1404	01/14/16	01/14/16 13:36	EPA 8260B	
n-Propylbenzene	ND	1.0	"	"	"	"	"	"	
Styrene	ND	1.0	"	"	"	"	"	"	
1,1,1,2-Tetrachloroethane	ND	1.0	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	1.0	"	"	"	"	"	"	
Tetrachloroethene	**6.3**	1.0	"	"	"	"	"	"	
Toluene	ND	1.0	"	"	"	"	"	"	
1,2,3-Trichlorobenzene	ND	1.0	"	"	"	"	"	"	
1,2,4-Trichlorobenzene	ND	1.0	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	1.0	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	1.0	"	"	"	"	"	"	
Trichloroethene	ND	1.0	"	"	"	"	"	"	
Trichlorofluoromethane	ND	1.0	"	"	"	"	"	"	
1,2,3-Trichloropropane	ND	1.0	"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	1.0	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	1.0	"	"	"	"	"	"	
Vinyl chloride	ND	1.0	"	"	"	"	"	"	
m,p-Xylene	ND	1.0	"	"	"	"	"	"	
o-Xylene	ND	1.0	"	"	"	"	"	"	
Surrogate: Dibromofluoromethane		*102 %*		*86-118*	"	"	"	"	
Surrogate: Toluene-d8		*93.4 %*		*88-110*	"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*109 %*		*86-115*	"	"	"	"	
MW-11 (1601191-08) Liquid Sampled: 01/13/16 16:10 Received: 01/13/16 18:30									
Benzene	ND	1.0	µg/L	1	B6A1404	01/14/16	01/14/16 13:36	EPA 8260B	
Bromobenzene	ND	1.0	"	"	"	"	"	"	
Bromochloromethane	ND	1.0	"	"	"	"	"	"	
Bromodichloromethane	ND	1.0	"	"	"	"	"	"	
Bromoform	ND	1.0	"	"	"	"	"	"	
Bromomethane	ND	1.0	"	"	"	"	"	"	
n-Butylbenzene	ND	1.0	"	"	"	"	"	"	
sec-Butylbenzene	ND	1.0	"	"	"	"	"	"	
tert-Butylbenzene	ND	1.0	"	"	"	"	"	"	
Carbon tetrachloride	ND	1.0	"	"	"	"	"	"	
Chlorobenzene	ND	1.0	"	"	"	"	"	"	
Chloroethane	ND	1.0	"	"	"	"	"	"	
Chloroform	ND	1.0	"	"	"	"	"	"	
Chloromethane	ND	1.0	"	"	"	"	"	"	
2-Chlorotoluene	ND	1.0	"	"	"	"	"	"	
4-Chlorotoluene	ND	1.0	"	"	"	"	"	"	
Dibromochloromethane	ND	1.0	"	"	"	"	"	"	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Dudek	Project: Reuland Electric	
605 Third St	Project Number: [none]	**Reported:**
Encinitas CA, 92024	Project Manager: Steve Dickey	01/21/16 10:00

Volatile Organic Compounds by EPA Method 8260B

Sierra Analytical Labs, Inc.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
MW-11 (1601191-08) Liquid	**Sampled: 01/13/16 16:10**	**Received: 01/13/16 18:30**							
1,2-Dibromo-3-chloropropane	ND	5.0	µg/L	1	B6A1404	01/14/16	01/14/16 13:36	EPA 8260B	
1,2-Dibromoethane (EDB)	ND	1.0	"	"	"	"	"	"	
Dibromomethane	ND	1.0	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	1.0	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	1.0	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	1.0	"	"	"	"	"	"	
Dichlorodifluoromethane	ND	1.0	"	"	"	"	"	"	
1,1-Dichloroethane	ND	1.0	"	"	"	"	"	"	
1,2-Dichloroethane	ND	1.0	"	"	"	"	"	"	
1,1-Dichloroethene	ND	1.0	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND	1.0	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	1.0	"	"	"	"	"	"	
1,2-Dichloropropane	ND	1.0	"	"	"	"	"	"	
1,3-Dichloropropane	ND	1.0	"	"	"	"	"	"	
2,2-Dichloropropane	ND	1.0	"	"	"	"	"	"	
1,1-Dichloropropene	ND	1.0	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	1.0	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	1.0	"	"	"	"	"	"	
Ethylbenzene	ND	1.0	"	"	"	"	"	"	
Hexachlorobutadiene	ND	1.0	"	"	"	"	"	"	
Isopropylbenzene	ND	1.0	"	"	"	"	"	"	
p-Isopropyltoluene	ND	1.0	"	"	"	"	"	"	
Methylene chloride	ND	1.0	"	"	"	"	"	"	
Methyl tert-butyl ether	ND	1.0	"	"	"	"	"	"	
Naphthalene	ND	1.0	"	"	"	"	"	"	
n-Propylbenzene	ND	1.0	"	"	"	"	"	"	
Styrene	ND	1.0	"	"	"	"	"	"	
1,1,1,2-Tetrachloroethane	ND	1.0	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	1.0	"	"	"	"	"	"	
Tetrachloroethene	**26**	1.0	"	"	"	"	"	"	
Toluene	ND	1.0	"	"	"	"	"	"	
1,2,3-Trichlorobenzene	ND	1.0	"	"	"	"	"	"	
1,2,4-Trichlorobenzene	ND	1.0	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	1.0	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	1.0	"	"	"	"	"	"	
Trichloroethene	ND	1.0	"	"	"	"	"	"	
Trichlorofluoromethane	ND	1.0	"	"	"	"	"	"	
1,2,3-Trichloropropane	ND	1.0	"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	1.0	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	1.0	"	"	"	"	"	"	
Vinyl chloride	ND	1.0	"	"	"	"	"	"	

Dudek	Project: Reuland Electric	
605 Third St	Project Number: [none]	**Reported:**
Encinitas CA, 92024	Project Manager: Steve Dickey	01/21/16 10:00

Volatile Organic Compounds by EPA Method 8260B

Sierra Analytical Labs, Inc.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
MW-11 (1601191-08) Liquid Sampled: 01/13/16 16:10 Received: 01/13/16 18:30									
m,p-Xylene	ND	1.0	µg/L	1	B6A1404	01/14/16	01/14/16 13:36	EPA 8260B	
o-Xylene	ND	1.0	"	"	"	"	"	"	
Surrogate: Dibromofluoromethane		*103 %*	*86-118*		"	"	"	"	
Surrogate: Toluene-d8		*91.4 %*	*88-110*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*109 %*	*86-115*		"	"	"	"	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Dudek	Project: Reuland Electric	
605 Third St	Project Number: [none]	**Reported:**
Encinitas CA, 92024	Project Manager: Steve Dickey	01/21/16 10:00

Volatile Organic Compounds by EPA Method 8260B - Quality Control

Sierra Analytical Labs, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B6A1404 - EPA 5030B P & T										
Blank (B6A1404-BLK1)				Prepared & Analyzed: 01/14/16						
Benzene	ND	1.0	µg/L							
Bromobenzene	ND	1.0	"							
Bromochloromethane	ND	1.0	"							
Bromodichloromethane	ND	1.0	"							
Bromoform	ND	1.0	"							
Bromomethane	ND	1.0	"							
n-Butylbenzene	ND	1.0	"							
sec-Butylbenzene	ND	1.0	"							
tert-Butylbenzene	ND	1.0	"							
Carbon tetrachloride	ND	1.0	"							
Chlorobenzene	ND	1.0	"							
Chloroethane	ND	1.0	"							
Chloroform	ND	1.0	"							
Chloromethane	ND	1.0	"							
2-Chlorotoluene	ND	1.0	"							
4-Chlorotoluene	ND	1.0	"							
Dibromochloromethane	ND	1.0	"							
1,2-Dibromo-3-chloropropane	ND	5.0	"							
1,2-Dibromoethane (EDB)	ND	1.0	"							
Dibromomethane	ND	1.0	"							
1,2-Dichlorobenzene	ND	1.0	"							
1,3-Dichlorobenzene	ND	1.0	"							
1,4-Dichlorobenzene	ND	1.0	"							
Dichlorodifluoromethane	ND	1.0	"							
1,1-Dichloroethane	ND	1.0	"							
1,2-Dichloroethane	ND	1.0	"							
1,1-Dichloroethene	ND	1.0	"							
cis-1,2-Dichloroethene	ND	1.0	"							
trans-1,2-Dichloroethene	ND	1.0	"							
1,2-Dichloropropane	ND	1.0	"							
1,3-Dichloropropane	ND	1.0	"							
2,2-Dichloropropane	ND	1.0	"							
1,1-Dichloropropene	ND	1.0	"							
cis-1,3-Dichloropropene	ND	1.0	"							
trans-1,3-Dichloropropene	ND	1.0	"							
Ethylbenzene	ND	1.0	"							
Hexachlorobutadiene	ND	1.0	"							

Dudek	Project: Reuland Electric	
605 Third St	Project Number: [none]	**Reported:**
Encinitas CA, 92024	Project Manager: Steve Dickey	01/21/16 10:00

Volatile Organic Compounds by EPA Method 8260B - Quality Control

Sierra Analytical Labs, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B6A1404 - EPA 5030B P & T										
Blank (B6A1404-BLK1)				Prepared & Analyzed: 01/14/16						
Isopropylbenzene	ND	1.0	µg/L							
p-Isopropyltoluene	ND	1.0	"							
Methylene chloride	ND	1.0	"							
Methyl tert-butyl ether	ND	1.0	"							
Naphthalene	ND	1.0	"							
n-Propylbenzene	ND	1.0	"							
Styrene	ND	1.0	"							
1,1,1,2-Tetrachloroethane	ND	1.0	"							
1,1,2,2-Tetrachloroethane	ND	1.0	"							
Tetrachloroethene	ND	1.0	"							
Toluene	ND	1.0	"							
1,2,3-Trichlorobenzene	ND	1.0	"							
1,2,4-Trichlorobenzene	ND	1.0	"							
1,1,1-Trichloroethane	ND	1.0	"							
1,1,2-Trichloroethane	ND	1.0	"							
Trichloroethene	ND	1.0	"							
Trichlorofluoromethane	ND	1.0	"							
1,2,3-Trichloropropane	ND	1.0	"							
1,2,4-Trimethylbenzene	ND	1.0	"							
1,3,5-Trimethylbenzene	ND	1.0	"							
Vinyl chloride	ND	1.0	"							
m,p-Xylene	ND	1.0	"							
o-Xylene	ND	1.0	"							
Surrogate: Dibromofluoromethane	*55.9*		*"*	*50.0*		*112*	*86-118*			
Surrogate: Toluene-d8	*47.8*		*"*	*50.0*		*95.6*	*88-110*			
Surrogate: 4-Bromofluorobenzene	*47.2*		*"*	*50.0*		*94.4*	*86-115*			
LCS (B6A1404-BS1)				Prepared & Analyzed: 01/14/16						
Benzene	42.7	1.0	µg/L	50.0		85.4	80-120			
Chlorobenzene	41.9	1.0	"	50.0		83.8	80-120			
1,1-Dichloroethene	49.3	1.0	"	50.0		98.6	80-120			
Toluene	48.7	1.0	"	50.0		97.4	80-120			
Trichloroethene	40.3	1.0	"	50.0		80.6	80-120			

Dudek	Project: Reuland Electric	
605 Third St	Project Number: [none]	**Reported:**
Encinitas CA, 92024	Project Manager: Steve Dickey	01/21/16 10:00

Volatile Organic Compounds by EPA Method 8260B - Quality Control

Sierra Analytical Labs, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B6A1404 - EPA 5030B P & T										
Matrix Spike (B6A1404-MS1)	**Source: 1601191-08**			Prepared & Analyzed: 01/14/16						
Benzene	44.5	1.0	µg/L	50.0	ND	89.0	37-151			
Chlorobenzene	47.5	1.0	"	50.0	ND	95.0	37-160			
1,1-Dichloroethene	43.6	1.0	"	50.0	ND	87.2	50-150			
Toluene	42.7	1.0	"	50.0	ND	85.4	47-150			
Trichloroethene	42.4	1.0	"	50.0	ND	84.8	71-157			
Matrix Spike Dup (B6A1404-MSD1)	**Source: 1601191-08**			Prepared & Analyzed: 01/14/16						
Benzene	50.3	1.0	µg/L	50.0	ND	101	37-151	12.2	30	
Chlorobenzene	40.7	1.0	"	50.0	ND	81.4	37-160	15.4	30	
1,1-Dichloroethene	44.0	1.0	"	50.0	ND	88.0	50-150	0.913	30	
Toluene	37.2	1.0	"	50.0	ND	74.4	47-150	13.8	30	
Trichloroethene	37.3	1.0	"	50.0	ND	74.6	71-157	12.8	30	

Dudek	Project: Reuland Electric	
605 Third St	Project Number: [none]	**Reported:**
Encinitas CA, 92024	Project Manager: Steve Dickey	01/21/16 10:00

Notes and Definitions

DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

CHAIN OF CUSTODY RECORD

SIERRA ANALYTICAL
TEL: 949•348•9389
FAX: 949•348•9115
26052 Merit Circle• Suite 104•Laguna Hills, CA•92653

Date: 1 / 13 / 16 Page 1 of 1

Lab Project No.: Reuland Electric

Client: Dudek
Client Address: 605 Third St.
Encinitas, CA 92240

Client Tel. No.: (760) - 214-4675
Client Fax. No.:
Client Proj. Mgr.: Steve Dickey

Client Project ID: Reuland Electric

Turn Around Time Requested: ☐ Immediate ☐ 24 Hour ☐ 48 Hour ☐ 72 Hour ☐ 4 Day ☐ 5 Day ☒ Normal ☐ Mobile

Analysis Requested

#1601191
Geotracker EDD Info:
Client LOGCODE
Site Global ID

Client Sample ID.	Sierra No.	Date	Time	Matrix	Preservative	Container Type	No. of Containers	8260	Field Point Names/ Comments
MW-9	01	1/13	1240	H_2O	HCl	VOA	2	X	
MW-8	02	1/13	1250	"	HCl	"	2	X	
MW-1	03	1/13	1310	"	HCl	"	2	X	
MW-8dup	04	1/13	1255	"	HCl	"	2	X	
Trip Blank	05	1/13	—	"	HCl	"	2	X	
MW-3	06	1/13	1550	"	HCl	"	2	X	
MW-12	07	1/13	1600	"	HCl	"	2	X	
MW-11	08	1/13	1610	"	HCl	"	2	X	

1 Sampler Signature: [signature] Printed Name: Christian Hunter
Shipped Via: drop off (Carrier/Waybill No.)

16 Total Number of Containers Submitted to Laboratory

2 Relinquished By: [signature] Date: 1/13/16 Time: 6:30
Received By: [signature] Date: 1-13-16 Time: 18:30
Company: Dudek Company: Sierra

The delivery of samples and the signature on this chain of custody form constitutes authorization to perform the analysis specified above under SIERRA's Terms and Conditions, unless otherwise agreed upon in writing between SIERRA and CLIENT. * - Samples determined to be hazardous by SIERRA will be returned to CLIENT.

3 Relinquished By: Date: Time: Received By: Date: Time: Company: Company:

16 Total Number of Containers Received by Laboratory

4 Relinquished By: Date: Time: Received By: Date: Time: Company: Company:

Special Instructions:

Sample Disposal:
☐ Return to Client
☒ Lab Disposal*
☐ Archive _____ mos.
☐ Other _____

FOR LABORATORY USE ONLY - Sample Receipt Conditions:

☒ Intact ☒ Chilled - Temp. (°C) 4.0
☐ Sample Seals ☐ Preservatives - Verified By
☒ Properly Labelled ☐ Other
☒ Appropriate Sample Container ☒ Storage Location VOA

DISTRIBUTION: White - To Accompany Samples, Yellow - Laboratory Copy, Pink - Field Personnel Copy